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PERCEIVED RISK AND MOBILE SHOPPING: DO THEY MATTER?

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Abstract:

This paper examines the relationship between six perceived risk factors and online mobile shopping behaviour among youths in Malaysia. Specifically, this study will examine the relationship between product performance risk, health risk, time risk, financial risk, security risk and social risk towards mobile shopping behaviour. This survey is based on a judgement sampling method and data collection was done using an online survey method in a local private university and the hypotheses were tested using quantitative analysis. The online survey involved a total of 383 respondents and data were processed via IBM SPSS Statistics 24 and AMOS 22. The findings revealed four perceived risk factors (product performance risk, time risk, financial risk, security risk) are significantly affecting mobile shopping behaviour while two factors (health risk and social risk) are insignificant. This study offers valuable insights to online retailers, enabling them to develop strategies that mitigate risks in the mobile shopping environment, particularly focusing on financial risk. Additionally, the study presents perspectives on various dimensions of perceived risk that hold significance for youths. These insights can prove instrumental in enhancing stakeholder engagement and facilitating the creation of effective policies and strategies for the mutual benefit of consumers and online retailers in the future.

Keywords:

Perceived Risk, Mobile Shopping Behaviour, Online Shopping, Youth, E-Commerce

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Introduction

In recent years, online buying behaviour has become an area of interest due to the rapid advancement of the internet. Asia recorded half of the worldwide internet users and more people are buying online as they can easily connect to the internet. Electronic commerce refers to transactions made using electronic devices while mobile commerce refers to transactions made using mobile devices (Lim, Yeo, & Wong, 2020). As smartphone users continue to grow in numbers, mobile shopping has become more common. Equipped with a smartphone in hand, a consumer can buy products and services at any location and any hours of the day. Other than browsing for products and services, mobile devices serve as organisers as they can download applications to serve these purposes. According to a survey by Statista (Statista, 2022), mobile shopping has seen a surge in 2020 as 80 percent of respondents shopped via smartphones. The number of shoppers using mobile is increasing due to the conveniences brought by wireless technologies and it is expected to surge in the years to come (Gregor & Kalińska-Kula, 2020).

The rapid growth of electronic commerce globally is expected to hit $2.7 trillion by the year 2023 with the East Asia region expected to be worth $100 billion by 2025 (Chen, 2020). However, this rapid growth of the internet comes with a hefty price when new challenges begin to emerge due to data security, payment security, enforcement of the electronic contract, incomplete information disclosure and local enforcement of consumer rights (Ariffin, Mohan, & Goh, 2018). Consumers perceived buying online as having higher risks as compared to buying at a brick-and-mortar shop. The sophisticated payment system and the unknown programming behind applications and websites added to the fear of consumers who bought products and services online (Chimborazo, Frasquet, & Molla, 2021). Consumers also fear losing money from online transactions as the relatively smaller screen size of mobile phones can be a hassle to consumers when searching for a suitable item and may end up buying at a higher price (Marriot & Williams, 2018).

A recent survey showed that more than half of internet users in Malaysia spend above 10 hours a day browsing the internet and 33% are between the ages of 20 to 24 years old (Internet Users Survey, 2020). Younger generations are depending more on the internet as it is part of their lifestyle. Their social lives, education, shopping, and entertainment revolve around the internet and this will cause them to be exposed to scammers. Besides, their physical and mental health may also be affected when smartphones are used obsessively (Abhishek, Sudha, & Amrutha, 2020). It is also found that some young people are overly dependent on smartphones because sustaining relationships in social media is easier than face-to-face interactions (Gentina, Chen, & Yang, 2021).

