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Critical factors that drive and influence consumer intentions to use m-commerce in retail stores in South Africa

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Critical factors that drive and influence consumer intentions to use m-commerce in retail stores in South Africa

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business

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ABSTRACT

With the growing popularity of smartphones, new opportunities in m-commerce are emerging, and these are facilitated by technological developments in internet access as well as easy access to mobile applications. However, even with these developments in technology, m-commerce adoption in South Africa is still slow.

This study examined the factors that influence and/or inhibit South African consumers from adopting m-commerce, with a specific focus on the retail sector, by extending TAM.

This study adopted a quantitative research methodology, and data was collected from 806 respondents through a web-based cross-sectional survey. Only 699 of the surveys were completed and therefore used for further analysis. The data was analysed by employing Factor Analysis, specifically, principal components analysis. Correlations analysis was used as an initial test of the hypotheses and thereafter, a multiple regression was run and used to accept or decline the hypotheses formally.

The findings revealed that perceived usefulness, perceived ease of use, social norms, self-efficacy and trust positively and significantly affect consumers' intentions to adopt m-commerce. Perceived usefulness was found to be the most significant determinant for m-commerce adoption. Perceived risk was found to have no effect on South African consumers' intentions to adopt m-commerce.

Therefore, perceived usefulness, perceived ease of use, social norms, self-efficacy and trust are the critical factors required to drive m-commerce adoption. As retailers, marketers and developers begin to develop successful m-commerce strategies, it is important that they take into consideration these factors to ensure consumers adopt m-commerce, specifically focusing on perceived usefulness.

Key concepts: m-commerce, m-shopping, e-commerce, retail, technology adoption, TAM, Technology Acceptance Model.

DECLARATION

I, Millicent Raikane, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Millicent Raikane Signature:

Signed at ……

On the …….. day of …… 20…..

DEDICATION

This thesis is dedicated to my beautiful daughter Tswelopele Tshenolo Raikane. We did it baby girl, from feeling your kicks in my belly during lectures, to working through this research paper throughout your newborn days… And now, you're 7 months and we're finally done! This one is for you. On days I wasn't sure I'd ever complete this research in time, you're babbles and giggles kept me going.

This is also dedicated to my loving husband Thato. You know how much I have longed to type this dedication, without your constant support and encouragement, we wouldn't be here. Thank you for holding the space and creating an environment that's enabled me to pursue all my dreams and ambitions.

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I am grateful to God for seeing me through this degree. Juggling a promotion, a pandemic, a pregnancy, a baby and a marriage amongst other things has stretched me in ways I never imagined possible – but as always, God pulled through.

I would like to thank my loving husband who has been a constant source of support and encouragement. My supervisor for always availing herself to provide me with guidance and direction, and for motivating me to keep going. Lastly, my employer for funding my studies.

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CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

This quantitative study examined the factors that influence and/or inhibit consumers from using m-commerce, specifically m-shopping applications in the South African retail sector, by employing the technology acceptance model and additional constructs, such as perceived risk, trust, social norms and self-efficacy.

1.2 Context of the study

This section begins by defining mobile commerce and its unique characteristics and then provides a background into online retail in South Africa. It then examines recent m-commerce developments in South Africa and other countries and demonstrates past performance and future growth prospects. The section employs past literature, as well as online statistics to ultimately frame the context in which the study is conducted.

Early developments in personal computers and the internet presented opportunities for e-commerce in the 1990s and early 2000s (Chong, Chan, & Ooi, 2012; K. C. Yang, 2005). These opportunities were mainly in the music and travel industries, where the business models were seriously disrupted (Chong et al., 2012). In the retail sector, these opportunities took the form of consumers shopping online as opposed to traditional brick-and-mortar stores. E-commerce presented advantages over traditional forms of commerce, such as convenience, wider product selection, efficiency, reasonable pricing, variety and quality information (Wu & Wang, 2005).

With the growing popularity of smartphones and improved access to data technologies like 3G, new opportunities emerged in the form of mobile commerce, a subset of e-commerce. These opportunities were further facilitated by developments in technology, such as declining internet access costs and easy access to mobile apps (AlHinai, Kurnia, & Smith, 2010; Yadav, Sharma, & Tarhini, 2016; Zhang, Zhu, & Liu, 2012).

Mobile commerce, hereafter m-commerce, can be defined as business activities and transactions accomplished through wireless communication networks and devices such as mobile devices (Zhang et al., 2012). While e-commerce advantages are well-documented, m-commerce offers unique advantages over e-commerce, such as personalisation, instantaneity, localisation, identification and ubiquity (Chong et al., 2012; Zhang et al., 2012).

In recent years, South Africa has seen a great improvement in 3G coverage, internet penetration and smartphone adoption (ICASA, 2020; Statista, 2020). National population coverage for 3G has tracked well above 97.8% since 2015, currently sitting at 99.7% as of 2019. Meanwhile, the higher speed 4G/LTE coverage has increased substantially from 53% in 2015 to 92.8% in 2019 (ICASA, 2020). The province with the lowest 4G rural population coverage was the Northern Cape, with a coverage of 72% and 97% for 3G. Internet penetration was 63.8% in 2018 and is forecast to reach 80.8% in 2023, while the share of the population with smartphones was 35% in 2018 and is projected to be 43% in 2023 (Statista, 2020). These are encouraging statistics, and they demonstrate that the South African retail industry is well-positioned to benefit from e-commerce and m-commerce, respectively.

In South Africa, online retail accounts for only 1.4% of total retail sales compared to China, where online retail accounted for 19.6% of total retail sales in 2017 (WorldWideWorx, 2019). Africa, as a continent, accounts for less than 1% of global retail sales while the US, on its own, has a share of the global e-commerce market averaging 20% (WorldWideWorx, 2019). These figures suggest that South Africa, and Africa at large, still lag on e-commerce and consequently m-commerce, compared to other western and eastern countries as well as other continents.

Unlike the more developed markets, such as the European Union, in 2017, 68% of the internet users made an online purchase, the corresponding figure was only 13% for Africa in the same year (UNCTAD, 2018). It is estimated that there were fewer than 2% online shoppers in Africa in 2017, and three countries together accounted for almost half of them, namely, South Africa, Nigeria and Kenya (UNCTAD, 2018). The flip side is that the prospects are starting to look better.

Since 2014, the number of online shoppers in Africa has been rising annually by 18%, which is higher than the average global growth rate of 12% (UNCTAD, 2018).

In South Africa, the annual growth rate of online retail was 25% in 2018, higher than the predicted 20% (WorldWideWorx, 2019). This is a positive indicator that e-commerce and m-commerce alike are beginning to gain momentum in South Africa, and this is evident in the performance of South Africa's leading online store, Takealot.com, which grew by 31% year-on-year in 2019 and the online fashion site, Superbalist which grew by 80% in 2019, post the merger with Spree in October 2018 (Naspers, 2019).

1.3 Research problem

3G coverage in South Africa is tracking well above 99%, internet penetration is forecast to exceed 80% in 2023, and smartphone adoption continues to rise (ICASA, 2020; Statista, 2020). However, online retail still only accounts for 1.4% of total retail sales in South Africa (WorldWideWorx, 2019). Therefore, it is evident that there are plenty of opportunities to scale m-commerce in South Africa. However, it is important to note that although all the above-mentioned facilitators may be in place, the adoption of m-commerce from a consumer point of view is not guaranteed. Even with increasing subscriber numbers, actual m-commerce activities in some developing countries have remained low (Chong et al., 2012). Only 4% of South Africans are regular online shoppers (WorldWideWorx, 2019).

Thus, while structurally, South Africa may be positioned to leverage m-commerce, current adoption by consumers remains sub-par. This is particularly a challenge because for m-commerce to succeed, both retailers and consumers need to be active participants. Therefore, retailers must understand the factors that influence consumers to use m-commerce and take those insights into account when designing the customer experience.

In evaluating whether to embark on an omnichannel strategy inclusive of m-commerce as a channel or simply using m-commerce as the only channel, retailers need to have a clear understanding of the consumers for whom they

intend building the m-commerce platform and what those consumers are driven by to use the platform. The risk retailers face by designing platforms without the consumer in mind include financial risks, where retailers invest large amounts of money and resource capacity for initiatives that do not yield an acceptable return on investments. Another risk is the reputational risk, where customers have negative experiences on the platform and no longer return, and worse, give reviews to other customers about those negative experiences.

Thus, this research examined the factors that influence the consumer to adopt m-commerce and purchase on m-commerce platforms, with the ultimate goal of increasing the adoption of m-commerce by South African consumers.

1.4 Research objectives

In an attempt to address the research problem that this study sought to resolve and having been informed by preliminary literature on m-commerce adoption, the following guiding research objectives were adopted:

- To examine the relationship between technology adoption and South African consumers' intentions to use m-commerce
- To examine the role that social influence had on the consumers' intention to adopt m-commerce.
- To examine the role that self-efficacy had on the consumers' intention to adopt m-commerce.
- To examine the extent to which perceived risk deterred consumers from adopting m-commerce.
- To examine the role that trust played in consumers' intentions to adopt m-commerce.

1.5 Significance of the study

The increasing levels of smartphone adoption, accompanied by the high levels of 3G coverage and internet penetration (ICASA, 2020; Statista, 2020), present significant opportunities for South African retailers to scale m-commerce. Chong et al. (2012) affirm that given the high number of people with access to mobile

phones, the current potential for m-commerce far exceeds that of e-commerce, and that developing countries present a market that has potential for e-commerce (Chong et al., 2012). Thus, given the opportunity size of m-commerce, this study sought to help retailers gain insight into what drives consumers to adopt m-commerce. This will ultimately provide management with great insights into developing effective strategies that will enable retailers to be competitive in the m-commerce space (Wu & Wang, 2005).

In addition to this, this study contributes to the body of knowledge on m-commerce adoption by South African consumers by understanding how South African consumers differ from consumers in Asian countries or the United States of America (USA), where consumer adoption of m-commerce is high. This was done by using a questionnaire, which adopted constructs and questions from prior studies, modifying them to suit the context of this specific study. Although some studies have been conducted to understand the drivers for e-commerce adoption, many of these have focused on Asian countries (Khalifa & Shen, 2008b; J. Sun & Chi, 2018; Yadav et al., 2016; K. C. Yang, 2005; Zhang et al., 2012), and the research remains scant in the South African and African contexts. Thus, this research adds value to the existing literature by filling a part of the gap and opening up opportunities for further research into the field. By understanding the factors that influence consumer adoption of m-commerce in the South African retail context, South African retailers can be much more aggressive in their investments towards m-commerce because of the prospects of better returns on investments.

1.6 Delimitations of the study

This study only focused on the adoption of m-commerce within retail, i.e. m-shopping and not on other types of m-commerce, such as mobile payments, mobile banking, mobile ticketing, etc. Further to this, the study looked at m-commerce in the form of mobile shopping applications, and shopping through the web on a mobile phone was excluded from the scope of this research. The study

predominantly focused on university students, and most of the respondents were based in Gauteng. Minors and pensioners were excluded from the study.

1.7 Assumptions

In conducting this research and analyzing the results that emanated from the survey, the following was assumed:

- All respondents own a mobile device which has the functionality of downloading m-commerce applications.
- All respondents can afford to make purchases of some sort, and that the reason for non-adoption is not due to financial constraints.
- All respondents have a sufficient level of literacy required to make use of mobile shopping apps.
- M-commerce in South Africa is still in its infancy.
- Younger respondents are more technologically savvy and as a result, are more likely to adopt m-commerce

1.8 Structure of report

Chapter 1: highlights the purpose of the study and provides the context through which the study is conducted. Thereafter, it details the research problem as well as the research objectives that guide the study. The chapter then highlights the significance of the study and the delimitations, followed by the assumptions underpinning the study and lastly, some key terms are defined.
Chapter 2: defines and gives an overview of m-commerce. Thereafter, it provides a review of traditional adoption theories, namely, TAM and TPB, and the other constructs that have been used extensively in prior research, namely self-efficacy, perceived risk and trust. Each section is followed by the respective hypotheses that are adopted for this study. Thereafter the theoretical framework is developed.

Chapter 3: provides an overview of the research approach adopted as well as the research design of this study. This is followed by a description of the data

collection process and the sampling framework used. It then details the research instrument used and further describes how the data is analysed and interpreted. The chapter then highlights the study's limitations and some considerations to ensure that the research is conducted in an ethical manner.

Chapter 4 focuses on the presentation of the results and begins by outlining the profile of the respondents, covering the respondent's demographics as well as their usage behaviour. This is followed by the presentation of the results of the measurement scale, where the validity and reliability test results are presented. Thereafter, the results of the correlations analyses are presented and lastly, the results of the regression analyses.

Chapter 5: provides a detailed discussion of the results. The results are discussed for each of the constructs: perceived usefulness, perceived ease of use, social norns, self-efficacy, perceived risk and trust. The discussion covers the main findings emanating from the research and how these findings compare to past literature, providing a conclusion and a recommendation for each of the constructs.

Chapter 6: concludes the research and provides recommendations. This chapter begins by summarising the respondents' profile and thereafter highlights some conclusions as they relate to the study's research objectives. This is followed by some recommendations for key stakeholders and an overview of the contribution that this study could add to m-commerce research. Lastly, the chapter provides suggestions for future research and an overall conclusion.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter reviews current and past literature and provides a general overview of mobile commerce adoption research. In reviewing the literature, theoretical perspectives are presented, key constructs are defined, and the respective hypotheses developed. This chapter begins with a brief introduction of m-commerce, followed by the theoretical background underpinning the study. Thereafter, key constructs are defined, and the respective hypotheses developed. Lastly, the research model is defined.

2.2 M-commerce

Mobile commerce or m-commerce refers to direct and indirect monetary transactions implemented via wireless telecommunication networks or a mobile device such as a smartphone (AlHinai et al., 2007; Ko et al., 2009). M-commerce is emerging as a new business phenomenon with the growing popularity of mobile devices and tablets, access to advanced new technologies, such as 3G and the internet of things, decreasing internet access costs and easy access to mobile phone applications (Yadav et al., 2016; Zhang et al., 2012). The increasing penetration rate of mobile devices, specifically smartphones, suggests that there are opportunities for the m-commerce market.

These days, mobile devices are no longer treated as just a device to make and receive calls, chat or simply send SMSs. They are emerging as the primary means by which people connect to the internet and access internet enabled services (Yadav et al., 2016). The mobile device has, over the years, developed into a device that expedites the process of selling and purchasing goods and services, conducting financial and banking transactions, paying utility bills, mobile ticketing, social media activity and other forms of sharing content, finding the location of a place and other location-based services (AlHinai et al., 2007; Khalifa & Shen, 2008a; Yadav et al., 2016; Zhang et al., 2012). Thus, m-commerce uses

a mobile device to fulfil any of these transactions (Khalifa & Cheng, 2002; Yadav et al., 2016).

Zhang et al. (2012) and other authors identified the main advantages of using m-commerce: instantaneity, personalisation, ubiquity, localisation, and identification (AlHinai et al., 2007; Chong et al., 2012).
M-commerce is often mistaken for other information technologies such as mobile information and e-commerce. Frolick and Chen (2004) caution against confusing m-commerce with mobile information, defining mobile information as the process of providing information between a company and customer or employee via data communication.

The impact of m-commerce on businesses has been profound, with business models in some industries, such as retail and entertainment, being disrupted (Chong, 2013). In retail industries, m-commerce has led to a shift in shopping behaviour and preferences from brick-and-mortar stores to mobile shopping applications. Some researchers posit that m-commerce has the potential to have a greater impact on business communities and industries than what e-commerce did in the late 1990s and early 2000s (Chong et al., 2012), and this is mainly because the benefits offered by m-commerce outweigh those of e-commerce and include ubiquity, immediacy and any time, anywhere access (Yadav et al., 2016). However, other researchers have found transacting goods and services through mobile devices to be subpar (Wei, Marthandan, Chong, Ooi, & Arumugam, 2009).

2.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) is a theory that was developed by Davis (1989) to predict and explain the acceptance and use of information technologies (Venkatesh & Davis, 1996). It seeks to understand what causes people to accept or reject information technology. Davis (1989) posits that people tend to use or not use a system or application to the degree that they believe it will assist them with performing their job better. This is the first variable, and it is referred to as perceived usefulness. The second variable, perceived ease of use

extends that, even though an application may be useful to perform a job, it may be difficult to use and the difficulty of using it may outweigh the benefit of getting the job done. Thus, usage is theorised to be influenced by both perceived ease of use as well as perceived usefulness (Davis, 1989).

