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MOBILE PAYMENTS IN SOUTH AFRICA: MIDDLE INCOME EARNERS' PERSPECTIVE

Completed Research Paper

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Abstract

Developing countries in Africa tend to face many challenges when it comes to ICT adoption and use. This is partly due to their low income which makes it difficult to spend on ICTs and related innovations. However, with the proliferation of mobile technology and the newly increase of the middle class citizens who tend to be younger, better educated, and a keen adopter of new technologies; organizations are forced to find ways of understanding these customers better and find how best they can provide goods and services to this emerging class. South Africa, one of the sub-Saharan countries with the most advanced telecommunication network infrastructures of the emerging markets, has experienced an increase in middle class citizens and comparatively better smartphone penetration. With this in mind, one would imagine that South Africa would have been one of the leaders in mobile payments. However, adoption has been lower than most other sub-Saharan African countries. The purpose of this study is therefore to examine the factors that affect mobile payments in the South African context from perspective of the middle class individuals. Following a quantitative approach and collecting data via an online questionnaire, the findings show that trust, risk and habitual use were factors that significantly affected intention to adopt mobile payments by South African middle class citizens. The findings provide the financial services industry and providers of mobile commerce offering with a better understanding of what are the main customer concerns in South Africa from the middle income clientele perspective.

Keywords: Mobile payments, Adoption, middle income, developing countries

INTRODUCTION

The proliferation of mobile devices in developing countries, and in Africa in particular has changed the way people, businesses and even institutions interact. From a business perspective, mobile devices have aided the process of doing businesses by providing new ways of monetary exchange – that of using one’s mobile device to make payment. In doing so, mobile devices have become an inclusive tool for those who are unable to access the formal banking institutions to participate and exploit the financial economy. The mobile device, allows one to have mobile money – which can be used to perform financial transacting activities such as paying for goods and services, paying bills, transferring money from person to person (P2P), banking functions and a store of financial value (Mulwa et al. 2015). Although mobile money can serve several purposes, this study focuses on the use of a mobile device to perform a financial exchange – that of payment of good and services. This is commonly referred to as mobile payments (Shaw, 2015). Several studies have, and continue to examine the mobile payment phenomenon with the intent of understanding user acceptance of mobile payment.

This is because the success of mobile payment in various contexts do differ. For example, Suárezi (2016) reports that in Kenya more than 50 per-cent of the population uses mobile payments platforms whilst in Mexico the proportion is barely above 2 percent – even though both countries are regarded as developing nations. Understanding these disparities has become one of the focuses of many scholars.

On the African continent, several studies have examined this phenomenon of mobile payments. Munyegera and Matsumoto (2016) examined the phenomenon among households in Uganda. Stepcic and Kabanda (2016) investigated the mobile payment from SME perspectives in the Kenyan retail sector. In South Africa, Jenkins and Ophoff (2016) examined the factors influencing the intention to adopt near-field communication mobile payments; and Gbongli et al (2016) focused on the risks associated with mobile banking in West Africa. These studies show how much the phenomenon has received attention across the African continent. Although these studies provide significant contribution towards understanding mobile payments, no study, at least in the African context has examined the phenomenon from the perspective of middle-income earners who are on the rise in most countries, specifically in Kenya and South Africa because of urbanization (Weatherspoon & Reardon, 2003). The South African context is unique. In early 2016, smartphone penetration stood at 37% (Poushter, 2016) and the country has one of the most advanced telecommunication network infrastructures of the emerging markets (Joubert & Belle, 2013). Yet, adoption has been lower than most other sub-Saharan African countries with mobile payment accounts estimated to be at about 7.8% of total subscribers compared to Zimbabwe's 50% even though South African has up to a third of all mobile subscriptions in sub-Saharan Africa and was predicted to have 50% of all 4G mobile data users by 2020 (GSMA, 2015). It seems mobile payment, as an innovation has not been adequately understood and received in the South African context amidst the increasing size of middle class citizens who, according to Visagie and Posel (2013) are those characterized by absolute affluence and lifestyle approach, and fall into occupations such as managers, legislators, professionals, technicians, and clerks. Burger et al (2014), associates middle class with their income, education and self-identification. This increase in the middle class of African descent (Businessstech 2015), provides a new opportunity of understanding the mobile phenomenon in the African context that has traditionally been associated with poverty and extreme low-income earners. According to Harry et al (2014), for one to understand mobile payment, one needs to zoom in on the middle class; especially in emerging economies where keen adopters tend to be younger, better educated, and higher earning males (Cruz et al, 2010). With this in mind, the purpose of this study is therefore to examine the factors that influence mobile payment adoption amongst the middle class in South Africa. A quantitative approach was deemed appropriate to be able to have a significant pool of data that can be generalizable to the South African context. Data collection was through a self-administered online questionnaire.