Moreover, consumers are overwhelmed by the numerous products and services found online as there are too many sellers on the internet (Amirtha, Sivakumar, & Hwang, 2020). Insufficient and inaccurate information provided by unscrupulous sellers can easily cause consumers to be misled and possibly buy counterfeit products when buying online as buyers can only depend on the information provided on the screen (Priporas, Chen, Zhao, & Tan, 2020). The Ministry of Domestic Trade and Consumer Affairs (2019) recorded more than 6000 cases of complaints regarding online purchases in the year 2019 alone and the cases are expected to increase with the increasing use of online shopping. Other than misinformation, delays in the consumption of products due to delivery may also cause reluctance to adopt buying online. Pentz, Preez, and Swlegers (2020) revealed that a greater gap between purchase and consumption time can lower satisfaction levels among youth. In cases of wrong deliveries and returns would incur an even longer time and at times additional costs to buyers and it is

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especially an issue for university or college students who have limited resources (Kumsa, Lemu, & Nguse, 2020).

Consumer perceived risk is an important area of study because mobile buying behaviour is directly affected by the level of risk gauged when buying from a virtual setting. When compared to brick-and-mortar shopping whereby consumers can see and touch the product and can immediately consume after payment, mobile shopping is perceived as a higher risk (Guru, Nenavani, Patel, & Bhatt, 2020). Perceived risk will negatively affect consumer shopping intention and behaviour. Therefore, this study assessed six risk perceptions, namely product performance risk, financial risk, social risk, health risk, security risk and time risk in terms of how it affects mobile shopping behaviour among youths.

Literature Review

There are two main points that are discussed in literature review.

Mobile Shopping Behaviour

Generally, the process of buying products and services through smartphones is categorised as mobile shopping behaviour (Yang & Kim, 2012, Lim et al., 2020). The use of mobile devices such as smartphones is growing at such a rapid pace because mobile application developers are constantly releasing new applications which also enhance the mobile shopping experience (Bhullar & Gill, 2019; Zamil, Abu-Alsondos, & Salameh, 2020). With the use of mobile application channels, customer relationship management, customers' satisfaction and the purchasing experience have been enhanced tremendously (Tseng, Lee, Huang, & Yang, 2021). Therefore, mobile shopping does not only encompass the payment stage but also includes the whole consumer purchasing process from the browsing stage until the final purchasing stage. Therefore, a proper understanding of shopping behaviour is important to be successful in the mobile shopping arena (Marriot, Williams, & Dwivedi, 2017; Chen, Ruangsri, Ha, & Widjaja, 2022). On a similar note, past researchers have also discovered that youths buy more using their mobile devices as compared to older consumers (Hubert, Blut, Brock, Backhaus, & Eberhardt, 2017; He, Li, Li, & Chen, 2020). The rationale is that youths have higher acceptance towards new technology and mobile shopping is considered a new technology (Hou & Elliot, 2021).

Table 1 shows the summary of academic definitions of mobile shopping based on past researches on mobile shopping. Based on the literature review presented in Table 1, it is evident that the definitions of mobile shopping have evolved in tandem with technological advancements. Prior to 2008, the primary usage of mobile devices was limited to conducting SMS-based transactions. However, with the progress of technology, smartphones have become versatile tools capable of performing various functions on the move. Their capabilities extend beyond solely making online payments for purchased goods and services. Hence, in order to encompass the diverse activities associated with mobile shopping, this study adopts the definition from Marriot and Williams (2018), which encompasses browsing, searching, comparing, and purchasing goods and services using mobile devices with a wireless internet connection.

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Table 1: Summary of Academic Definitions of Mobile Shopping