Perceived usefulness is defined as the extent to which a user believes that making use of a system will improve their job function (Davis, 1989), while perceived ease of use is defined as the extent to which a person perceives that making use of a system will be effortless (Davis, 1989). The TAM theory has been adopted from the Theory of Reasoned Action. According to TAM, other things being equal, perceived ease of use influences perceived usefulness (Venkatesh & Davis, 2000). Figure 2-1 depicts TAM.

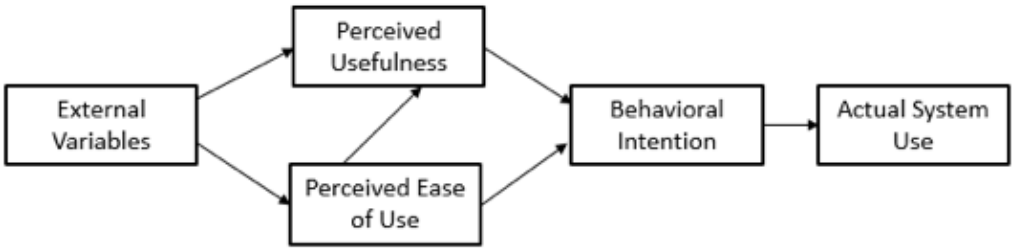


Figure 2-1 Technology Acceptance Model (TAM) (Venkatesh & Davis, 1996)

TAM has been empirically tested over the years, and it has become well-established as a robust, powerful and parsimonious model for predicting user acceptance (Venkatesh & Davis, 2000). It has been widely used in past literature to understand m-commerce adoption (Q. Sun, Wang, & Cao, 2009; Wang, Lin, & Luarn, 2006; Wei et al., 2009; Yadav et al., 2016), and while it has proven to be a good model for understanding IT adoption, some authors argue that it is not sufficient on its own to offer a comprehensive explanation of m-commerce adoption (AlHinai et al., 2007). It has often been used in conjunction with other technology acceptance models such as Rogers`s Innovation Diffusion Theory (Zhang et al., 2012), and the Theory of Planned Behaviour (Q. Sun et al., 2009) and has been extended by adding additional dimensions.

Hung, Chou, Chung, and Dong (2010) extended TAM by adding Hofstede's cultural dimensions as modulators, arguing that traditional IT acceptance models concentrate on function-driven intention rather than on understanding drivers of consumer choices. In another study, Ko et al. (2009) extend TAM by adding affective motivations such as enjoyment, arguing that most studies using TAM only focus on cognitive (extrinsic) motivations. AlHinai et al. (2007) also argued that the role played by m-commerce users is very different to that played by traditional technology users, and because traditional adoption models like TAM seek to understand consumers' intentions to adopt m-commerce based solely on the roles played by traditional technology users, neglecting the unique roles played by m-commerce users, this renders TAM as insufficient to be used on its own (AlHinai et al., 2007).

Numerous other studies have extended TAM and included other constructs such as social norms (Chong et al., 2012; Lai & Lai, 2014; J. Sun & Chi, 2018), perceived risk (Kim, Ferrin, & Rao, 2008; Zhang et al., 2012), trust (Chong et al., 2012; Yadav et al., 2016), and other constructs. This research follows the approach adopted in previous literature by extending TAM.

2.3.1 Perceived usefulness

Perceived usefulness, as a construct adopted from the Technology Acceptance Model (TAM), refers to a consumer's belief that using a certain IS/IT system will enhance their job performance. Davis (1989) found Percieved Usefulness to positively and significantly affect consumers' intention to use a technology application.

There is extensive research on technology adoption that provides evidence of the significant effect of perceived usefulness on intention to use a system (Venkatesh & Davis, 1996, 2000; Wang et al., 2006; Wei et al., 2009; Zhang et al., 2012). Some research suggests that perceived usefulness is the most important factor for predicting behavioural intention (Khalifa & Shen, 2008b). Wei et al. (2009) allude that besides just assessing the extrinsic traits of m-commerce, this

construct also demonstrates how m-commerce can help users achieve task-oriented goals such as efficiency and effectiveness. This is aligned with Khalifa and Shen's (2008b) suggestion that the utilitarian value mainly determines an individual's adoption decision.

Yadav et al. (2016) purports that the more a system is perceived to be useful, the more likely it is to be adopted and based on the original study conducted by Davis (1989), as well as numerous other studies that examined the effect of PU on consumers' intention to use m-commerce (Wang et al., 2006; Wei et al., 2009; Yadav et al., 2016), the following is hypothesised:

2.3.2 Hypothesis 1

H1: Perceived usefulness will have a positive impact on a consumer's intention to adopt m-commerce.

2.3.3 Perceived ease of use

Previous literature on the adoption of m-commerce has shown conflicting results on the impact of perceived ease of use on intention to use. While some literature suggests that perceived ease of use is significantly linked to intention both directly and indirectly (Davis, 1989; Venkatesh & Davis, 2000), some studies have found the relationship between the same variables to be insignificant (Chong et al., 2012), others just marginally significant (Wang et al., 2006). Yadav et al. (2016) posit that the more complex a system, the less the intention to adopt m-commerce; this did not hold true in countries where consumers were more technologically savvy.

A study conducted in Taiwan found that perceived ease of use was only marginally significant because of the great popularity of mobile phone usage and a high self-efficacy towards m-service systems (Wang et al., 2006). Similarly, in Malaysia and China, the influence of perceived ease of use on intention to use was found to be insignificant (Wei et al., 2009). Consumers in these countries are

familiar with using their mobile phones and as such, technology ease of use did not influence their decision to use a system (Chong et al., 2012; Wei et al., 2009).

The correlation between perceived ease of use and perceived usefulness is found to be significantly positive (J. Sun & Chi, 2018; Wang et al., 2006). According to TAM, perceived usefulness is also influenced by perceived ease of use (Davis, 1989). Venkatesh and Davis (2000) posit that all things being equal, the less effort a system requires to operate, the more using it is can increase job performance.

Wang et al. (2006) found that systems that are easy to use lead to the creation of trust, suggesting that although perceived ease of use may not influence intention to use in some instances, it can increase the level of trust consumers have towards the system (Gefen, Karahanna, & Straub, 2003). Given the above findings, the following hypotheses are proposed:

2.3.4 Hypothesis 2

H2a: Perceived ease of use will have a positive effect on a consumer's intention to adopt m-commerce.

H2b: Perceived ease of use will have a positive effect on the consumer's perceived usefulness of m-commerce

H2c: Perceived ease of use will have a positive effect on a consumer's trust towards m-commerce

2.4 Theory of Planned behaviour

The theory of planned behaviour is another well-known theory used in technology acceptance studies. It is an extension of the original theory of reasoned action, which had limitations in predicting behaviours over which people did not have complete volitional control (Ajzen, 1991; Khalifa & Shen, 2008a). Similar to the theory of reasoned action, the individual's intention to perform a specific

behaviour is a central factor in the model. It signifies how hard people are willing to try in order to perform the behaviour (Ajzen, 1991).

Ajzen (1991) extended TRA by including an additional construct, “perceived behavioural control” to account for the availability of cognitive and situational resources required to perform a behaviour (Q. Sun et al., 2009) and as a determinant of both intention and behaviour (Khalifa & Shen, 2008a; Q. Sun et al., 2009). According to the theory of planned behaviour, behavioural intention is determined jointly by attitude, subjective norms and perceived behavioural control (Ajzen, 1991; Khalifa & Shen, 2008b; Zhang et al., 2012). Figure 2-2 depicts the Theory of planned behaviour.

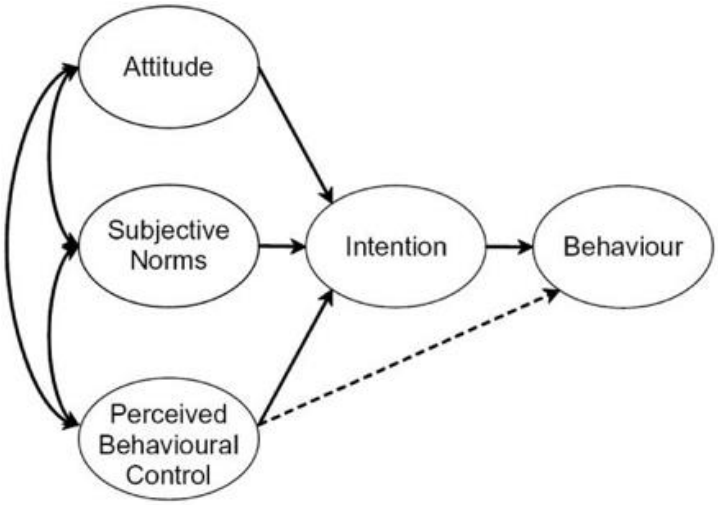


Figure 2-2 Theory of planned behaviour (Ajzen, 1991).

Attitude toward the behaviour is defined as the degree to which a person has a favourable or unfavourable evaluation or judgement of the behaviour in question (Ajzen, 1991), and they are influenced by one of three salient behaviours, namely, behavioural beliefs. The second construct, which is influenced by normative beliefs, is a social factor, and it refers to the perceived social pressure to perform or not perform a specific behaviour (Ajzen, 1991). The third construct refers to the perceived ease or difficulty of performing the behaviour in question and is referred to as perceived behavioural control (Ajzen, 1991). It is influenced by control beliefs. TAM and TPB's main difference is that TPB focuses on external factors while TAM only focuses on users’ internal perceptions (Zhang et al., 2012).

The theory of planned behaviour has been relied upon extensively in m-commerce consumer adoption research, with studies ranging from using the model as the primary theoretical framework (Khalifa & Shen, 2008a, 2008b) to some using just one or more of the three main constructs to extend other models such as TAM (Q. Sun et al., 2009; Zhang et al., 2012). In this study, the latter approach wis followed, and social norms is the only construct that is adopted from TPB.

2.4.1 Social Norms

Social norms was not included in the original TAM model because Davis (1989) found that the correlation between social influence and the behavioural intention was not significant. however, as many studies started to prove the significance of social norms, Venkatesh and Davis (2000) reconsidered its role in TAM and found that it influenced perceived usefulness and behavioural intention (Zhang et al., 2012). These findings have been consistent with other studies' findings (Chong et al., 2012; Khalifa & Shen, 2008b; Yadav et al., 2016). These consistent findings highlight the important role of family, friends and celebrities in influencing consumers to adopt m-commerce (Yadav et al., 2016). According to Venkatesh and Davis (2000), people internalise the opinions of those referents they deem important to them, and they adopt those opinions into their belief structures, which is how the direct effect of the two variables is realised. Yadav et al. (2016) found that social influence emerged as the second most important determinant of m-commerce adoption; therefore, the following hypothesis is adopted:

2.4.2 Hypothesis 3

H3a: Subjective norms will have a positive effect on a consumer’s intention to adopt m-commerce.

H3b: Subjective norms will have a positive effect on the consumer’s perceived usefulness of m-commerce.

2.4.3 Self-efficacy

Self-efficacy refers to an individual's judgement of their ability to use m-commerce (Q. Sun et al., 2009). Hossain, Islam, Khan, and Ramayah (2011) postulate that consumers who deem m-commerce as too complex and believe they do not have what it takes to engage in m-commerce will avoid using it (Hossain et al., 2011).

Several studies have examined the relationship between self-efficacy and consumers' intentions to use m-commerce (Khalifa & Shen, 2008b; Q. Sun et al., 2009; Wang et al., 2006), and found that the relationship between self-efficacy and consumer intention to use is significantly positive. This means that consumers are likelier to adopt m-commerce when they perceive that they have sufficient ability and skills required to engage in m-commerce transactions.

Further to this, self-efficacy is expected to affect perceived ease of use. Since self-efficacy refers to one's judgement of one's own abilities to use m-commerce, this suggests that consumers who believe that they have sufficient abilities to use m-commerce, would not be concerned about the ease of use of the system in question. Khalifa and Shen (2008a) found that when self-efficacy was included in the research model as a direct antecedent of intention to use and Perceived Ease of Use, the significance of Perceived Ease of Use on Intention to Use ceased. Therefore, the following hypothesis is adopted.

2.4.4 Hypothesis 4

H4a: Self-efficacy will have a positive effect on a consumer's intention to adopt m-commerce.

H4b: Self-efficacy will have a positive effect on the consumer's perceived ease of use of m-commerce

2.5 Perceived Risk

The inherent nature of e-commerce and m-commerce warrants that customers will always experience some level of uncertainty or concern when considering these platforms (Kim et al., 2008). These concerns that customers have over m-commerce transactions can be collectively termed as consumer perceived risk (Hong & Cha, 2013). The consumer perceives some level of risk because before making a purchase, they are uncertain whether the planned purchase will be successful or not (Hong & Cha, 2013). Featherman and Pavlou (2003) posit that perceived risk is commonly thought of as the feeling of uncertainty regarding possible negative outcomes of using a product or a service.

Zhang et al. (2012) defined perceived risk as to certain types of financial, social, psychological, physical, or time risks when consumers make transactions online.

Perceived risk is a construct with multiple dimensions. Chiu, Wang, Fang, and Huang (2014) focused on just four of the dimensions in their study: financial risk, which refers to the likelihood of suffering a financial loss due to hidden costs, maintenance costs, transaction costs, etc. Secondly, performance risk refers to the likelihood of a purchased product resulting in failure to perform as desired. Thirdly, privacy risk refers to the possible loss or exposure of one's personal information and product delivery risk, which refers to loss suffered due to the seller failing to deliver the purchased product (Chiu et al., 2014). Similarly, other authors identified similar risk dimensions: fraud risk, product quality, and product delivery (Wu & Wang, 2005). Featherman and Pavlou (2003) found that performance-related risks, classified as time risk, privacy risk, and financial risk, are the most salient concerns for the e-commerce and m-commerce context.

A consumer who perceives there to be high risk of engaging in m-commerce is likely to foresee a great possibility for loss and therefore places little trust in the service provider (Hong & Cha, 2013). A consumer's perceived risk is an important barrier for consumers considering whether to engage in m-commerce activities (Kim et al., 2008). Compared to traditional shopping methods, making m-commerce transactions may present the consumer with an overwhelming sense of risk. Traditional brick-and-mortar retail stores reduce the amount of perceived

risk because a consumer can walk into the store and touch, feel and even try the product before deciding whether or not to purchase the product (Kim et al., 2008). In contrast, when shopping on a mobile application or online, a consumer would be required to provide personal information like credit card details, address, telephone number, and the consumer can only hope that the transaction will be processed and delivered successfully and that their personal information will not be used for other purposes (Kim et al., 2008). Such risk is likely to influence whether a consumer chooses to trust and engage with the seller through m-commerce.

2.5.1 Hypothesis 5

H5: Perceived risk will have a negative effect on a consumer's intention to adopt m-commerce.

2.6 Trust

Trust is defined as the consumer's belief that a merchant will not act opportunistically and that the e-commerce or m-commerce environment is secure enough to provide risk-free transactions (Hong & Cha, 2013). Other authors have defined trust as the degree to which a consumer perceives that using m-commerce poses no privacy threats and is secure (Zhang et al., 2012). Chong et al. (2012) defined it as users' willingness to become vulnerable to the m-commerce providers after considering their characteristics.

Trust affects consumer behaviour and determines whether consumers adopt a technology or not (Wei et al., 2009), and it becomes a critical strategy for dealing with the uncertainty inherent in m-commerce (Kim et al., 2008). In traditional brick-and-mortar retail, the salesperson is the most important source of trust (J. Sun & Chi, 2018). However, because in m-commerce, the salesperson is replaced by help buttons and search features, building trust in this context becomes more difficult due to the lack of a salesperson (J. Sun & Chi, 2018). The presence of trust implies the acceptance of a reasonable amount of risk when the outcome expected is positive (Hong & Cha, 2013).

Kim et al. (2008) posit that three characteristics can be used to represent the perceived trustworthiness of the trustee or vendor, namely ability, benevolence and integrity. Kim et al. (2008) rationalise that if the consumer perceives the vendor's ability, benevolence and integrity is sufficient, the consumer will develop trust towards the vendor, and if the level of trust surpasses the level of perceived risk, then the consumer will engage in a risky relationship with the vendor (Kim et al., 2008). Therefore, trust is a key determinant to getting consumers to trust m-commerce, given the levels of perceived and inherent risks m-commerce presents.

2.6.1 Hypothesis 6

H6a: Trust will have a positive effect on a consumer's intention to adopt m-commerce.

H6b: Trust will have a positive effect on a consumer's perceived risk towards the adoption of m-commerce.

H6a: Trust will have a positive effect on a consumer's perceived usefulness of adopt m-commerce.