The rest of the paper is structured as follows: The next section will provide a literature review on mobile payment, specifically from a developing country context. This is followed by the discussion of the research approach, paying attention to how the data was collected and analyzed. Then, the field research findings are documented in the following section. An extrapolation of the field research findings in the context of the literature is made in the following section. The last part of the paper concludes and provides recommendations and future research work related to this study.

CONCEPTUAL BACKGROUND

Mobile payments

Developing countries and those in Africa in particular are boasting of mobile phone penetration. According to Lee et al, (2012, 461), “the contribution of mobile cellular phones to economic growth has been growing in importance in the Sub Saharan region and the marginal impact of mobile telecommunication services is even greater wherever land line phones are rare. One of the advantages of mobile phone penetration has been in the increase in mobile payments transactions as demonstrated by Figure 1. According to Deloitte (2013), we should expect more mobile transactions in the future due to the NFC technology, especially in the developed economies where concerns of security are more prevalent to the hindrance of adoption. Mobile-payment smartphone apps powered by near-field communication technology will allow consumers to pay for purchases in retail locations by tapping their phones on a point-of-sale device at the register.

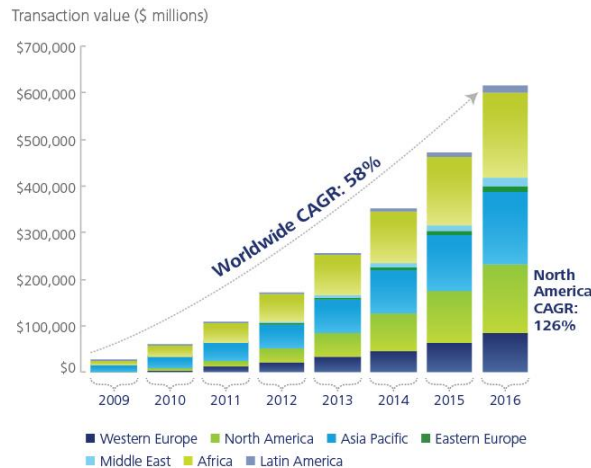


Figure 1: Mobile payments transaction value by region, global (2009-2016)
 (<https://dupress.deloitte.com>)

Asia Pacific has traditionally been the leader in mobile payment adoption (with New Zealand at 44% and China at 30%); and Africa, where the nascent technology isn't competing with a long-established banking system following suit (Soat 2014). However, the majority (70%) of African mobile payment comprise of person-to-person payments. Alternatives such as Quick Tap are not prevalent or known (Stepic and Kabanda 2016) and if introduced, "retailers will need to ensure that they have an application across many different platforms including iPhone, Android, Symbian and so on if they are to support the different NFC transaction systems that are inevitably going to start cropping up, as seen with the Google Wallet" (<http://www.kony.com/resources>). Several challenges have been associated with this. Most countries do not have adequate telecommunication infrastructure for mobile commerce and they lack an appropriate legal framework and policy for regulating mobile payment systems. As a response to the legislation and regulation problem, Uganda which currently has no legislation governing mobile money services is in the process of developing partnership guidelines between a telecommunication company and a financial institution to be followed prior to the licensing of a mobile money service, with the intention of ensuring that Banks can protect the monetary value of the mobile transactions through appropriate regulation (Gutierrez & Choi 2014).