Author	Mobile Shopping Definition
Bigne, Ruiz and Sanz (2005)	Encompasses transactions conducted through mobile devices utilising wireless internet connectivity
Wu and Wang (2006)	Mobile shopping, as a branch of electronic commerce, encompasses financial transactions conducted through wireless networks
Jih (2007)	The act of searching, communicating, and purchasing goods and services over the internet, unrestricted by location or time constraints
Lu and Su (2009)	Encompasses the complete process of a traditional shopping experience, including activities such as product search, price and product comparison, placing orders, making payments, and even advertising, all performed using a mobile device
Ozok and Wei (2010)	Derived from e-commerce, it involves the act of shopping for goods and services using mobile devices
Yang (2010)	Engaging in online transactions through the medium of mobile shopping
Hung, Yang, and Hsieh (2012)	Engaged consumers utilising mobile devices to make payments for goods and services
Wong, Lee, Chua, Chai, and Tan (2012)	Encompasses monetary transactions occurring when purchasing goods and services through internet-enabled mobile phones, utilising wireless communication networks
Yang and Kim (2012)	Encompasses the activities of browsing, researching, and purchasing products and services while being mobile or on the move
Chen (2013)	Encompasses the activities of browsing, purchasing, and making payments for goods and services using mobile phones, smartphones, or other mobile devices
Holmes, Bryne, and Rowle (2013)	Mobile shopping extends beyond the act of buying and includes activities such as checking prices, comparing products, gathering information, and reviewing user feedback
Agrebi and Jallais (2015)	A transaction conducted through mobile devices to initiate or confirm payments for goods and services
Dogbe, Zakari, and Pesse-Kuma (2015)	Mobile shopping is defined as a transaction involving the use of mobile devices to either initiate or confirm payments for goods and services. It not only serves as an alternative method for exploring, browsing, comparing, and purchasing products and services online, but it also offers the flexibility to do so at any time and from any location
Groß (2015)	Mobile shopping encompasses the gathering of information about products and services from various sources, checking product availability, and exploring available offers. Additionally, it provides the capability to modify product selection throughout the buying process
Groß (2016)	Mobile shopping is commonly defined as the process of making purchases for goods and services using smartphones

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Natarajan, Balasubramanian, and Kasilingam (2017)	Mobile shopping includes a wide range of activities such as purchasing items, tracking order statuses, collecting rewards and loyalty points, accessing stored coupons, browsing or studying products, comparing different products, and reading reviews
Chen (2018)	Mobile shopping refers to the act of shopping through wireless-enabled mobile devices, enabling shopping to occur ubiquitously and without limitations of location
Marriot and Williams (2018)	Mobile shopping is the term used to describe the process of utilising handheld mobile devices to browse, search, compare, and ultimately purchase goods and services online.
Lissitsa and Kol (2021)	Derived from e-commerce, mobile shopping involves activities centred around buying products and services from retailers using mobile devices such as smartphones and tablets
Ertz, Jo, Kong, and Sarigöllü (2022)	Mobile shopping encompasses the activities of both browsing and purchasing goods and services using mobile devices.
Zhang, Jun, and Palacios (2023)	Mobile shopping refers to the practice of purchasing goods or services by utilising a mobile device connected to retailers through mobile or wireless networks.

Source: Develop for the present research

Perceived Risk Dimensions

The concept of perceived risk was first introduced by Bauer (1960) and was defined as "consumer's perception of the uncertainty and the possible undesirable consequences of purchasing a product or service". The focus is based on the risk perception before experience with the product and services and therefore must be considered as subjective risks (Groß, 2016). From the perspective of electronic commerce, perceived risk is the belief in the possibility of negative uncertainty when purchasing online (Ariff, Sylvester, Zakuan, Ismail, & Ali, 2014).

Consumer risk perception affects purchase behaviour negatively (Ariffin et al., 2018). According to Amirtha, Sivakumar, and Hwang (2020), consumers perceived online shopping as a higher risk as compared to traditional brick-and-mortar shopping. Tan and Ooi (2018) noted that mobile technology is perceived as a higher risk due to higher chances of cyber-attacks. Zhang, Tan, Xu, and Tan (2012) concluded that the higher the risk perception, the less likely consumers are to buy online. Cunningham (1967) classified perceived risks into performance, financial, time, safety, social and psychological loss categories and privacy risk was later added by Featherman and Pavlou (2003). Zhang et al. (2012) proposed 8 dimensions when measuring online shopping namely health risk, social risk, privacy risk, after-sales service risk, economic risk, quality risk, delivery risk and time risk. Ariffin, Mohan, and Goh (2018) proposed that perceived risk consists of financial risk, product risk, security risk, time risk, social risk and psychological risk. A recent study by Mwencha and Muathe (2019) which is also related to online purchasing included financial risk, performance risk, privacy risk, social risk and time risk as these dimensions are more influential. In this study, dimensions such as product performance risk, health risk, time risk, financial risk, security risk and social risk were tested.