2.7 Theoretical framework

TAM is one of the most commonly used technology adoptions models, and it has been applied extensively in m-commerce studies (Hung et al., 2010; Q. Sun et al., 2009; Wei et al., 2009; Zhang et al., 2012). However, a number of the studies have extended the model, adding other constructs from other common technology acceptance models such as the theory of planned behaviour (Q. Sun et al., 2009; Zhang et al., 2012). This study adopts a similar approach, TAM will be used as the primary technology acceptance model. It will be extended using two constructs from planned behaviour theory, namely, social norms and self-efficacy. In addition to this, perceived risk and trust is also incorporated into the

research model. Figure 2-3 depicts the research model that is adopted to study the factors that influence South African consumers to adopt m-commerce.

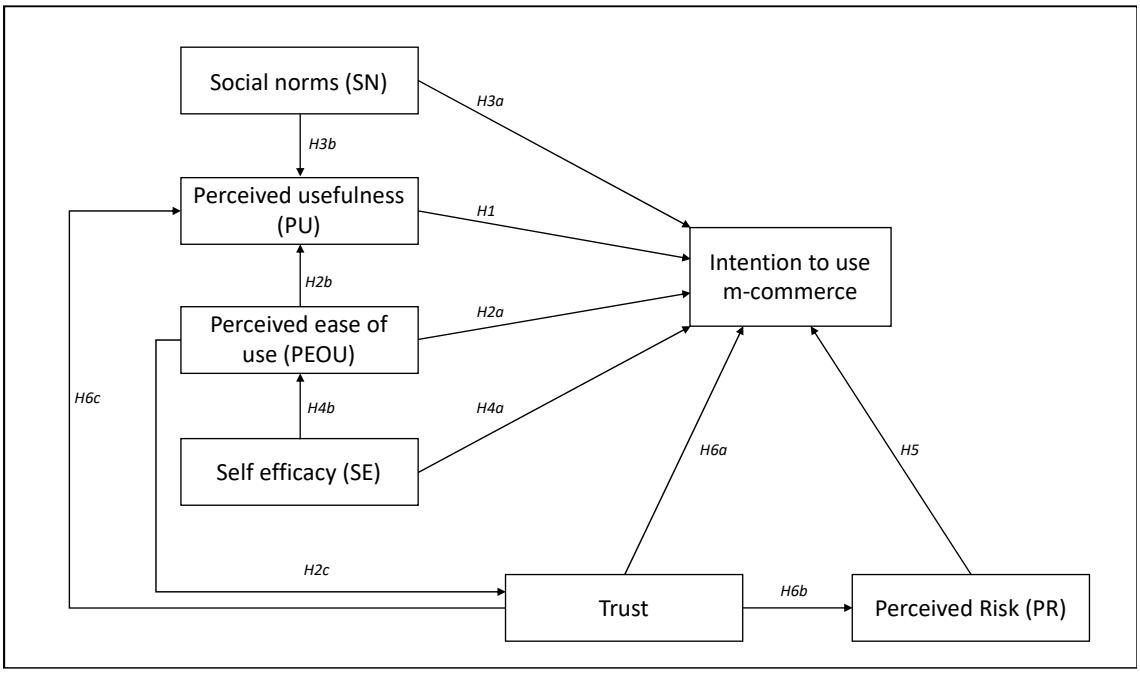


Figure 2-3: Research theoretical model

2.8 Chapter summary

The growing popularity of mobile devices is catapulting m-commerce developments. Mobile commerce is disrupting industries like retail where consumers are moving from shopping in brick-and-mortar stores to mobile shopping applications. TAM has been empirically tested and widely used to understand the key factors that influence IS adoption and most recently, m-commerce adoption. However, as robust a model as it is, several authors have found it insufficient on its own to understand adoption factors of m-commerce fully, and therefore, the model has been widely extended to include other constructs. This study extended TAM to include social norms, a construct adopted from the TPB, as well as other constructs, namely, self-efficacy, perceived risk and trust. Table 2-1 is a summary of the hypotheses adopted for this study.

Table 2-1: Summary of research hypotheses

Hypothesis	Description
H1	Perceived usefulness will have a positive effect on a consumer's intention to adopt m-commerce.
H2a	Perceived ease of use will have a positive effect on a consumer's intention to adopt m-commerce.
H2b	Perceived ease of use will have a positive effect on the consumers perceived usefulness of m-commerce
H2c	Perceived ease of use will have a positive effect on a consumer's trust towards m-commerce
H3a	Subjective norms will have a positive effect on a consumer's intention to adopt m-commerce.
H3b	Subjective norms will have a positive effect on the consumers perceived usefulness of m-commerce
H4a	Self-efficacy will have a positive effect on a consumer's intention to adopt m-commerce.
H4b	Self-efficacy will have a positive effect on the consumers perceived ease of use of m-commerce
H5	Perceived risk will have a negative effect on a consumer's intention to adopt m-commerce.
H6a	Trust will have a positive effect on a consumer's intention to adopt m-commerce.
H6b	Trust will have a positive effect on a consumer's perceived risk towards the adoption of m-commerce.
H6c	Trust will have a positive effect on a consumer's perceived usefulness of adopt m-commerce.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter describes the research methodology and process that was followed to address the hypotheses developed in chapter two. The chapter covers sections such as the research approach and research design, the method in which data was collected, the population and sample that was used for the study, a description of the research instrument, methods of analysing and interpreting the data, validity and reliability measures and last but not least, ethical considerations.

3.1 Research approach

This study sought to understand the factors that influence m-commerce adoption in South Africa, making it explanatory in nature. As such, a quantitative research methodology has been adopted. This type of research is appropriate when the research's primary objective is to explain or evaluate causal relationships, correlations, and associations (Leavy, 2017). According to Creswell (2014), if the research problem calls for the identification of factors that influence an outcome or understanding predictors of outcomes, then the quantitative research approach is best.

The quantitative methodology's underlying values include objectivity, neutrality, generalisability, and large sample sizes (Leavy, 2017). This approach is also consistent with other technology adoption studies (Khalifa & Shen, 2008b; Q. Sun et al., 2009; Wu & Wang, 2005). The main drawback of the quantitative approach is that it does not allow the researcher to probe for underlying beliefs and assumptions and to fully appreciate the variables being measured (Choy, 2014). However, this drawback is countered by the fact that this approach allows for larger sample sizes and it is objective, leaving little room for the misinterpretation of views. Results can be objectively verified (Choy, 2014).

3.2 Research design

This research employed a non-experimental, cross-sectional survey. This means that the survey was administered to participants at one point in time instead of administering the same survey multiple times to measure change over time (Leavy, 2017). The benefit of this approach is that the researcher does not need to worry about respondents pulling out of the study, as is usually the case with longitudinal studies where the researcher needs to administer the survey at multiple and different points in time (Leavy, 2017). This particular research design has been selected for this study because survey designs are the most commonly used in quantitative approaches, and they are generally used to ascertain individuals' attitudes, drivers, and behaviours (Leavy, 2017). This is particularly relevant because this study sought to ascertain the factors that influence consumers to adopt m-commerce. The advantages of surveys are that they allow for a rapid turnaround in data collection, they are economical, and more participants can be reached through the use of surveys (Creswell, 2014).

3.3 Data collection methods

Data was gathered through a questionnaire, which is the primary data collection tool in survey research (Leavy, 2017). The questionnaire was a self-administered, web-based questionnaire administered through an online survey tool called Qualtrics. Due to the government's social distancing restrictions, the study did not make use of any print questionnaires. The questionnaires were circulated to the participants via email. An email with the link to the survey was circulated to Wits students by the university. This method of collecting data was suitable for this research study because it reached a large number of participants.

3.4 Population and sample

3.4.1 Population

The target population for this study was university students with mobile smartphones. Consumers with smartphone devices can be considered more

likely to adopt m-commerce than those that do not have the correct type of device (Wei et al., 2009). According to Statista (2020), the smartphone penetration rate as a share of the population in South African is 40% for the year 2020, and this is projected to reach 43% by 2023. Smartphones, defined as handheld personal computers equipped with persistent network connectivity and supporting the installing of new applications (Oulasvirta, Rattenbury, Ma & Raita, 2012), are critical as a facilitator for m-commerce adoption.

3.4.2 Sample and sampling method

A random sample was selected for this study. This was done to allow all the individuals in the population to have an equal opportunity of being selected. Randomisation allows for the representative sample to be used to generalise the population (Creswell, 2014). Random sampling is a probability sampling strategy that is typically applied in quantitative approaches, and it is useful when researchers want to generalise their findings (Leavy, 2017). This was particularly appropriate because this study sought to understand the factors that influence m-commerce adoption from individuals who have never engaged in any m-commerce activity, those that have but stopped for whatever reason, and those currently using m-commerce. Thus, selecting individuals randomly consequently classified the consumer into one of these bases.

The desired demographic profile for this sample was university students. This sample base was appropriate because university students make up the biggest segment of modern technology users (Davis, 1989), and they are very influential in their friends' and families' purchasing decisions (Yadav et al., 2016).

The size of the sample is crucial in determining the statistical power and the generalisability of the results (Hair, Black, Babin, & Anderson, 2013). According to Hair et al. (2013), the general rule is that the ratio observations: independent variable in a variate should never fall below 5:1. However, the desired level is between 15 to 20 observations for each independent variable (Hair et al., 2013). This means that because this study comprised six independent variables, the desired sample size was 90 and 120. In instances where the sample size falls

short of these limits, Hair et al. (2013) purport that the generalisability of the results should be validated. The sample size for this study was 806, and therefore far exceeded these thresholds.

3.5 The research instrument

The research instrument used in this study was a self-administered web-based questionnaire conducted through an online survey tool called Qualtrics. The questionnaire was divided into two parts, the first part gathered demographic information relevant to the study, and the second part comprised several questions grouped according to the constructs discussed in the literature review.

The scales were adopted from the research examined in the literature review (Yadav et al., 2016), and a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) was used for the second part of the questionnaire. The instrument was assembled from components of different studies depending on the construct being measured. Therefore, the original reliability and validity of the instruments no longer held true and these variables needed to be re-tested (Creswell, 2014).

The research instrument was accompanied by a cover letter informing participants of the purpose of the research, what would be done with the data gathered from them and what their rights were. In addition to this, m-commerce was defined before the participants commenced with the questionnaire to ensure that all participants worked off the same definition and understanding.

The research instrument was designed in such a way that a participant could not proceed to the next question without completing the current question, the intention was to try and minimise the number of questionnaires with missing information. This posed an inherent risk of participants dropping off because they did not want to answer certain questions. The questionnaire was piloted prior to being circulated to ensure that no issues were encountered after it had been launched.

3.6 Data analysis and interpretation

The first part of the questionnaire, which was the profile of the respondents, was analysed using descriptive statistics. The frequencies for variables such as the participants' age, gender, highest level of education, etc. was presented using the appropriate graphs and tables.

The second part of the questionnaire was analysed using inferential statistics. Factor analysis, specifically principal components analysis, was used to analyse the interrelationships between variables and explain these variables in terms of the factors that underpin them (Hair et al., 2013). Factor analysis is commonly used used to analyse the factor structure of a data set (Cohen, 2019). Variables that are largely independent of other subsets but correlated to each other were combined into factors (Tabachnick & Fidell, 2013). This analysis presented a KMO and Barlett's test result which was used to indicate the appropriateness of PCA (Cohen, 2019), and is deemed acceptable if above 0.5, and great if above 0.8 (Field, 2017).

3.6.1 Validity

Validity measures whether an instrument measures what it purports to measure (Creswell, 2014). It refers to the degree to which a set of measures correctly represent the concept of the study; it is concerned with how well the concept is defined by its measures (Hair et al., 2013). This was particularly important to measure because the questionnaire comprised multiple scales which measured different constructs. The items used were adopted from other credible studies within the field and had previously been tested for validity. However, because some of the items were modified to suit the current study, the validity was retested.

Construct validity was measured using factor analysis in this study. The items were examined using principle components extraction with varimax rotation, an

orthogonal rotation method, and the results from the KMO and Bartlett's test were used. If the KMO exceeds the threshold of 0.5, and Bartlett's test is found to be significant, this verifies the appropriateness of the factor analysis (Wei et al., 2009), and thus provides evidence of construct validity. The latent root criterion was used to determine how many of the factors to retain, and only factors with eigenvalues greater than 1 were considered significant and therefore retained (Hair et al., 2013).

3.6.2 Reliability

Reliability measures whether an instrument can be interpreted consistently across different situations (Field, 2017). The reliability of the results from the questionnaire in this study was tested using Cronbach alpha measurements. Field (2017) suggests that Cronbach alpha's that range between 0.7 and 0.8 are deemed acceptable, however, they may be lower when dealing with psychological constructs. Thus, the aim was for the Cronbach alpha's of all the constructs to exceed 0.7, which would indicate that the constructs represent a reasonable level of internal consistency.

3.6.3 Correlation analysis

A correlations analysis was conducted to provide an initial test of the hypotheses, and then it was followed by a multiple regression analysis that was used as the basis on which the hypotheses were formally accepted or rejected. The correlation analysis was conducted using a parametric test called Pearson's correlation. Correlation is the measure of size and direction of the linear relationship between two variables (Tabachnick & Fidell, 2013). Pearson's correlation coefficient varies from -1 (perfect negative relations) through 0 (no relationship) to +1 (perfect positive relationship (Field, 2017).

3.6.4 Multiple regression analysis

A multiple regression was then conducted. Multiple regression was the appropriate method of analysis in this case because a dependent variable with a single metric was assumed to be related to more than two metric independent

variables (Hair et al., 2013). Multiple regression was suitable for this study because although the correlations analysis was useful, it did not provide us with an indication of the combined effects of the independent variables on the dependent variable (Cohen, 2019) The variance inflation factor (VIF) and the tolerance statistic (1/VIF) was used to test for the multicollinearity problem, which occurs when two or more independent variables are highly correlated in multiple regression. Tolerance values ought to be close to 1, while VIFs should be close to zero (Cohen, 2019).

3.7 Limitations of the study

- M-commerce is a relatively new technology in South Africa, and this poses a risk that respondents may not understand what the study purports to do.
- The smartphone penetration level as a percentage of the population is currently forty percent (Statista, 2020), which means that the sample size is reduced drastically.
- The population size targets university students and young professionals, which excludes other segments, such as the older consumers.
- The response rate for self-administered questionnaires is generally low, thus the questionnaires would have had to be circulated to a larger sample base.
- The results were likely skewed towards more respondents in Johannesburg, which may not be a true representation of the South African population.
- Research on m-commerce adoption in South Africa is limited, therefore, this study adapted research predominantly from the Asian countries.

3.8 Ethical considerations

In order to ensure that this study was ethically sound, the questionnaire was anonymous, and the respondents had to give consent before proceeding with the questionnaire. This consent page acquainted the respondents with their rights and responsibilities as participants of the study and gave the respondents an

overview of what the purpose of the study was and what the results would be used for. Respondents did not have to disclose their personal identities, and no sensitive information was requested from them.

Respondents were not incentivised to participate in the questionnaire. This was to ensure that the risk of perceived bribery was avoided. Furthermore, respondents were notified that this study would be used solely for academic purposes, and no parts of the research would be used for commercial purposes.

Lastly, the researcher conducted the research themselves, no professional research company or the likes were used to conduct any part of the research, and the researcher referenced all the sources used for the purposes of conducting the research.

CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

The purpose of this chapter is to present and describe the data analysis results that were obtained from the questionnaire. The chapter begins by presenting the respondents' profile, looking at the demographics and the respondents' mobile device usage behaviour. This is followed by the description of the measurement tool analysis, which includes validity and reliability results obtained from PCA analysis. Lastly, the bivariate correlations and multiple regressions results are presented, and these test the study's hypotheses.

4.2 Profile of respondents

A link to the survey was circulated on email and the total number of responses received was 806. Out of the 806 responses, 107 of the responses were incomplete – 33 of the respondents had not started the survey at all, which means that they may have opened it and closed it before commencing. The remaining 74 of the 107 respondents started the survey but only completed the first part of the questionnaire, which was the demographics and the mobile device usage questions. Therefore, only 699 of the 806 responses were completed and considered for further analysis. This means that 87% of the respondents completed the survey, as shown in Table 4-1.

Table 4-1: Survey response and completion

Responses	Frequency	Percentage
Incomplete surveys	107	13%
Complete surveys	699	87%
Total	806	100%

4.2.1 Demographics

The analysis below is based on the 699 respondents that fully completed the survey. Of the 699 respondents, 420 (60%) were male, and the remaining 279 (40%) were female. The majority of the respondents were Black, 499 (71%), with

White and Indian respondents representing 12% (85) and 10% (69), respectively. The majority of the respondents, 573 (82%), were below 35, with the age group 18-24 years being the most popular – 391 (56%) respondents. Lastly, 224 (32%) of the respondents were students, while 171 (24%) had undergraduate degrees, 178 (25%) had postgraduate degrees, and 178 (16%) had masters degrees. Table 4-2 gives a detailed view of the demographics of the respondents.