Other countries like Niger still face additional problems of mobile money registration and usage and as a consequence, electronic transfers in these countries does not necessary lead to improved financial inclusion for all as proponents suggest. In these contexts, "substantial investment to register clients and agents would be required to establish mobile payment systems" (Aker et al., 2014,29). Finally, socio cultural aspect of mobile commerce have been examined and the findings show that issues of cultural practices can affect how individuals perceive mobile commerce. For example, Said (2009) and Kabanda and Brown (2015) find that African businesses perceive electronic transactions and banking to be against their cash based economy practice. This has led researchers to debate on the characteristic features that should go into the design of mobile money application(s) to embody a contextual community's money practices in social (marriage and death) and religious contexts (Mesfin et al 2016). According to the recent report by Mastercard (2012a), South Africa's Mobile Payments Readiness Index ranks below Egypt, Nigeria and Kenya in Africa, at 29.1 (see Table 1). The Mobile Payments Readiness Index is used to gauge markets' preparedness for mobile payments in three varieties: mobile at point of sale (POS), mobile commerce (m-commerce), and person-to-person funds transfer (P2P). In Table 1, it is worth noting that despite South Africa's relatively low population, high GDP, GDP per capital, and network readiness index - which represents a countries' preparedness to reap the benefits of emerging technologies and capitalize on the opportunities presented by the digital transformation and beyond (Baller et al., 2016,3); the country stands with the lowest mobile payment readiness index. Factors associated to this include the lack of partnerships between banks, telcos, and payments companies; the lagging infrastructure and overall environment scores. For example, whilst 70% of Nigeria consumers are more willing to use mobile payments, despite the country lacking many of the sufficient conditions for a vibrant mobile payments market; only 26% of South Africa consumers are willing to do the same even though the environment offers better a telecommunication infrastructure than Nigeria. Thus "conditions on the ground, such as a stable telco network, established financial services, and progressive regulation, do not ensure consumer readiness—the one essential variable—in any given market" (Mastercard 2012b, 1). Thus, the lower mobile payment

readiness index has translated in few of South African businesses being ready for mobile commerce despite high adoption levels of mobile phone in the country (Fin24tech 2015). Despite these challenges, a significant percentage (43%) of businesses do sell to customers online and as of 2012, the three most common mobile payments transactions were Airtime, Mobile money transfer to other users and Mobile banking (notifications and account access) (worldwideworx, 2012). On average, there is a greater degree of willingness from consumers to use mobile payments in all three mobile payment types—P2P (person-to-person) POS (point-of-sale transactions), and m-commerce with P2P payments receiving the highest rating (26 percent) (MasterCard 2012a). Most of these users tend to be aged 18 to 49 and are high - and medium income earners.

	South Africa	Egypt	Nigeria	Kenya
Population	48,810,427	83,688,164	170,123,740	43,013,341
GDP	\$554.6 Billion	\$515.4Billion	\$414.5 Billion	\$71.5 Billion
GDP per Capital	\$11,000	\$6,500	\$2,600	\$1,700
Mobile ownership	92%	99%	99%	98%
Mobile Readiness index	29.1	30.2	31.3	40.4
Mobile Index average	33.2	33.2	33.2	33.2
Networked Readiness Index	4.2	3.7	3.2	3.8
Network Readiness Index ranking position	65	96	119	86

Table 1. Mobile Payment readiness index

Conceptual framework

Mobile payments have received significant attention in literature to date with most researchers attempting to understand what factors influence users to adopt mobile payments. Several theoretical perspectives have been adopted in this regard ranging from the most common technology acceptance model (TAM) to a more comprehensive Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT was originally developed to explain employee acceptance and use (Venkatesh et al., 2012). It is a blend of the technology acceptance model (TAM), innovation diffusion theory (IDT), the motivational model (MM), theory of reasoned action (TRA), theory of planned behaviour (TPB), combined TAM and TPB (C-TAM-TPB), model of PC utilization (MPCU) and social cognitive theory (SCT) (Venkatesh et al., 2003). UTAUT has four main constructs: Performance Expectancy, Effort Expectancy and Social Influence, and facilitating conditions. These constructs are moderated by gender, age, experience and voluntariness of use (Sanakulov & Karjaluoto, 2015). Performance Expectancy is the notion of level of advantage a user gains by using a system to achieve a task; and is usually measured through perceived usefulness, extrinsic motivation and outcomes expectations. Performance Expectancy is moderated by age and gender. Effort Expectancy is the level of ease related with using a system, and is usually understood through the assessment of an individuals perceived ease of use, complexity, and ease of use. Gender has been identified as an influencer of effort expectancy as women were found to place a greater importance on effort expectancy than men. Effort Expectancy is also moderated by age this is because as people get older it can become difficult to perform tasks. For example, in the U.S., the biggest growth in mobile payments adoption, by age group, was registered among younger consumers between 18 and 29 years old, 24 percent of whom have now used m-payments (Federal Reserve 2013). This age group is perceived to have a “a strong appetite for new technologies” (pwc 2016). Also training and experience were found to influence effort expectancy (Venkatesh et al., 2003). UTAUT stipulates that an individual’s values and how other people believe the individual should behave is an important factor to consider when studying adoption of an innovation (Nysveen et al., 2005). It has been reported in literature that females and males have been found to react differently to social influence with females putting more importance on social influence. A users age also affects Social Influence with older users putting more importance on Social Influence but this diminishes with an increase in experience (Venkatesh et al., 2003). Thus, the construct of social influence is typically moderated by Age, Gender and Experience.