Zhang et al. (2012) define product performance risk as a product's ability to operate as described to provide the expected benefits. The fear of receiving a product that may not

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function is magnified in the case of online shopping due to the inability to test the product before purchasing (Masoud, 2013). The moment of truth when customers receive faulty products may instantly cause them to regret their purchase. The health risk is defined as the possibility of affecting health due to prolonged use of electronic devices such as computers or smartphones (Zhang, Tan, Xu, & Tan, 2012). Excessive smartphone usage has caused health issues such as headaches, pain in the ear, painful fingers, difficulty in resting, neck pain, tiredness and sleep issues (Boonjing & Chanvarasuth, 2017). The inability to focus and health-related issues are all linked to addiction to mobile usage (Abhishek et al., 2020). Moreover, online shopping requires waiting as compared to brick-and-mortar shopping whereby consumers can grab the product, make the payment and enjoy the purchase immediately (Pentz, Preez, & Swingers, 2020). Time risk includes fear due to time wasted from switching to using mobile devices, resulting in more time pressures (Marriott & Williams, 2018).

Marriot and Williams (2018) defined financial risk as the possibility of losing financially due to fraud, dubious payment and undelivered goods. Online purchasing is viewed as riskier in terms of losing cash as compared to brick-and-mortar shopping (Dogbe, Zakari, & Pesse-Kuma, 2019). Arshad, Zafar, Fatima, and Khan (2015) included the concerns due to the financial loss from returning the products and paying another shipping for a replacement. Hubert, Blut, Brock, Backhaus, and Eberhardt (2017) refer to the probability of losing control of personal information as a security risk. Many shoppers are concerned about information being shared by sellers and the tracking of shopping behaviours done without permission (Chen, 2015). Zhao, Ward, and Goode (2008) proved that consumers fear losing personal information as they are fearful of losing money as a result. Social risk is defined as the probability of losing status in a social group upon adapting a product or service (Marriot & Williams, 2018). The worries consumers may have regarding the perception of reference groups towards their means of purchasing is defined as social risk (Amirtha et al., 2020).

Based on the discussion above, the following hypotheses were proposed:

H_1: Product performance risk significantly affects mobile shopping behaviour.
H_2: Health risk significantly affects mobile shopping behaviour.
H_3: Time risk significantly affects mobile shopping behaviour.
H_4: Financial risk significantly affects mobile shopping behaviour.
H_5: Security risk significantly affects mobile shopping behaviour.
H_6: Social risk significantly affects mobile shopping behaviour.

Figure 1 illustrates the research framework for this study that is built based on Theory of Perceived Risk. For this current study, six perceived risk perceptions were included namely product performance risk, health risk, time risk, financial risk, security risk and social risk as independent variables while mobile shopping behaviour as the dependent variable.

Advanced International Journal of Business, Entrepreneurship and SME's
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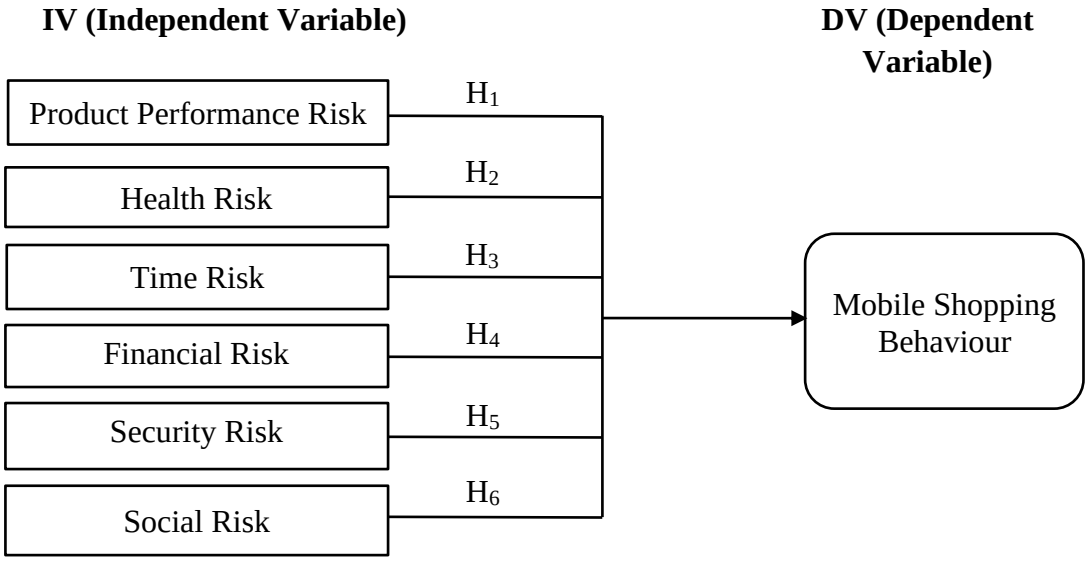