Table 4-2: Demographic profile of respondents

Demography	Category	Frequency	Percentage
Gender	Male	279	40%
	Female	420	60%
		699	100%
Race	Black	499	71%
	Coloured	37	5%
	Indian	69	10%
	White	85	12%
	Other	9	1%
		699	100%
Age	18-24	391	56%
	25-34	182	26%
	35 and above	126	18%
		699	100%
Level of education	Student	224	32%
	Undergraduate degree	171	24%
	Postgraduate degree	178	25%
	Masters degree	113	16%
	Professional degree	13	2%
		699	100%

4.2.2 Usage behaviour

The survey data revealed that 99% of the respondents have a smartphone. However, only 429 (61%) respondents have a smartphone only, the other 263 (38%) have multiple devices, either a smartphone and tablet (19%), a smartphone and a wearable (7%) or all three devices, a smartphone, tablet and wearable (12%). Only one respondent reported not having any of the devices. Table 4-3 gives more detail of the types of devices the respondents have.

Table 4-3: Types of devices owned

Type of device	Frequency	Percentage
Smartphone	429	61%
Smartphone and Tablet	130	19%
Smartphone, tablet and wearable	87	12%
Smartphone and wearable	46	7%
Tablet	6	1%
None	1	0,1%

The respondents were asked if they ever shop on any of their mobile devices, and 83 (12%) of the respondents reported never shopping on any of their mobile devices. Only 57 (8%) of the respondents reported that they always shop on one of their mobile devices. The remainder of the respondents had engaged in some sort of shopping on their mobile device to varying degrees. 21% reported that they seldom shop on their mobile device, 36% sometimes do, and 23% shop often. Figure 4-1 illustrates how often, if at all, the respondents shop on their mobile devices.

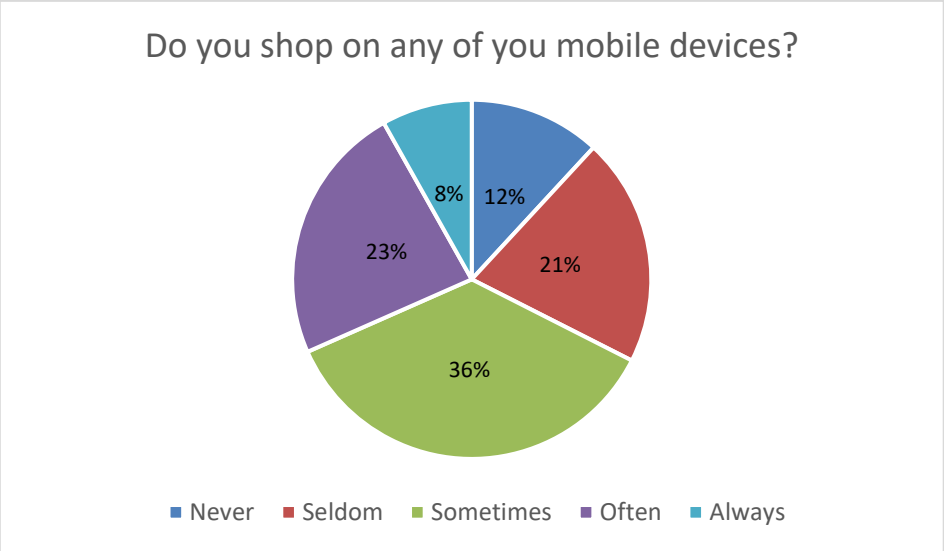


Figure 4-1: Mobile shopping frequency

The category with the most purchases was fashion. 374 (54%) of the respondents reported that when shopping on their mobile device, they shop for fashion items, 351 (50%) of the respondents shopped for electronics, while 308 (44%) shopped for entertainment and ticketing. 90 (13%) of the respondents reported that they do not shop on their mobile device. Table 4-4 shows a breakdown of the other shopping categories.

Table 4-4: Mobile shopping categories

Shopping category	Frequency	Percentage
Fashion	374	54%
Electronics	351	50%
Entertainment & ticketing	308	44%
Books	244	35%
Groceries	181	26%
Don't shop on the mobile device	90	13%

In addition, the respondents were also asked to choose which of the shopping applications listed in table 4-5 they had previously used. Takealot was the most popular application amongst the respondents, with 549 (79%) of the respondents having used the app. It was followed by Superbalist, with 232 (33%) of the 699 respondents and 143 (20%) of the respondents had shopped on the Woolworths app, and only 49 (7%) on the Zara app.

Table 4-5: Mobile shopping applications used

Application	Frequency	Percentage
Takealot	549	79%
Superbalist	232	33%
Zando	88	13%
Zara	49	7%
Woolworths	143	20%

Lastly, in addition to using their mobile devices for mobile shopping, 605 (87%) of the respondents also reported using their devices for social media and banking, which are also classified as mobile commerce. Table 4-6 demonstrates the responses.

Table 4-6: Other mobile device uses

Other	Frequency	Percentage
Social media	45	6%
Banking	49	7%
Both	605	87%

4.3 Analysis of measurement scale

The section below presents the validity and reliability test results, which were measured using factor analysis, more specifically, Principal Components Analysis (PCA) and Cronbach alpha, respectively.

4.3.1 Convergent and discriminant validity

An initial PCA was run on all 22 items in the research model. However, there were five items loading highly (above 0.7) on the same component. This was of particular concern because the five items were not intended to measure the same construct. Two of the items measured the dependent variable, Intention to Use (IU), while the other three measured the independent variable, Perceived Usefulness (PU). Hair et al. (2013) posit that it is inappropriate to mix independent and dependent variables in the same factor analysis, as this is not conceptually valid. Therefore, the two items measuring Intention to Use were eliminated from the PCA.

A second PCA was then performed, and three items were eliminated. Two of the items had cross-loadings of above 0.4 on two different components, failing the uni-dimensionality test, while the other item loaded on a construct it was not intended to measure, failing the convergent validity test. Table 4-7 gives a summary of the items that were deleted.

Table 4-7: Second PCA results

Item Number	Reason for elimination
IU1	Dependent Variable cannot be mixed with Independent variables in the same factor analysis
IU2	
PEOU4	Loaded highly on a component it was not intended to measure, component 6, while the rest of the items loaded highly on the same component - component 3
SN1	Had high cross-loadings (above 0.4) on two different components. Component 4 and component 6
PR1	Had high cross loadings (above 0.4) on two different components. Component 1 and component 5

A third PCA was then performed, and a stable pattern emerged. The tests that follow were conducted on the items that were retained.

Table 4-8 presents the KMO and Bartlett's test results, which indicate the appropriateness of using PCA. The KMO measure indicates appropriateness when the value is above 0.5 or 0.8 preferably, and when Bartlett's test is significant (Cohen, 2019; Field, 2017; Hair et al., 2013). The KMO measure for this study has a measure of 0.834, which is above the 0.6 thresholds and the preferred threshold of 0.8, while Bartlett's Test of Sphericity is significant with a p-value < 0.001. Therefore, this confirms that this sample is appropriate for factor analysis.

Table 4-8: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,834
Bartlett's Test of Sphericity	Approx. Chi-Square	4987,951
	Df	136
	Sig.	0,000

Table 4-9 presents a measure of the portion of variance that can be described by the extracted factors (Field, 2017), and this is known is communalities. The factors should all exceed 0.3 and ideally 0.4 (Cohen, 2019). The factors below all exceed 0.4, ranging from 0.597 to 0.852.

Table 4-9: Communalities

Communalities		
	Initial	Extraction
PU1	1,000	0,699
PU2	1,000	0,733
PU3	1,000	0,806
PEOU1	1,000	0,761
PEOU2	1,000	0,786
PEOU3	1,000	0,793
SN2	1,000	0,597
SN3	1,000	0,689
SN4	1,000	0,605
SE1	1,000	0,691
SE2	1,000	0,715
SE3	1,000	0,627
PR2	1,000	0,806
PR3	1,000	0,813
T1	1,000	0,812
T2	1,000	0,852
T3	1,000	0,702
Extraction Method: Principal Component Analysis.		

Table 4-10 describes the total variance explained. This table shows the number of factors that are to be retained, as not all factors are retained. The latent root criterion was used to determine how many of the factors to retain, and only factors with eigenvalues greater than 1 were considered significant, and therefore retained (Hair et al., 2013). Since five of the items were deleted, only a total of 17 components were available, and a solution with a component for each item would have resulted in 17 components being retained, and thus 100% variance being explained (Cohen, 2019). However, because only items with eigenvalues greater

than 1 were retained, only six of the components were retained. These six components account for the majority of the variance, which is 73,47%. This is above the recommended threshold of 60%.

Table 4-10: Total Variance Explained

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,324	31,319	31,319	5,324	31,319	31,319	2,436	14,327	14,327
2	2,199	12,935	44,253	2,199	12,935	44,253	2,386	14,035	28,362
3	1,534	9,024	53,278	1,534	9,024	53,278	2,341	13,768	42,130
4	1,216	7,153	60,431	1,216	7,153	60,431	1,902	11,191	53,321
5	1,119	6,582	67,013	1,119	6,582	67,013	1,728	10,163	63,484
6	1,097	6,452	73,465	1,097	6,452	73,465	1,697	9,980	73,465
7	0,679	3,992	77,456						
8	0,612	3,603	81,059						
9	0,507	2,981	84,040						
10	0,475	2,794	86,834						
11	0,433	2,545	89,379						
12	0,385	2,267	91,646						
13	0,358	2,106	93,752						
14	0,313	1,843	95,595						
15	0,289	1,702	97,297						
16	0,275	1,615	98,912						
17	0,185	1,088	100,000						
Extraction Method: Principal Component Analysis.									

The scree plot below further supports the finding that only six components account for the majority of the variance. From figure 4-2, it is clear that only six of the seventeen components have eigenvalues greater than 1, and therefore, only six of the factors are to be retained.

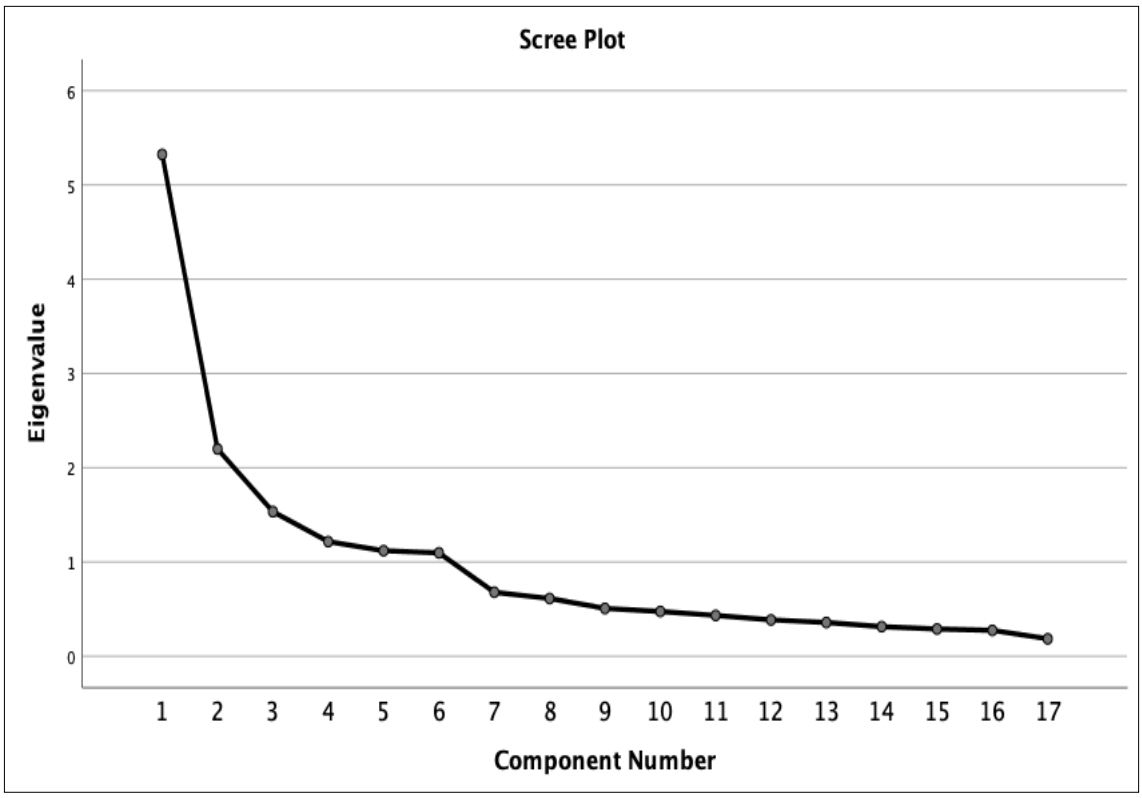


Figure 4-2: Scree plot

Table 4-11 illustrates the rotated component matrix. The orthogonal rotation method, varimax rotation, was selected as its ability to achieve a simplified factor structure renders it superior than other orthogonal factor rotation methods (Hair et al., 2013). To further ensure an easier to interpret component matrix, coefficients less than the threshold of 0.4 were suppressed.

The result matrix below once again reflects that six components were retained, these components are: component 1 = Trust (T), component 2 = Perceived Ease of Use (PEOU), component 3 = Perceived Usefulness (PU), component 4 = Social Norms (SN), component 5 = Self-efficacy (SE) and component 6 = Perceived Risk.

Furthermore, these rotated component matrix results show evidence of uni-dimensionality, as all the retained items have loaded onto a single component, showing that they represent a single construct. Secondly, convergent validity is evident as all the items intended to measure a single construct are concentrated around that single construct with factor loadings above 0.6. Lastly, discriminant validity is evident because there are no factors cross-loading above the 0.4 thresholds, that is, items within a single construct are not highly correlated with other items in another construct. The six components that have been retained correspond with the constructs in this study's research model, although a few items have been eliminated. This provides evidence of construct validity.

Table 4-11: Rotated Component Matrix

Rotated Component Matrix[a]						
	Component					
	1	2	3	4	5	6
PU1			0,794			
PU2			0,815			
PU3			0,822			
PEOU1		0,811				
PEOU2		0,799				
PEOU3		0,854				
SN2				0,726		
SN3				0,819		
SN4				0,730		
SE1					0,647	
SE2					0,778	
SE3					0,680	
PR2						0,865
PR3						0,883
T1	0,852					
T2	0,869					
T3	0,801					
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]						
a. Rotation converged in 6 iterations.						

4.3.2 Scale reliability

In this section, the reliability of the scale was measured using Cronbach's alpha. The scale is said to be reliable if Cronbach's alpha is above 0.7, and 0.6 if the study consists of new scales (Cohen, 2019). Table 4-12 gives a summary of the Cronbach alpha's for each construct. All the constructs have Cronbach alpha's exceeding the 0.7 thresholds, except Social Norms, which has a measurement of 0.662. Therefore, there is evidence that the scale is reliable, and since this measurement tool was adapted from numerous study, the 0.662 reliability coefficient found in SN is accepted and therefore considered reliable.

An additional item, SE3, was eliminated during the reliability tests to increase the Cronbach alpha from 0.605 to 0.740. This reduced the number of items in Self-efficacy from three items to two items, and the total items decreased from seventeen items to sixteen.

Table 4-12: Summary of Cronbach Alpha results

Construct/Variable	Original number of measurement items	Items removed during PCA	Items removed after reliability test	Final number of items measured	Crobach Alpha	Reliability conclusion
Intention to use (IU)	2	0	0	2	0,806	Good
Perceived Usefulness (PU)	3	0	0	3	0,819	Good
Perceived Ease of Use (PEOU)	4	1 (PEOU4)	0	3	0,853	Good
Social Norms (SN)	4	1 (SN1)	0	3	0,662	Acceptable
Self-efficacy (SE)	3	0	1 (SE3)	2	0,740	Acceptable
Percieved Risk (PR)	3	1 (PR1)	0	2	0,782	Acceptable
Trust (T)	3	0	0	3	0,858	Good

4.4 Correlation analysis

The Pearson's correlation coefficient was used to measure the strength of a relationship between two constructs (Field, 2017), and this was to provide an initial test for the hypotheses. Therefore, this section presents the results for each hypothesis. Thereafter, a multiple regression is used to accept or reject the hypothesis formally.

4.4.1 Perceived Usefulness and Intention to Use

The relationship between Perceived Usefulness and Intention to Use is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.599 and the p-value, 0.001. This indicates a strong positive correlation between the two variables. Therefore, this finding supports hypothesis 1 which states that PU will have a positive effect on consumers' intention to adopt m-commerce. Figure 4-3 graphically illustrates this relationship.