Venkantesh et al (2012) enhanced the original UTAUT model to include constructs of Hedonic Motivation, Price Value, and Habit. Hedonic Motivation is the perceived enjoyment a user will experience when using a system. It is influenced by experience, gender and age. As a user becomes more familiar with an application their experience increases and the application experience tends to move from a fun novelty to a more utilitarian tool and thus the Hedonic Motivation decreases. The Price Value is a representation of the user’s compromise between the perceived benefits of the application versus the monetary cost of using the application (Dodds et al., 1991). It is positive when

the perceived benefits of using the technology outweigh the monetary cost and has been found to have positive impact on the Intention to Use. According to Venkatesh et al. (2012), females tend to be more price sensitive than males and over time the price sensitivity can change given a female changing needs such as adjusting consumption habits to take into consideration a family. Finally, the Habit construct of UTAUT2 refers to the degree to which the user atomically interacts with the mobile money system based on past experience (Limayem et al, 2004). Habit is usually considered as prior behaviour and is measured as the level the user deems his or her behaviour to be automatic (Venkatesh et al., 2012). Experience, age and gender are the moderators of Habit.

Slade et al. (2013) customized UTAUT2 specifically to study the adoption of m-payments by adding two additional constructs of Trust and Risk. They argue that Trust and Risk have been two of the main deter-mining factors when adopting mobile payments. According to Laforet and Li (2005) perceived risks was the main deterrents of the adoption of internet banking in China. In India, the construct of Perceived Risk, Security and Privacy Risk outweighed the Monetary Risk (Thakur & Srivastava 2014). Joubert and Belle (2013) examined trust and risk in early adopters in of mobile payments in South Africa and their results show that risk did not play a significant part in adoption but system trust had a noticeable effect on adoption. According to Lu et al. (2011) trust has a strong role to play in mobile adoption due to the uncertainty and loss of control that may be experienced when performing financial transactions with mobile devices. There are three categories of risks which have been found to have an effect on adoption of new mobile technologies: (1) security risk, (2) performance risk and (3) financial risk (Yiu et al, 2007). User’s perceptions of risk are usually related to their feelings of uncertainty or anxiety towards the behavior and the severity of the possible out-comes resulting from the behavior. Users of mobile money may experience perceptions of risk of vulnerability in the case of security such as security breaches or identify-ty theft (Slade et al., 2013). Laforet and Li (2005) found that security was one of the strongest factors consumers consider when adopting mobile money products. Risk has been found to affect younger and older users differently with younger users being more keen adopters of embracing technologies sooner suggesting that younger users are less concerned about the perceived risks (Slade et al., 2013). The risk is also handled differently between genders. Van Slyke et al (2002) observed that by reducing the perception of risk female’s perception of online shopping improved. Based on this Slade et al. (2013) included gender as a moderator for Risk in the extended UTAUT2 model. Based on the literature, a set of hypothesis were identified as shown in Table 2.

Hypothesis	
H1	The effect of Trust on Behavioral Intention (BI) will be negative and moderated by age, gender and experience
H2	The effect of Perceived Risk (PR) on Behavioral Intention (BI) will be negative and moderated by age, gender and experience
H3	The effect of Performance Expectancy (PE) on Behavioral Intention (BI) will be positive.
H4	The effect of Effort Expectancy (EE) on Behavioral Intention (BI) will be negative.
H5	The effect of Social Influence (SI) on Behavioral Intention (BI) will be positive.
H6	The effect of Facilitating Conditions (FC) on Behavioral Intention (BI) will be positive and moderated by age, gender and experience.
H7	The effect of Hedonic Motivation (HM) on Behavioral Intention (BI) will be positive and moderated by age and gender.
H8	The effect of Price Value (PV) on Behavioral Intention (BI) will be positive and moderated by age and gender.
H9	The effect of Habit (H) on Behavioral Intention (BI) will be positive and moderated by age, gender and experience