Figure 1: Research Framework

Source: Develop for the present research

Methodology and Data Collection

A total of 383 survey questionnaires were collected and analysed using IBM SPSS Statistics 26 and AMOS 22. An online questionnaire was sent to a targeted population of students in a private university in Perak. The Perak campus has over 12,000 students who are mostly aged between 18 to 23 years old at their time of study and come from different states of Malaysia, they are suitable as target respondents. Besides, the respondents are also selected based on their past experience with mobile shopping. This study uses judgement sampling and purposive sampling as past experience in mobile shopping is important to answer the survey questionnaire genuinely. The variables of the study include the following: product performance risk (five items) and health risk (five items) were adopted from Zhang et al. (2012), time risk (seven items) and financial risk (six items) were adopted from Liew, Teo, and Yap (2014), security risk (six items) were adopted from Hubert et al. (2017) and social risk (five items) were adopted from Marriot and Williams (2018). The 4 items to measure mobile shopping behaviour (MSB) were adopted from Ariff, Sylvester, Zakuan, Ismail, and Ali (2014). In order to measure the items on product performance risk (PPR), health risk (HR), time risk (TR), financial risk (FR), security (SR), social risk (SOR) and mobile shopping behaviour (MSB), a five-point Likert scale is applied from 1 representing strongly disagree to 5 as strongly agree.

Results and Discussion

A total of 383 responses were collected at the end of the survey data collection period. Respondents' profiles showed that the majority are female (61.1 per cent) as compared to men (38.9 per cent) and most of them are from the age category of 18 to 20 years old (83 per cent) which is the typical age for students to enrol in private tertiary education upon completion of secondary school. The remaining 17 per cent are above 20 years old. The majority of respondents are studying foundation level (54.8 per cent) while the remaining (45.2 per cent) are mainly studying degree programmes.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
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Volume 5 Issue 17 (September 2023) PP. 18-32
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Measurement Model Test

CFA was performed using AMOS 22 for all 38 items with 7 variables namely: product performance risk, health risk, time risk, financial risk, security risk, social risk and mobile shopping behaviour. According to the results shown in Table 2, the measurement model goodness-of-fit index is an acceptable level of 0.881, RMSEA is 0.052, TLI is 0.916, CFI is 0.926, the normed Chi-squared is 2.02 and the degree of freedom of 411. The GFI values adjusted after removing items with low factor loading and conducting the correlations of error of some items that have high modification indices are closer to the level of acceptance, even though it is slightly below the level of acceptance recommended (Awang, 2012). Therefore, it is concluded that the model fit is adequately fit and most of the threshold values are met.

Table 2: Goodness-of-fit Results for the Measurement Model

Name of Index	Index Full Name	Values		Level of Acceptance
		Before	After*	
GFI	Goodness-of-fit Index	0.82	0.881	≥ 0.9
RMSEA	Root Mean Square of Error Approximation	0.062	0.052	< 0.08
TLI	Tucker Lewis Index	0.836	0.916	≥ 0.9
CFI	Comparative Fit Index	0.85	0.926	≥ 0.9
Chisq/df	Normed Chisq	2.491	2.02	1.0 – 5.0
Chisq	Chisquared	1604.07	828.397	
df	Degree of Freedom	644	411	

Source: Develop for the present research
Note: *Items after adjustments

Composite reliability test is employed to assess the internal reliability of the measurement model, which examines the extent to which a measurement reflects its intended outcome. This test is based on correlations between different items within the same construct. The internal consistency of the items is measured using Cronbach's Alpha, where a value of at least 0.6 is considered necessary to demonstrate internal consistency. However, the reliability of Cronbach's Alpha has been questioned by some researchers. Hence, both composite reliability and Cronbach's Alpha are utilised in this study.