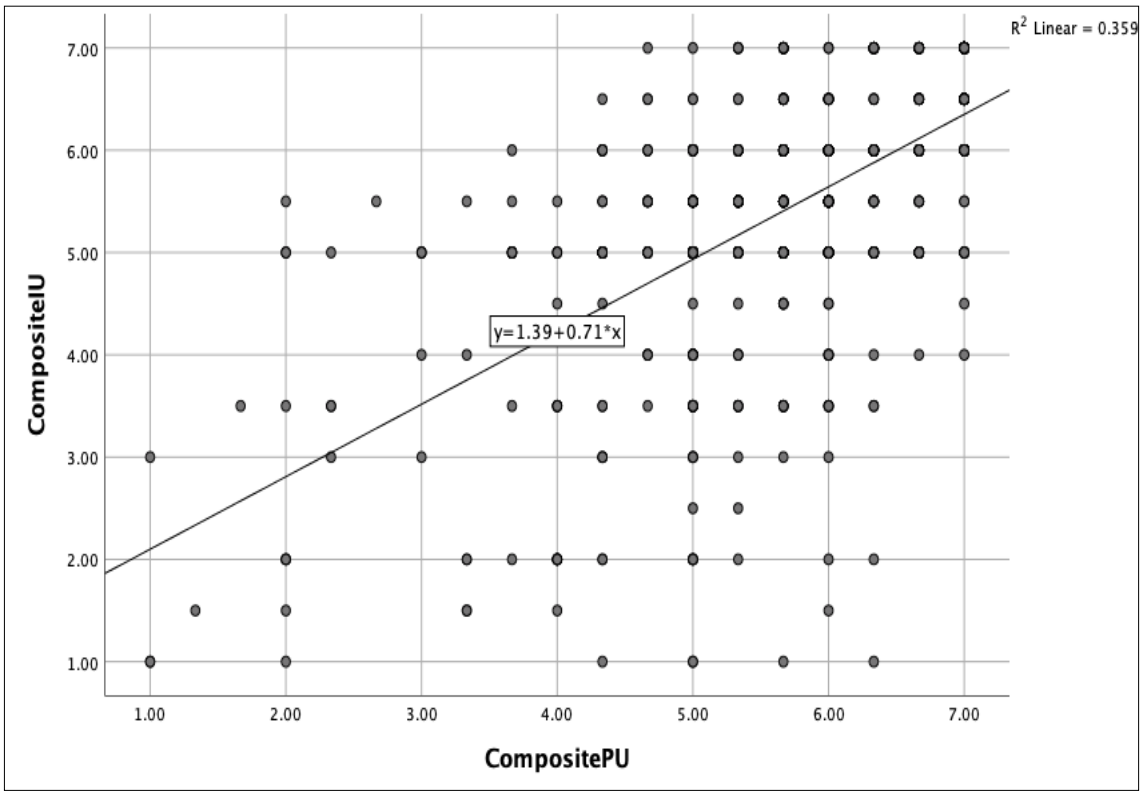


Figure 4-3: Scatterplot for Perceived Usefulness and Intention to Use

4.4.2 Perceived Ease of Use and Intention to Use

The relationship between Perceived Ease of Use and Intention to Use is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.425 and the p-value < 0.001. This indicates a strong positive correlation between the two variables. Therefore, this finding supports hypothesis 2a which states that PEOU will have a positive effect on consumers' intention to adopt m-commerce. Figure 4-4 graphically illustrates the relationship.

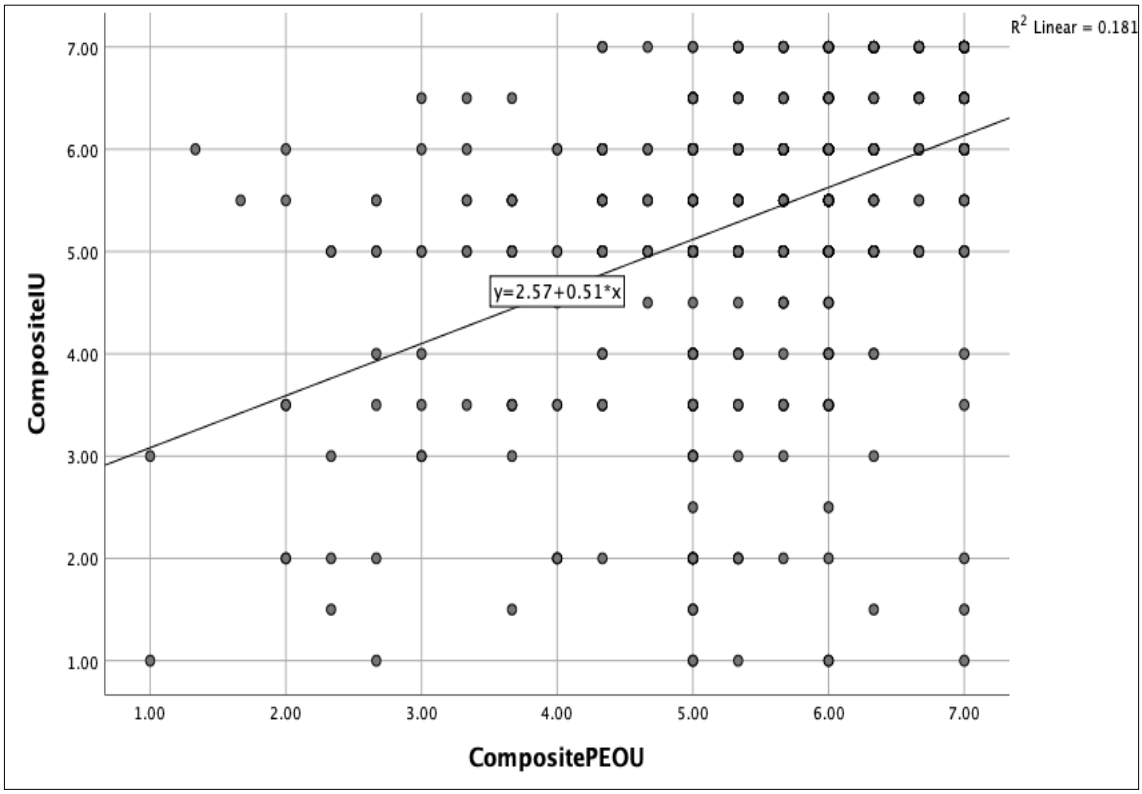


Figure 4-4: Scatterplot for Perceived Ease of Use and Intention to Use

4.4.3 Perceived Ease of Use and Perceived Usefulness

The relationship between Perceived Ease of Use and Perceived Usefulness is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.504 and the p-value < 0.001. This indicates a strong positive correlation between the two variables. Therefore, this finding supports hypothesis 2b which states that PEOU will have a positive effect on consumers' perceived usefulness of m-commerce. Figure 4-5 graphically illustrates the relationship.

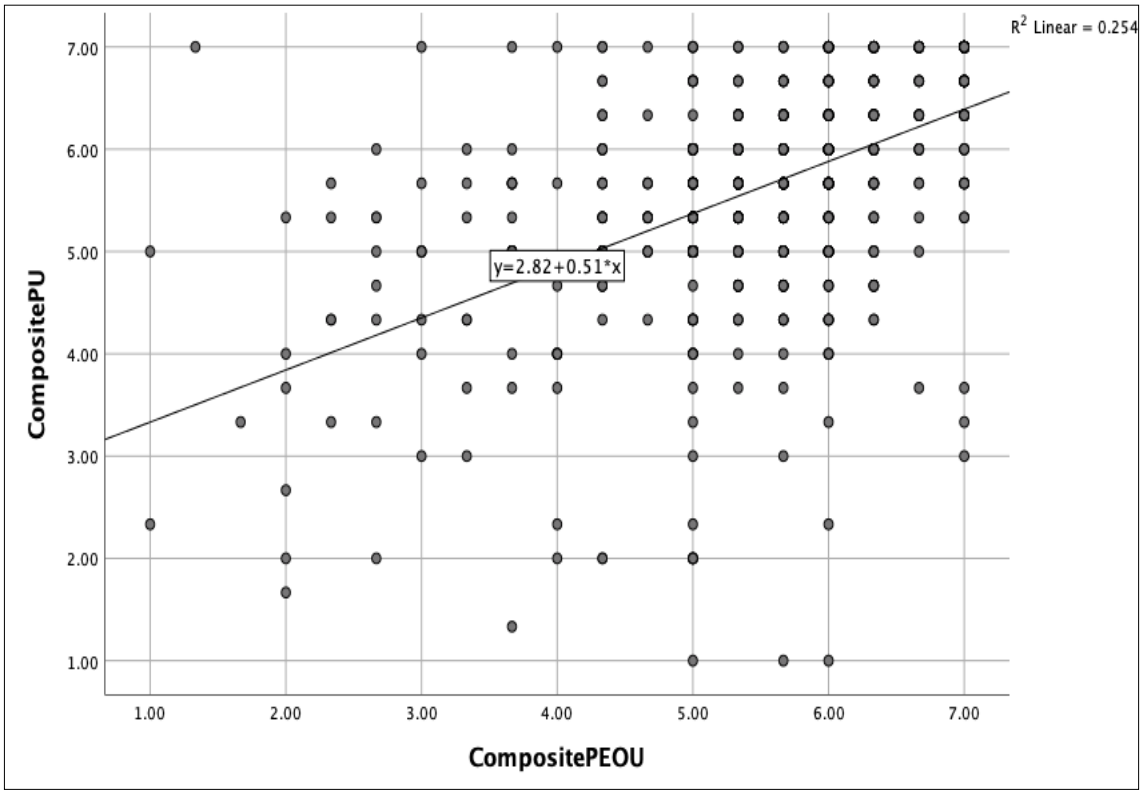


Figure 4-5: Scatterplot for Perceived Ease of Use and Perceived Usefulness

4.4.4 Perceived Ease of Use and Trust

The relationship between Perceived Ease of Use and Trust is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.403 and the p-value < 0.001. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 2c, which states that PEOU will positively affect consumer's trust towards m-commerce. Figure 4-6 graphically illustrates the relationship.

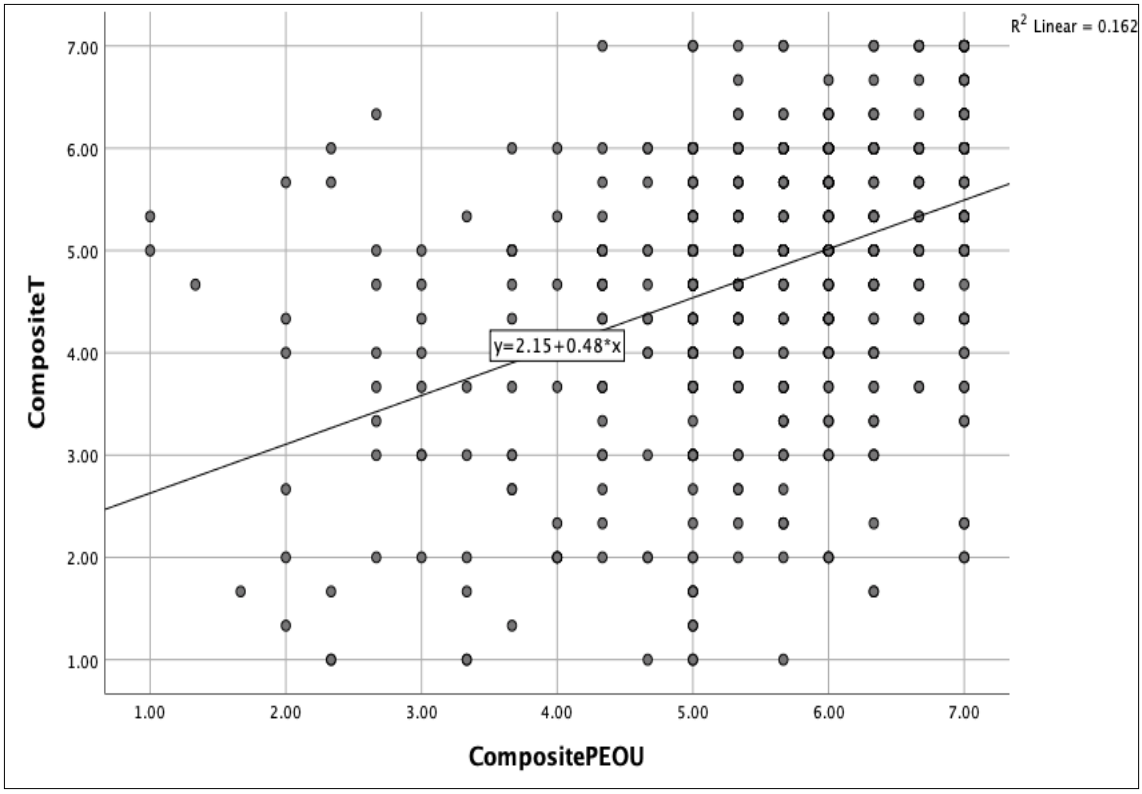


Figure 4-6: Scatterplot for Perceived Ease of Use and Trust

4.4.5 Subjective Norms and Intention to Use

The relationship between Subjective Norms and Intention to Use is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.301 and the p-value < 0.001. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 3a which states that Subjective Norms will positively affect consumers' intention to adopt m-commerce. Figure 4-7 graphically illustrates the relationship.

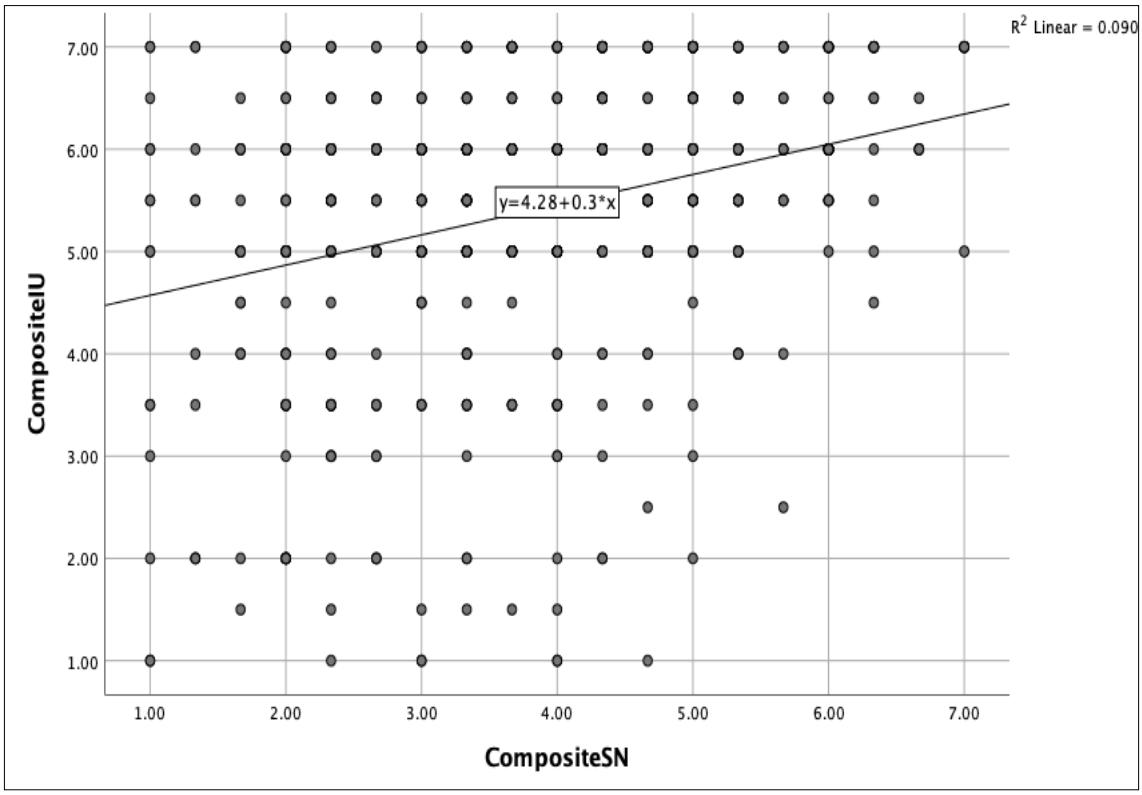


Figure 4-7: Scatterplot for Subjective Norms and Intention to Use

4.4.6 Subjective Norms and Perceived Usefulness

The relationship between Subjective Norms and Perceived Usefulness is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.256 and the p-value < 0.001. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 3b, which states that Subjective Norms will positively affect consumers' perceived usefulness of m-commerce. Figure 4-8 graphically illustrates the relationship.