Table 2. Set of hypothesis

These constructs were perceived appropriate not only because they have been used to study the phenomenon in other contexts, but also because in the South African context, there is an increase in the African middle class who are younger and more affluent and who have the propensity to be active drivers of the growth in electronic payments (pwc 2016). Such consumers, who will move to the next age level over the next ten years and continue to transact online, thus increasing the percentage of active users can become drivers for new consumer demands (Visagie 2013, pwc 2016) such as alternative mobile payment methods. Although middle class African consumers are still not as demanding as what you might find in other economies such as the US or Europe, there is a noticeable trend towards higher service levels because “they have increased exposure to many options, rather than relying on the most broadcasted company that holds a monopoly in a given sector....they are looking for appropriate technology to save them time on “mundane stuff” (<http://newafricanmagazine.com/11558-2/>). These characteristics can potentially affect their intention to adopt new technologies.

METHODOLOGY

The study follows a positivistic philosophy, which rejects the notion of consciousness and humanly created meanings that is common with interpretivist studies (Ngwenyama & Lee, 1997). Following a deductive approach, and using the set of hypothesis in Table 2, a research instrument was designed. The research instrument was structured as follows: Section A consisted of basic profile information and middle class establishment, which elicits the demographic information of the respondents. The middle class was established by using a mix of Visagie and Posel’s (2013) absolute affluence and lifestyle approach. Other metrics of how to measure middle class in South Africa mentioned by Burger et al (2014), were included. Section B sought information on the theoretical framework constructs of Slade et al’s. (2013) extended UTAUT2 model. The constructs of the model are Trust, Risk, Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value and Habit.

Participants were identified using Burger et als (2014) definition of middle class citizens which require each individual to self-identify themselves as such. Data was collected via Qualtrics - an online surveying tool. An email, inviting participants to the study was sent to the research practitioners personal and professional email address lists. The invitation was also posted on multiple social networking websites such as the research practitioners LinkedIn profile, Twitter handle and various 8 Facebook groups which have a high number of members. The survey ran for 36 days from 19 June to 24 July 2016 and received 127 responses. Data was extracted from Qualtrics and imported directly into SPSS. The data was checked to ensure the extract and import was a success and that the integrity of the data had been maintained. This was achieved by comparing the number of respondents in Qualtrics to the number of respondents that reflected in SPSS. After sanitising the data by removing test cases completed by the research practitioner and removing blank or abandoned cases, 125 responses were available for analysis from the initial 127 responses this included the replacement of missing values with predicted values using expected values for 21 cases. Littles missing completely at random (MCAR) test was first conducted to ensure missing values where random enough (Acock, 2005). The data was further filtered on whether respondents self-identified as middle class and if they lived in South Africa, resulting in a usable dataset of 117 respondents. Kolmogorov-Smirnov and Shapiro-Wilk tests were conducted to determine if the results were normally distributed. The results show that in both tests all measured constructs are statistically significant. Cronbach’s Alpha test was implemented to test for the reliability of the items (Table 3). The findings show that the Risk item measured highest with a Cronbach’s Alpha of 0.917. Effort Expectancy and Habit also scored well with a Cronbach’s Alpha of 0.875 and 0.804 respectively. All other items are acceptable with a Cronbach’s Alpha of above 0.7 and therefore confirming that they have shared covariance. However, items Facilitating Conditions and Price Value scored low with an unacceptable Cronbach’s Alpha of 0.582 and 0.525 respectively.

Construct	Cronbach’s Alpha	No. Items
Trust (T)	0.727	2
Risk	0.917	7
Performance Expectancy	0.785	3
Effort Expectancy	0.875	4
Social Influence	0.762	4
Facilitating Conditions	0.582	2
Price Value	0.525	2
Habit Motivation (HM)	0.804	2