Table 3 presents the results of the measurement model, indicating that all constructs have composite reliability values above the threshold of 0.6, thus confirming the reliability of the measurement model. The composite reliability are product performance risk (0.800), health risk (0.857), time risk (0.741), financial risk (0.801), security risk (0.893), social risk (0.821), and mobile shopping behaviour (0.821). Furthermore, Cronbach's Alpha scores are utilised to measure the internal reliability of the measurement model. Table 3 displays the Cronbach's Alpha scores for each construct, which are product performance risk (0.817), health risk (0.857), time risk (0.768), financial risk (0.809), security risk (0.890), social risk (0.806), and mobile shopping behaviour (0.751). All Cronbach's Alpha values exceed the recommended threshold of 0.6, indicating the reliability of the measurement model.

Convergent validity is assessed using Average Variance Extracted (AVE), which measures the extent to which a measure correlates positively with alternative measures of the same construct. The AVE values of the constructs, as shown in Table 3 are product performance risk (0.504), health risk (0.690), time risk (0.501), financial risk (0.502), security risk (0.586), social risk (0.549), and mobile shopping behaviour (0.541), all of which surpass the acceptable threshold

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of 0.5. Overall, the measurement model demonstrates satisfactory internal reliability, as evidenced by the composite reliability, Cronbach's Alpha, and convergent validity measures.

Table 3: Convergent Validity and Reliability Tests for the Measurement Model

Construct	Cronbach Alpha (above 0.6)	Composite Reliability (above 0.6)	Average Variance Extracted (above 0.5)
PPR	0.817	0.800	0.504
HR	0.857	0.857	0.690
TR	0.768	0.741	0.501
FR	0.809	0.801	0.502
SR	0.890	0.893	0.586
SOR	0.806	0.821	0.549
MSB	0.751	0.821	0.541

Source: Develop for the present research

Structural Model Test

Structural Equation Modelling is used to identify the relationship between the constructs. The overall fit of the structural model is evaluated prior to path analysis, and the goodness-of-fit of this structural model is reasonably fit. Referring to Table 4, the values are (GFI) index of 0.874, RMSEA of 0.055, TLI of 0.894, CFI of 0.906, normed Chi-square of 2.00, Chi-square of 822.35 and degree of freedom of 411 and it is concluded that the model fit is adequately fit according to the level of acceptance (Hair, Black, Babin, Anderson, & Tatham, 2010).

Table 4: Goodness-of-fit Results for the Structural Model

Name of Index	Index Full Name	Values	Level of Acceptance
GFI	Goodness-of-fit Index	0.874	≥ 0.9
RMSEA	Root Mean Square of Error Approximation	0.055	< 0.08
TLI	Tucker Lewis Index	0.894	≥ 0.9
CFI	Comparative Fit Index	0.906	≥ 0.9
Chisq/df	Normed Chi-sq	2.00	1.0 – 5.0
Chisq	Chi-squared	822.35	
df	Degree of Freedom	411	

Source: Develop for the present research

As shown in Table 5, all the constructs showed negative effect on the mobile shopping behaviour with product performance risk beta = -0.638, health risk beta = -0.055, time risk beta = -5.715, financial risk beta = -9.768, security risk beta = -4.453 and social risk beta = -0.082. Based on the p-value obtained, most of the direct relationships are significant because the p <0.05. The p-value of H_1 is less than 0.001 and this proves that product performance risk significantly affects mobile shopping behaviour. However, H_2 has a p-value of 0.215 which means that health risk does not significantly affect mobile shopping behaviour. The p-value of H_3 is 0.010 and this proves that time risk significantly affects mobile shopping behaviour. H_4 is also supported as the p-value is 0.024 and it shows financial risk significantly affects mobile shopping behaviour. H_5 has a p-value of 0.034 which means security risk significantly affects

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mobile shopping behaviour. And finally, H_6 has a p-value of 0.063 which means H_6 is not supported and social risk does not significantly affect mobile shopping behaviour.