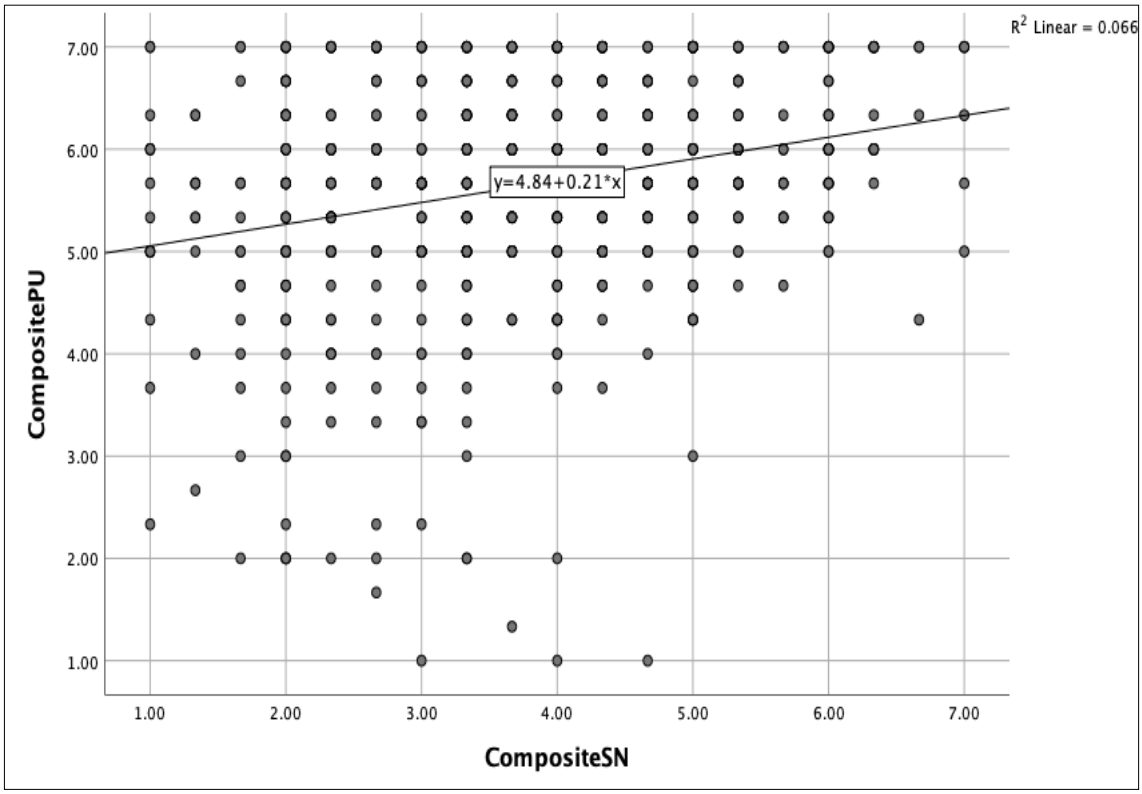


Figure 4-8: Scatterplot for Subjective Norms and Perceived Usefulness

4.4.7 Self-efficacy and Intention to Use

The relationship between Self-efficacy and Intention to use is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.429 and the p-value < 0.001. This indicates a positive correlation between the two variables. This finding supports hypothesis 4a, which states that Self-efficacy will positively affect consumers' intentions to adopt m-commerce. Figure 4-9 graphically illustrates the relationship.

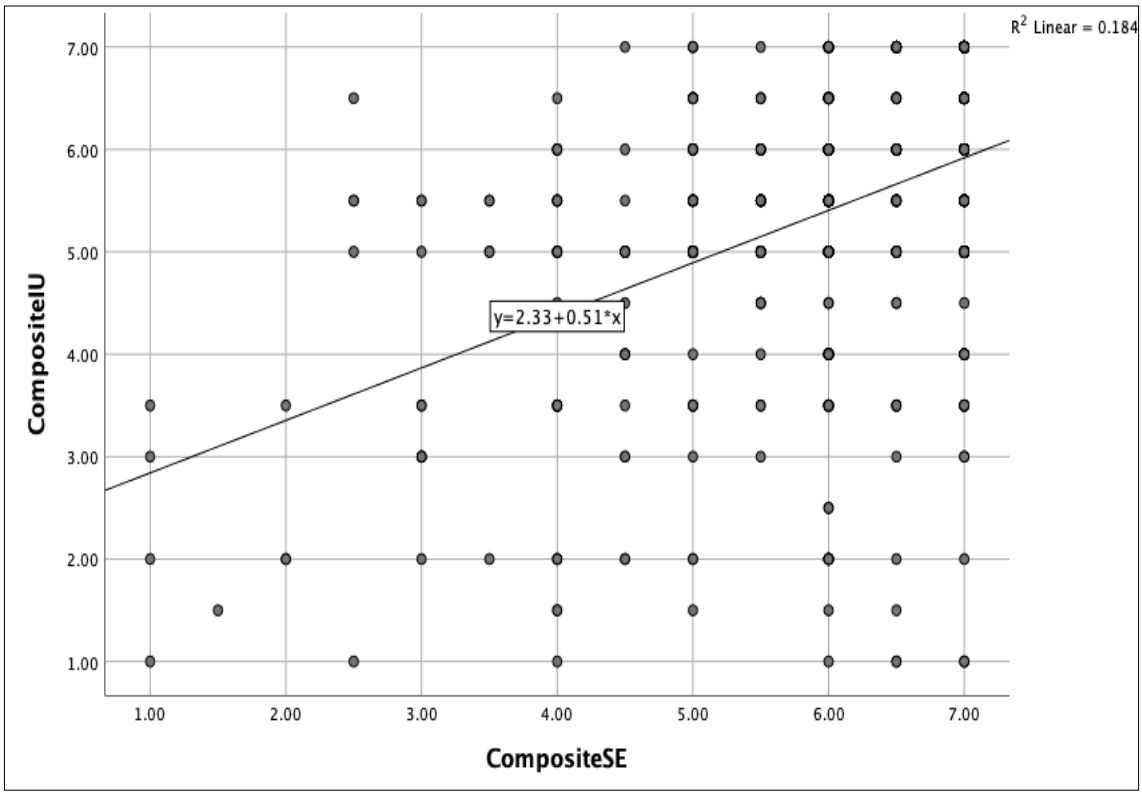


Figure 4-9: Scatterplot for Self-efficacy and Intention to Use

4.4.8 Self-efficacy and Perceived Ease of Use

The relationship between Self-efficacy and Perceived Ease of Use is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.473 and the p-value < 0.001. This indicates a positive correlation between the two variables. This supports hypothesis 4b, which states that Self-efficacy will positively affect consumers; therefore, this finding supports hypothesis 4b, which states that Self-efficacy will positively affect consumers' perceived ease of use of m-commerce. Figure 4-10 graphically illustrates the relationship.

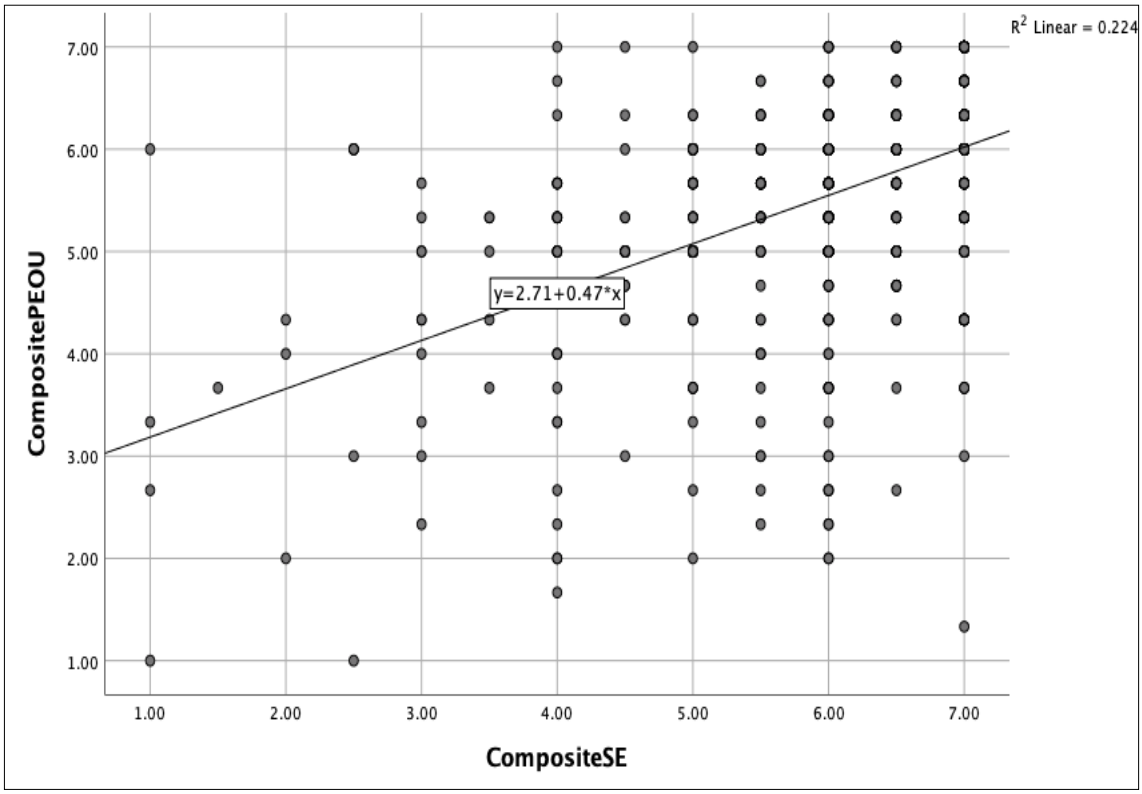


Figure 4-10: Scatterplot for Self-efficacy and Perceived Ease of Use

4.4.9 Perceived Risk and Intention to Use

The relationship between Perceived Risk and Intention to Use is statistically significant at the 0.05 level. The results show that the correlation coefficient is 0.092 and the p-value < 0.05. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 5, which states that Perceived Risk will positively affect consumer's Intention to adopt m-commerce. Figure 4-11 graphically illustrates the relationship.

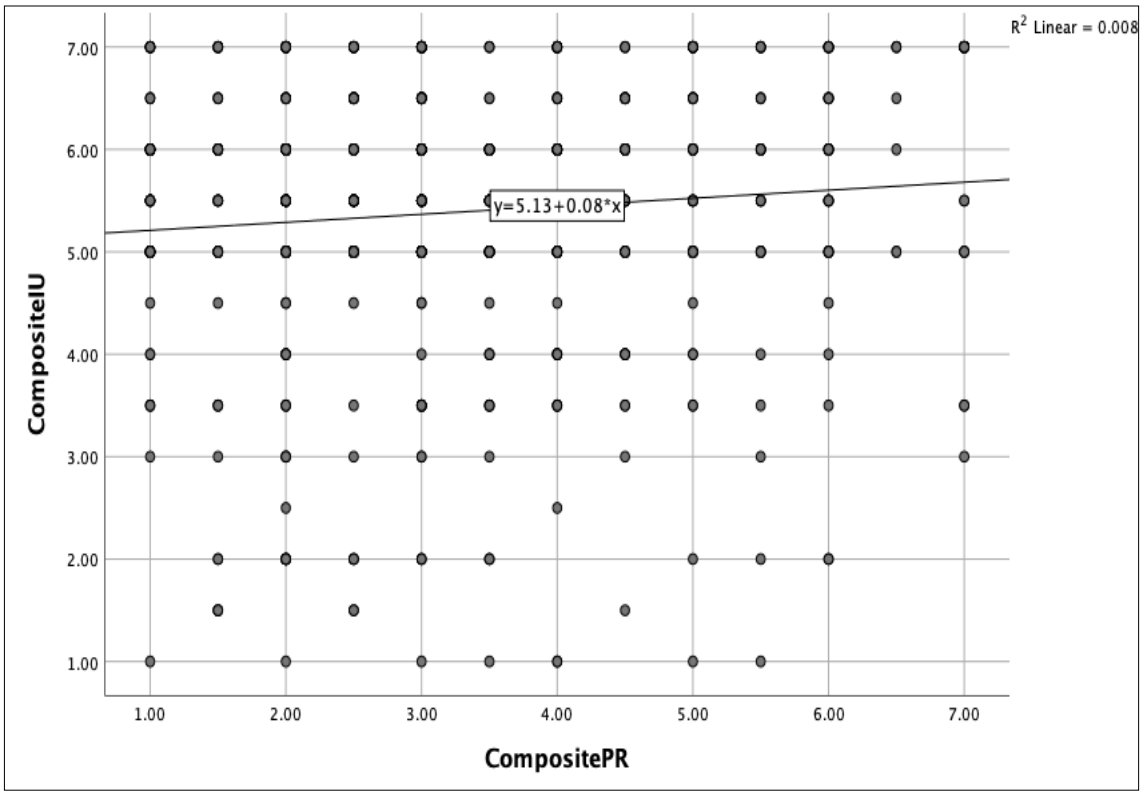


Figure 4-11: Scatterplot for Perceived Risk and Intention to Use

4.4.10 Trust and Intention to Use

The relationship between Trust and Intention to Use is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.328 and the p-value < 0.001. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 5a, which states that Trust will positively affect consumer's Intention to adopt m-commerce. Figure 4-12 graphically illustrates the relationship.

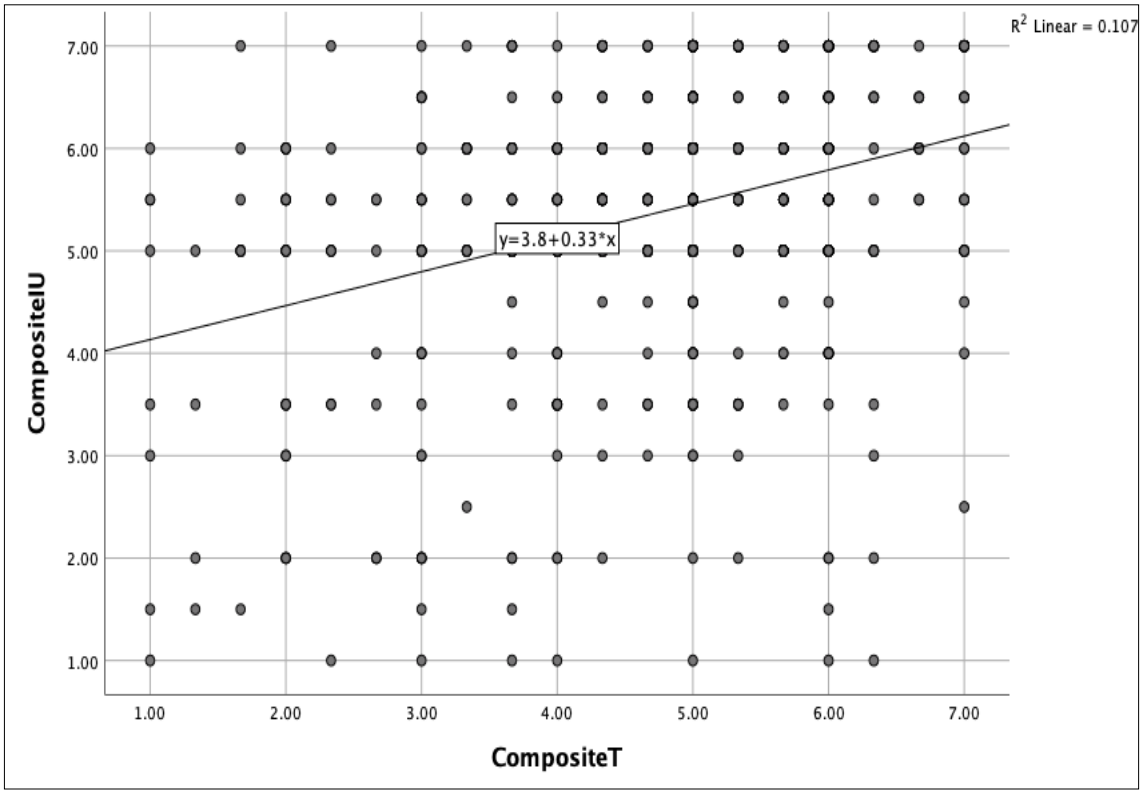


Figure 4-12: Scatterplot for Trust and Intention to Use

4.4.11 Trust and Perceived Risk

The relationship between Trust and Perceived Risk is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.340 and the p-value < 0.001. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 5b which states that Trust will positively affect consumer's Perceived Risk towards m-commerce. Figure 4-13 graphically illustrates the relationship.

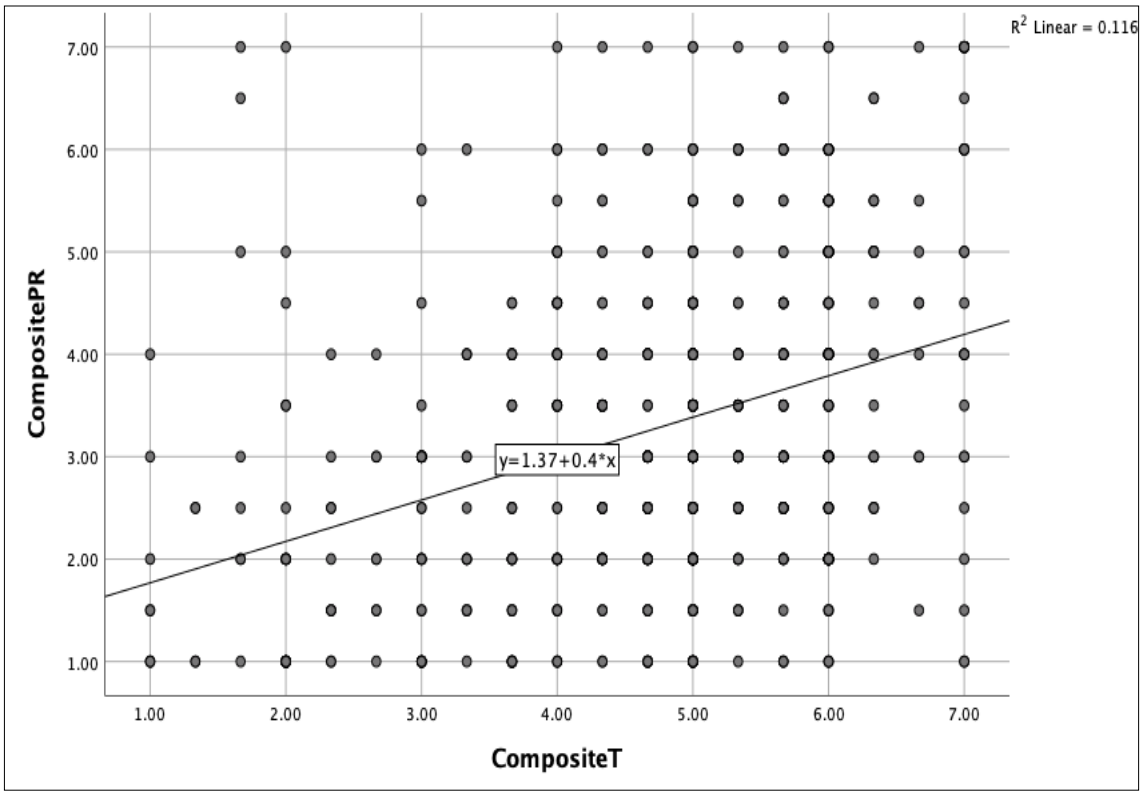


Figure 4-13: Scatterplot for Trust and Perceived Risk

4.4.12 Trust and Perceived Usefulness

The relationship between Trust and Perceived Usefulness is statistically significant at the 0.01 level. The results show that the correlation coefficient is 0.356 and the p-value < 0.001. This indicates a positive correlation between the two variables. Therefore, this finding supports hypothesis 5c, which states that Trust will positively affect consumer's Perceived Usefulness of m-commerce. Figure 4-14 below graphically illustrates the relationship.

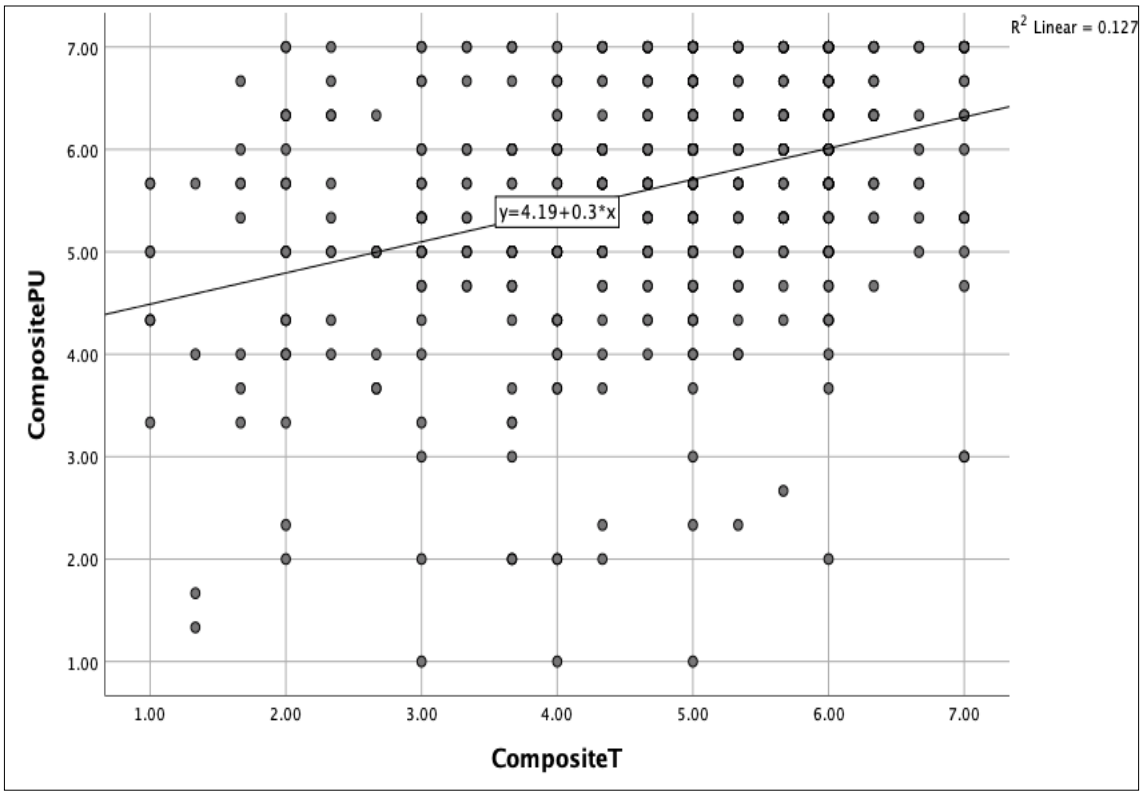


Figure 4-14: Scatterplot for Trust and Perceived Usefulness

4.5 Multiple regression analysis

This section presents the results of the multiple linear regressions that were run in order to analyse the effect of multiple independent variables on a single dependent variable. Two linear regressions were conducted, one to measure the dependent variable Intention to Use and the other Perceived Usefulness.

4.5.1 Multiple regression analysis to determine Intention to Use (IU)

The first multiple linear regressions analysed the relationship between the dependent variable Intention to use and the independent variables Trust, Social Norms, Perceived Risk, Perceived Usefulness, Self-efficacy and Perceived Ease of Use. From the results below, R square is found to be 0.442, which means that the model explains approximately 44% of the variance in consumers intentions to use m-commerce, or more simplistically, the independent variables can account for 44% of consumers intentions to adopt m-commerce. This is statistically significant at the $p < 0.001$ level.

The results show that PU ($p < 0.001$), PEOU ($p < 0.05$), SN ($p < 0.001$), SE ($p < 0.001$) and T ($p < 0.05$) all have a significant effect on IU. PU has the biggest significant effect with a beta coefficient of 0.435. PR has been found to have a non-significant effect on IU.

The tolerance values range between 0.638 and 0.914, while the VIF values range from 1.094 to 1.568; this provides evidence that there is no multicollinearity problem. Tolerance values should be close to 1, while VIF's should be below 5 and closer to 0 (Cohen, 2019).

Table 4-13 : Model summary for first multiple regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.650[a]	0,422	0,417	0,98496
a. Predictors: (Constant), CompositeT, CompositeSN, CompositePR, CompositePU, CompositeSE, CompositePEOU				

Table 4-14: ANOVA for first multiple regression

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	490,034	6	81,672	84,185	.000[b]
	Residual	671,343	692	0,970		
	Total	1161,378	698			

a. Dependent Variable: CompositeIU

b. Predictors: (Constant), CompositeT, CompositeSN, CompositePR, CompositePU, CompositeSE, CompositePEOU

Table 4-15: Coefficients for first multiple regression

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0,119	0,255		0,468	0,640		
	CompositePU	0,514	0,042	0,435	12,190	0,000	0,656	1,523
	CompositePEOU	0,098	0,043	0,082	2,270	0,024	0,638	1,568
	CompositeSN	0,135	0,030	0,138	4,561	0,000	0,914	1,094
	CompositeSE	0,181	0,042	0,152	4,309	0,000	0,673	1,485
	CompositePR	-0,038	0,026	-0,044	-1,428	0,154	0,871	1,149
	CompositeT	0,074	0,035	0,073	2,122	0,034	0,703	1,423

a. Dependent Variable: CompositeIU

4.5.2 Multiple regression analysis to determine Perceived Usefulness (PU)

The second multiple linear regressions analysed the relationship between the dependent variable Perceived Usefulness and the independent variables Perceived Ease of Use, Social Norms and Trust.

From the results below, R square is found to be 0.302, which means that the model explains approximately 30% of the variance in consumers intentions to use m-commerce, or more simplistically, the independent variables can account for 30% of consumers' intentions to adopt m-commerce. This is statistically significant at the $p < 0.001$ level.

The results show that PEOU ($p < 0.001$), SN ($p < 0.001$) and T ($p < 0.001$) all have a significant effect on PU. PEOU has the biggest significant effect with a beta coefficient of 0.402, followed by Trust with a beta coefficient of 0.175.

The tolerance values range between 0.810 and 0.949, while the VIF values range from 1.053 to 1.234. This provides evidence that there is no multicollinearity problem. Tolerance values should be close to 1, while VIF's should be below 5 and closer to 0 (Cohen, 2019).

Table 4-16: Model summary for second multiple regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.549[a]	0,302	0,299	0,91315
a. Predictors: (Constant), CompositePEOU, CompositeSN, CompositeT				

Table 4-17: ANOVA for second multiple regression

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250,459	3	83,486	100,122	.000[b]
	Residual	579,523	695	0,834		
	Total	829,982	698			
a. Dependent Variable: CompositePU						
b. Predictors: (Constant), CompositePEOU, CompositeSN, CompositeT						

Table 4-18: Coefficients for second multiple regression

Coefficients[a]								
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2,226	0,200		11,107	0,000		
	CompositeSN	0,120	0,027	0,144	4,434	0,000	0,949	1,053
	CompositeT	0,149	0,030	0,175	5,032	0,000	0,835	1,198
	CompositePEOU	0,407	0,036	0,402	11,421	0,000	0,810	1,234
a. Dependent Variable: CompositePU								

4.6 Conclusion

The focus of this chapter was threefold. Firstly to present the sample demographics, where the age, gender, education level. were presented. The results showed the 60% of the survey respondents were female and 71% were Black. Secondly, to analyse the measurement tool, where a Principle Components Analysis was conducted to measure the instrument's validity, followed by the Cronbach alpha test to measure the reliability of the scales. Lastly, to test the hypothesis, Pearson’s correlations were conducted, followed by multiple regression analysis. The table 4-19 gives a summary of the hypothesis results.

Table 4-19: Summary of hypothesis results

Hypothesis	Description	Result
H1	PU has a positive effect on consumers' IU m-commerce	Support
H2a	PEOU has a positive effect on consumers' IU m-commerce	Support
H2b	PEOU has a positive effect on consumers' PU of m-commerce	Support
H2c	PEOU has a positive effect on consumers' T towards m-commerce	Support
H3a	SN has a positive effect on consumers' IU m-commerce	Support
H3b	SN has a positive effect on consumers' PU of m-commerce	Support
H4a	SE has a positive effect on consumers' IU m-commerce	Support
H4b	SE has a positive effect on consumers' PEOU of e-commerce	Support
H5	PR has a negative effect on consumers' IU m-commerce	Reject
H6a	T has a positive effect on consumers' IU m-commerce	Support
H6b	T has a positive effect on consumers' PR toward m-commerce	Support
H6c	T has a positive effect on consumers' PU of m-commerce	Support

CHAPTER 5. DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the results of the study as they relate to the different constructs, highlighting the similarities and differences found between the study and existing literature. The discussion is broken up into the different constructs and their underlying hypotheses.

5.2 Perceived usefulness

This study found that there is a positive and significant relationship between PU and IU. Furthermore, PU was found to be the most important factor predicting consumers' intention to use m-commerce. This suggests that South African consumers care most about how useful a mobile shopping application is when considering whether to adopt m-commerce or not. This finding provides evidence that supports prior research on m-commerce adoption that also found PU to be the most significant factor contributing to consumers' intentions to adopt m-commerce (Khalifa & Shen, 2008b; Wang et al., 2006; Wei et al., 2009).

However, some studies have found the relationship between PU and IU to be non-significant (Chong et al., 2012; Zhang et al., 2012). Chong et al. (2012) conducted a study aimed at predicting Chinese and Malaysian consumers' decisions to adopt m-commerce. This study found that because Chinese and Malaysian consumers were no strangers to mobile devices, they had a fairly good idea of what m-commerce could offer, and therefore PU was not an important factor for them to consider when deciding whether to adopt m-commerce or not (Chong et al., 2012).

In South Africa, mobile phone penetration is not as high as it is in both Malaysia and China. There are 100.8 mobile phones per 100 Malaysians (Chong et al., 2012), while in South Africa, smartphone penetration is only projected to be 43% in 2023 (Statista, 2020). Therefore, it is not surprising that contrary to the findings by Chong et al. (2012) and Zhang et al. (2012), PU is an important predictor for m-commerce adoption amongst South African consumers.

Khalifa and Shen (2008b) postulate that intention to use decisions are driven by the utilitarian values linked to m-commerce. Thus, in the context of this study, it is apparent that the degree to which the respondents are willing to use m-commerce in the retail space is dependent largely on how useful they deem the m-commerce application. Therefore, to reap the benefits of m-commerce, businesses should focus on ensuring that they design applications that provide utilitarian value to the consumers, ultimately making the consumers' shopping experience useful, compared to other forms of shopping such as in brick and mortar stores.

This study also found PEOU to be significantly correlated with PU. This finding provides evidence supporting other studies on m-commerce adoption (Khalifa & Shen, 2008b; J. Sun & Chi, 2018; Q. Sun et al., 2009; Wang et al., 2006; Zhang et al., 2012). This means that, since PU is the most important factor determining m-commerce adoption amongst South African consumers, the focus should be on making m-commerce applications easy to use in order for consumers to deem the applications useful and consequently adopt m-commerce. Davis (1989) and Venkatesh and Davis (2000) found that the less effort was required to use a system, the more using it would improve job performance.

Finally, in line with prior research on m-commerce adoption (Gefen et al., 2003; Pavlou, 2003; J. Sun & Chi, 2018), this study also found that Trust had a positive and significant effect on Perceived Usefulness. This means that to improve how useful consumers deem m-commerce applications to be, retailers and developers ought to ensure that they build trustworthy applications.

5.3 Perceived Ease of Use

This study found that PEOU has a positive and significant effect on consumers' intentions to use m-commerce. This finding was consistent with previous studies that found PEOU to be a determining factor in the adoption of m-commerce (J. Sun & Chi, 2018; Q. Sun et al., 2009; Wang et al., 2006; Zhang et al., 2012). J. Sun and Chi (2018) found that Chinese consumers were more likely to adopt apparel m-commerce if they deemed it easy to understand.

While this construct has been studied extensively in the past, the results have not been consistent. Studies that have found the relationship between PEOU and IU insignificant suggest that the younger and more technologically 'savvy' consumers are, the less important ease of use is as a determining factor for the adoption of a particular technology or system (Chong et al., 2012; Khalifa & Shen, 2008b; Wei et al., 2009; Yadav et al., 2016). These consumers, it is inferred, are more likely to adopt m-commerce because they are already accustomed to using mobile phones and therefore learning to use m-commerce would be easier. Thus PEOU would not be a critical factor in deciding to use m-commerce.

In the context of this study, the consumers were relatively young, 56% were below the age of 25 years, while 82% were below the age of 35. However, these consumers found PEOU to be an important factor determining m-commerce adoption. This is perhaps because although the consumers were relatively young, smartphone penetration is still relatively low in South Africa, and thus, it can be inferred that South African consumers are not a technologically 'savvy' as other countries like Malaysia (Wei et al., 2009).

In South Africa, consumers deem it important for m-commerce applications to be easy to use. Retailers and software developers should ensure that mobile shopping applications are intuitive and easy to use in order to drive adoption and usage. As suggested by Davis (1989), all else being equal, the more a system is perceived as easy to use, the likelier it is to be adopted and used.

5.4 Social Norms

This study found that social norms have a positive and significant effect on consumers' intentions to adopt m-commerce. This suggests that South African consumers are influenced by the views and opinions of family members, friends and the media when it comes to adopting m-commerce. The findings emerging from this research support the findings from past literature on m-commerce adoption (Chong et al., 2012; Khalifa & Shen, 2008a, 2008b; Lai & Lai, 2014; J. Sun & Chi, 2018; Venkatesh & Davis, 2000; Wei et al., 2009; Yadav et al., 2016; Zhang et al., 2012).