Table 5: The Significance of the Path Coefficients

Relationship	β	S.E	C.R	p-value	Results
H_1: PPR→MSB	-0.638	0.095	-6.729	0.000	Supported
H_2: HR →MSB	-0.055	0.044	-0.24	0.215	Not supported
H_3: TR →MSB	-5.715	2.210	-2.585	0.010	Supported
H_4: FR→MSB	-9.768	4.336	-2.253	0.024	Supported
H_5: SR→MSB	-4.453	2.101	-2.119	0.034	Supported
H_6: SOR→ MSB	-0.082	0.044	-1.859	0.063	Not supported

Source: Develop for the present research
Note: FR = Financial Risk; HR = Health Risk; MSB = Mobile Shopping Behaviour; PPR = Product Performance Risk; SOR = Social Risk; SR = Security Risk; TR = Time Risk; β = Beta; S.E = Standardised Estimates; C.R = Critical Ratio.

Based on the results from the data analysis, the hypotheses testing summaries are shown in Table 6:

Table 6: Hypotheses Testing Summary

Hypotheses	Direct Relation	Supported by the data
H_1	Product performance risk significantly affects mobile shopping behaviour.	Yes
H_2	Health risk significantly affects mobile shopping behaviour.	No
H_3	Time risk significantly affects mobile shopping behaviour.	Yes
H_4	Financial risk significantly affects mobile shopping behaviour.	Yes
H_5	Security risk significantly affects mobile shopping behaviour.	Yes
H_6	Social risk significantly affects mobile shopping behaviour.	No

Source: Developed for the present research

Conclusions and Recommendations

The purpose of this study is to determine the factors that affect mobile shopping behaviours among consumers. This study examined the relationships between the different facets of perceived risks, namely product performance, health risk, time risk, financial risk, security risk and social risk towards consumers' mobile shopping behaviour. The different risk perceptions are hypothesised to significantly affect mobile shopping behaviour (H_1, H_2, H_3, H_4, H_5, H_6). It is found that only four factors have a significant effect on mobile shopping behaviour, namely product performance, time risk, financial risk and security risk. However, two factors which are health risk and social risk are considered as insignificant in affecting the consumers' mobile shopping behaviour.

The findings of the study suggest that consumers' mobile shopping behaviour is affected by perceived risk. Four factors that are found to be significant are product performance, time risk,

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financial risk and security risk. Product performance risk has been the major concern of mobile shoppers because buyers are unable to examine, touch or feel the product before purchasing them as compared to buying in physical shops. Thus, it increases the risk perception of mobile shoppers in a few areas such as fear of getting a product that does not meet their expectations and ultimately having to bear the cost of their mishap, which relates to financial risk perception. Therefore, online retailers can offer 15 to 30 days of free returns to their consumers to build their trust and to reduce product performance and financial risk perception. Time risk is associated with the time wasted in delivery or exchange, online retailers can offer same-day delivery to buyers within the same vicinity, with a token charge. In order to encourage consumers to sacrifice instant gratification, online retailers need to be more competitive by offering more discounts and price reductions to attract customers.

Security risk perception relates to the fear of losing sensitive personal information while making mobile transactions to purchase online. To build confidence, online retailers can ensure better and more secure payment systems for their customers. Although health risk is considered insignificant in affecting mobile shopping behaviour, it is still a notable finding as many are not aware of the health risk associated with the higher usage of mobile shopping. Past researchers have proven the usage of mobile devices affects sleep (Haripriya, Preetha, & Devi, 2018) and it is important to educate the general public about the health risk of mobile device usage. Social risk is also another factor that is considered as insignificant in this study mainly because mobile shopping is not perceived as a social activity among undergraduates in Malaysia.

However, it is known that all studies are not without limitations. The current study does not include the moderating effect based on age or gender which may offer different results. Future studies may include these factors in the model to observe the influence of the independent and dependent variables.

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