Chong et al. (2012) found that social influence was an important determinant for m-commerce adoption in both Malaysians and Chinese consumers and that consumers were much more prone to being influenced by mass media and peers to adopt m-commerce (Chong et al., 2012; Wei et al., 2009). Yadav et al. (2016) observed that the younger generation was predisposed to be socially influenced. This would explain this study's finding since most of the respondents were students between 18-24 years old.

It was also hypothesised that SN would positively affect PU, and this hypothesis was supported. This finding was supported by previous studies which also found the relationship between SN and PU, significantly positive (Khalifa & Shen, 2008b; J. Sun & Chi, 2018; Venkatesh & Davis, 2000; Zhang et al., 2012). This means that friends, family and mass media will influence how useful a consumer perceives the m-commerce application to be.

5.5 Self-efficacy

It was found that self-efficacy has a positive and significant effect on consumers' intentions to adopt m-commerce. This suggests that for consumers to adopt m-commerce, they need to feel that they have the skills required to use m-commerce applications. This finding provides evidence that supports past m-commerce adoption literature (Khalifa & Shen, 2008b; Q. Sun et al., 2009; Wang et al., 2006).

This study found that 99% of the respondents own a smartphone, and therefore, it can be expected that they have the skill required to shop on their mobile device. This would make these consumers more likely, all else equal, to adopt m-commerce and, more specifically, m-shopping.

5.6 Perceived Risk

This study found the relationship between perceived risk and consumers' intentions to use m-commerce to be negative and insignificant. This is contrary to previous studies on m-commerce that have found this relationship significant (Hong & Cha, 2013; Kim et al., 2008; Pavlou, 2003). This finding suggests that in the South African context, consumers did not perceive risk as being an important

deterrent to the adoption of m-commerce. There are clearly other more salient factors consumers would deem an inhibitor to m-shopping adoption.

This finding could be as a result of the consumers being relatively young and therefore less risk averse than the older generation (Albert & Duffy, 2012), with 82% of the respondents being below the age of 35 years old.

M-commerce and m-shopping, unlike traditional physical stores, presents the consumer with a lot of uncertainty and different types of risk such as financial risk, privacy risks, performance risks, etc. Theoretically, it seems plausible that the more a consumer perceives high risk involved in a m-commerce transaction, the less likely they are to adopt m-shopping (Wu & Wang, 2005). However, this does not hold true for South African consumers.

5.7 Trust

It was found that trust has a positive and significant effect on consumers' intentions to adopt m-commerce. This means that, for the adoption of m-commerce and m-shopping to grow in South Africa, consumers need to trust not only the merchants offering the products and services, but the application and platforms through which they make m-commerce available. The effect of trust on consumers' intentions to adopt m-commerce has been researched extensively in the past, and the findings from most of the research suggest that trust impacts consumers' intentions to use m-commerce (Chong et al., 2012; Kim et al., 2008; Pavlou, 2003; Wei et al., 2009; Yadav et al., 2016). However, some studies have found this relationship not significant (J. Sun & Chi, 2018).

Chong et al. (2012) studied the impact of trust on consumers' intentions to adopt m-commerce in Malaysia and China, and found that trust was a determining factor for m-commerce adoption in both countries. Consumers in both countries were found to be concerned about the privacy and security offered by m-commerce and did not trust transactions that lacked physical contact (Chong et al., 2012).

The challenges posed by m-shopping differ from those posed by brick-and-mortar stores in that, firstly, consumers are expected to purchase products and services from unknown merchants, where there is no human interaction and secondly, without actually seeing or touching the product (Hong & Cha, 2013). Consumers need to trust that the merchant will not act in a way that is opportunistic and harmful towards them (Hong & Cha, 2013).

Lastly, Perceived Ease of Use was also found to be significantly affected by Trust. This is consistent with some prior research on m-commerce adoption (J. Sun & Chi, 2018; Wang et al., 2006). J. Sun and Chi (2018) found that Chinese consumers are likely to trust m-apparel applications if they are easy to use. Thus, in South Africa too, m-commerce sites should be designed in such a way that they are easy to use to ensure that consumers can trust the applications and ultimately, adopt m-commerce.

CHAPTER 6. CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter summarises the findings as they relate to the different hypotheses and their overarching research objectives, provides recommendations, and highlights the study's limitations. Lastly, it provides suggestions for future research.

6.2 Summary of sample

A total of 806 responses were received, and only 699 were completed and considered for further analysis. 60% of the respondents were male, and 71% of the respondents were African. 82% of the respondents were below the age of 35 years. 99% of the respondents had a smartphone, and only 12% reported never having used a mobile device to shop. 87% of the respondents indicated that they used it for both social media and banking outside of using their mobile devices for shopping.

6.3 Conclusion of study

The purpose of this study was to examine the factors that influence and/or inhibit consumers from using m-commerce, specifically m-shopping applications in South African retailers. The Technology Acceptance Model was adopted and extended to include additional constructs: social influence, self-efficacy, perceived risk, and trust. These constructs were adopted from prior research in m-commerce adoption.

The following section give a brief summary of the findings of the research hypotheses as they relate to the research objectives of the study.

Research objective 1: *To examine the effect of the TAM constructs on South African consumers' intentions to use m-commerce.*

The TAM constructs, namely, PU and PEOU were examined, and the study found a positive and significant relationship between PU and IU. In addition to this, PU was found to be the most significant factor influencing consumers' intentions to adopt m-commerce. PEOU, Social Norms and Trust had a positive and significant effect on PU and are therefore important considerations for retailers when designing m-commerce customer experiences centred around PU. Lastly, PEOU also had a positive and significant effect on IU. As such, H1, H2a, H2b, H3b and H6c were supported.

Research objective 2: *To examine the role that social influence has on the consumers' intention to adopt m-commerce*.

The study found that social norms have a significant and positive effect on consumers' intentions to adopt m-commerce. Thus, hypothesis H3a was supported. This suggests that South African consumers are influenced by their friends and family members to adopt m-commerce. Social norms was also found to have a significant and positive effect on PU, suggesting that the respondent's friends and family influenced consumers' perceptions around the usefulness of m-commerce. Thus, H3a was supported.

Research objective 3: *To examine the role that self-efficacy has on the consumers intention to adopt m-commerce*.

Self-efficacy was found to have a positive and significant effect on consumers' intentions to use m-commerce. This finding supports hypothesis 4a, which states that Self-efficacy will positively affect consumers' intentions to adopt m-commerce. Self-efficacy was also found to have a positive and significant effect on PEOU, and therefore H4b was also supported.

Research objective 4: *To examine the extent to which perceived risk deters consumers from adopting m-commerce*.

Perceived Risk was the only factor whose hypothesis was rejected. It was hypothesised that PR has a negative effect on consumers' IU m-commerce.

However, no relationship was found between PR and IU in the South African context. Thus, H5 was not supported. However the effect that Trust has on perceived risk was positive and significant, and therefore H6b was supported.

Research objective 5: *To examine the role that trust plays in consumers' intentions to adopt m-commerce.*

Lastly, Trust was found to have a positive and significant effect on consumers' intentions to use m-commerce. Consumers had to trust the m-shopping platform in question in order to consider adopting it. The study also found that consumers' perceptions of the ease of use of m-shopping applications affected whether they trusted the application. PEOU had a positive and significant effect on Trust. Therefore, H6a and H2c were supported.

Overall, this study's findings were consistent with past literature, except the finding of the effect of perceived risk on consumers' intentions to use m-commerce.

6.4 Recommendations

This study aimed to examine the factors that drive and influence consumers to adopt m-shopping applications and use the findings emanating from the study to provide retailers and marketers with insights they can use when developing m-shopping strategies to ensure that consumers adopt their Apps (mobile applications).

The study found PU to be the most significant factor predicting consumers' intentions to use m-shopping applications. PU relates to the extent to which consumers believe that using a particular m-shopping application would improve or enhance their shopping experience. Therefore, when designing mobile shopping applications, retailers need to ensure that they are building mobile applications that will offer consumers benefits that far outweigh shopping in a brick-and-mortar store. The m-shopping applications are to be designed reliably, affording consumers any time, anywhere accessibility, and ensuring that

consumers have access to any information they require regarding their m-shopping engagement.

Further to this, retailers should focus on ensuring that the m-shopping application is easy to use and intuitive. The findings suggest that when consumers perceive the m-shopping application to be easy to use, they are also likely to deem it useful. Thus, retailers should ensure that it's easy to find items and information thereof and that it's easy to make payments and the returns and refunds processes are easy to follow.

The research findings suggest that South African consumers are influenced by family, friends, celebrities, influencers, etc. to adopt m-shopping applications. Therefore, when crafting marketing strategies to ensure adoption, marketers should leverage influencers to drive awareness and adoption, using social media platforms like Instagram and TikTok. In addition to that, marketers should consider incentivising consumers for referrals and word-of-mouth since social influence is an important adoption factor amongst South African consumers.

Lastly, retailers should ensure that m-shopping applications are trustworthy. The m-commerce platforms should not compromise consumers' security and privacy. The retailers should ensure that there are controls in place prohibiting the unauthorised use of consumers' personal information such as credit card details, contact details, home address. In ensuring that consumers trust the retailer, the focus should be both on the retailers' brand and the system or technology facilitating the m-commerce transaction.

6.5 Potential contribution to the research on m-commerce

M-commerce is still in its infancy in South Africa, and as such, research in this domain is still emerging. Therefore, this study could be a potential contribution to the body of knowledge of m-commerce adoption in South Africa. This study also confirms the relevance and suitability of TAM as a basis to understand consumers' intentions to adopt m-commerce, although the tool is insufficient on its own. Therefore, the extension of this tool to include additional constructs

such as social norms, self-efficacy, and trust is a potential contribution to m-commerce research in the South African context.

6.6 Suggestions for future research

The sample constituted Wits University students predominantly, and 82% of the respondents were below the age of 35 years. Therefore, this sample may not be a true reflection of the South African population. It is suggested that future studies focus on a broader sample frame that is distributed across the working professionals, students, pensioners and that represents other regions of the country to ensure that it is more representative of the country.

In addition, not all the m-commerce adoption factors were considered for this study. Some of the other factors that have been covered in other similar studies include perceived cost and perceived enjoyment, amongst other factors. Therefore future research should focus on including additional adoption factors that may influence m-commerce adoption.

The study adopted a quantitative research methodology. This methodology does not allow the researcher to explore the consumers' fundamental beliefs and assumptions and gain a full appreciation of the variables being measured. Therefore, further research should incorporate qualitative insights and thus, a mixed methodology is recommended for future studies.

Lastly, this study aimed to understand the factors that influenced consumers and not businesses, meaning that the focus was on Business-to-consumer. Further research can focus on understanding the factors that influence businesses to adopt m-commerce strategies, specifically trying to understand the adoption factors that influence businesses to adopt m-commerce as a sales channel.

6.7 Conclusion

This chapter provided a summary of the sample demographics as well as the results of the study as they relate to the research objectives. The total number of responses received was 806, however, only 699 were complete and therefore

used for further analysis. The respondents were 60% male, and 71% were black. All the hypotheses were supported and were consistent with prior research, except H5, which was rejected and inconsistent with past literature. PU, PEOU, Social norms, self-efficacy and trust all had a significant and positive effect on consumers' intentions to use mobile commerce, while the relationship between perceived risk and consumers' intentions to use was insignificant. Therefore, the research objectives of this study were met. It is recommended that in order to develop successful m-commerce strategies, retailers, marketers, and developers should focus on ensuring that they design m-commerce applications that offer consumers compelling benefits compared to traditional brick-and-mortar stores and that consumers perceive the m-commerce applications to be easy to use. It is also recommended that marketers leverage social media and word-of-mouth to get consumers to adopt m-commerce since social norms are a significant determining factor for m-commerce adoption. Future research should focus on using a broader sample that is more representative of South Africa's population, include more factors that influence m-commerce adoption and employ a mixed methodology to gain qualitative insights and a deeper undertstanding of the underlying consumer drivers for m-commerce adotion.

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APPENDIX A: RESEARCH INSTRUMENT

Good day

My name is Millicent Raikane, a Wits Business School student enrolled for the Masters of Management degree in the field of Digital Business.

As part of my masters degree, I am conducting research that seeks to understand the factors that influence the adoption of mobile-commerce, specifically mobile shopping applications amongst South African consumers in the retail industry.

I would like to invite you to take part in a self-administered online questionnaire. It will take approximately 5 minutes and will be completely anonymous. The results of the questionnaire will be used solely for academic purposes.

By proceeding to the next page you grant the researcher consent to include your responses in the research.

Thank you in advance for your participation.

→

Gender

- ◯ Male
- ◯ Female

Race

- ◯ Black
- ◯ Coloured
- ◯ Indian
- ◯ White
- ◯ Other

Age

- ◯ 18 - 24
- ◯ 25 - 34
- ◯ 35 and above

Level of education

- ◯ Student
- ◯ Undergraduate degree
- ◯ Postgraduate degree
- ◯ Masters degree
- ◯ Professional degree

Which of these mobile devices do you own (You can select multiple answers)

- ☐ Smartphone
- ☐ Tablet
- ☐ Wearables e.g smart watch
- ☐ None

Do you shop on any of your mobile device/s?

- ◯ Never
- ◯ Seldom
- ◯ Sometimes
- ◯ Often
- ◯ Always

What do you shop for? (You can select multiple answers)

- ☐ Groceries
- ☐ Fashion
- ☐ Electronics
- ☐ Books
- ☐ Entertainment & ticketing
- ☐ I don't shop on my mobile device

Which of these shopping applications have you used? (You can select multiple answers)

- ☐ Takealot
- ☐ Superbalist
- ☐ Zando
- ☐ Zara
- ☐ Woolworths

What else do you use your mobile phone for? (You can select multiple answers)

- ☐ Banking
- ☐ Social media

→

Intention to use

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I intend to start shopping on my mobile device more frequently	○	○	○	○	○	○	○
I believe my interest towards mobile shopping will increase in the future	○	○	○	○	○	○	○

Perceived usefulness

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Shopping on my mobile device is more useful than going to the store	○	○	○	○	○	○	○
Shopping on my mobile device saves me time	○	○	○	○	○	○	○
Using mobile shopping applications allows me to do my shopping conveniently	○	○	○	○	○	○	○

Perceived ease of use

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I find it easy to locate information and products on mobile shopping platforms	○	○	○	○	○	○	○
Mobile shopping is understandable and clear	○	○	○	○	○	○	○
Finding what I'm looking for through mobile shopping platforms is easy	○	○	○	○	○	○	○
I find it cumbersome to shop using my mobile device	○	○	○	○	○	○	○

Social norms

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I would shop using my mobile device because celebrities and social media influencers do it	○	○	○	○	○	○	○
I would shop using my mobile device because my friends and family do it	○	○	○	○	○	○	○
My friends and family think I should engage in mobile shopping	○	○	○	○	○	○	○
Many people I know shop on their mobile devices	○	○	○	○	○	○	○

Self-efficacy

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I would feel comfortable shopping on my device on my own	○	○	○	○	○	○	○
If I wanted to, I could easily use mobile shopping platforms on my own	○	○	○	○	○	○	○
I wouldn't use mobile shopping on my mobile device unless someone showed me how to use it	○	○	○	○	○	○	○

Perceived risk

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I think shopping on my device puts my privacy at risk	○	○	○	○	○	○	○
I think mobile shopping poses the risk of my products not being delivered	○	○	○	○	○	○	○
I think mobile shopping presents the risk of getting low quality products	○	○	○	○	○	○	○

Trust

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
I trust that payments will be processed securely when I shop on my mobile device	○	○	○	○	○	○	○
I believe that transactions conducted on mobile shopping platforms will be secure	○	○	○	○	○	○	○
I trust that my personal information will be kept safe and confidential while I shop on my mobile device	○	○	○	○	○	○	○

→

APPENDIX B: ETHICS CLEARANCE

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: WBS/BA454666/345**
PROJECT TITLE	Critical factors that drive and influence consumer intentions to use m-commerce in retail stores in South Africa
INVESTIGATOR	Ms Millicent Raikane
SCHOOL/DEPARTMENT OF INVESTIGATOR	MM (Digital Business)
DATE CONSIDERED	18 August 2020
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	MINIMAL RISK
EXPIRY DATE	30 JUNE 2021

ISSUE DATE OF CERTIFICATE 31 August 2020

CHAIRPERSON _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Ms Ayanda Magida

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

_____ 04 / 09 / 2020

Signature **Date**

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