Table 3: Cronbach’s Alpha reliability

RESULTS

Spearman’s rho rank correlation coefficient was used to analyses the latent variables. The findings show that all constructs have a statistically significant relationship ($p < 0.01$) with BIU as depicted in Table 4. We see that habit has a very strong relationship with intention to use followed by hedonic motivation and performance expectancy. The Mann-Whitney U test was also conducted (see Table 5-8). The findings show that gender has an influence on perceptions of risk (RiskV), Intention to Use (IU), Behavioral Intention to Use (BIU), Trust (TR2) and Habit (H2). Findings also show that one’s experience has a strong effect on all the constructs except Social Influence (SIV) and Facilitating Conditions (FCV). The results for ages all constructs are statistically significant ($p\text{-value} < 0.5$) except Facilitating Conditions (FCV). The largest difference between young and older respondents is their

perception of Social Influence (SIV) with younger respondents ranking it the highest in importance. Older respondents considered Risk (RiskV) as the most important factor of adoption. Table 8 shows respondents divided by intention with Group 1 representing those strongly agreeing or agreeing that they would use mobile payments given the means to do so and Group 2 representing respondents strongly disagreeing or disagreeing that they would use mobile payments given they have the means to do so. All constructs are statistically significant except for Facilitating Conditions latent variable (FCV). Performance Expectancy (PEV) followed by Trust (TR2) and then Hedonic Motivation have the largest Z values indicating a large difference between those who intend to use and those with no intention to use.

	TR2	HM	HA	RiskV	SIV	FCV	BIU	PEV	EEV
Trust latent variable (TR2)	1.000								
Hedonic Motivation latent variable	.644**	1.000							
Habit latent variable (HA)	-.566**	-.785**	1.000						
Risk latent variable (RiskV)	-.373**	-.420**	-.440**	1.000					
Social Influence latent variable (SIV)	-.310**	-.315**	-.347**	-.074	1.000				
Facilitating Conditions (FCV)	-.322**	-.469**	-.334**	.058	.263**	1.000			
Behavioural Intention to use (BIU)	.625**	.803**	.959**	.438**	.352**	.331**	1.000		
Performance expectancy latent variable (PEV)	-.567**	-.674**	-.736**	.285**	-.377**	.300**	.803**	1.000	
Effort Expectancy latent variable (EEV)	-.476**	-.653**	-.538**	.401**	.184*	.488**	-.532**	-.409**	1.000

Table 4. Spearman rank order correlation (Correlation significant at ** P < 0.01, *P < 0.05)

Mann-Whitney U Test by variable gender: Group 1 = Male, Group 2 = Female									
	Group 1	Group 2	Rank Sum Group 1	Rank Sum Group 2	Mean Rank Group 1	Mean Rank Group 2	U	Z	p-value
TR2	54	60	3494.00	3061.00	64.70	51.02	1231.000	-2.375	.018
HM1	54	60	3357.50	3197.50	62.18	53.29	1367.500	-1.503	.133
H2	54	60	3461.50	3093.50	64.10	51.56	1263.500	-2.082	.037
RiskV	54	60	3414.50	3140.50	68.44	47.66	1029.500	-3.359	.001
SIV	54	60	3695.50	2859.50	68.44	47.66	1520.500	-.570	.569
FCV	54	60	3046.00	3509.00	56.41	58.48	1561.000	-.359	.720
BIU	54	60	3562.50	2992.50	65.97	49.88	1162.500	-2.629	.009
PEV	54	60	3269.50	3285.50	60.55	54.76	1455.500	-.941	.347
EEV	54	60	3340.50	3214.50	61.86	53.58	1384.500	-1.482	.138

Table 5. Effect of Gender on independent variables (Marked tests significant at p < 0.5)

Mann-Whitney U Test by variable experience: Group 1 = experienced, Group 2 = inexperienced									
	N Group 1	N Group 2	Rank Sum Group 1	Rank Sum Group 2	Mean Rank Group 1	Mean Rank Group 2	U	Z	p-value
TR2	78	36	5235.00	1320.00	67.12	36.67	654.000	-4.919	.000
HM1	78	36	5388.50	1166.50	69.08	32.40	500.500	-5.777	.000
H2	78	36	5350.00	1205.00	68.59	33.47	539.000	-5.426	.000
RiskV	78	36	5174.50	1380.50	66.34	38.35	714.500	-4.213	.000
SIV	78	36	4618.00	1937.00	59.21	53.81	1271.000	-.818	.413
FCV	78	36	4780.50	1774.50	61.29	49.29	1108.500	-1.931	.054
BIU	78	36	5310.00	1245.00	68.08	34.58	579.000	-5.093	.000
PEV	78	36	5169.50	1385.50	66.28	38.49	719.500	-4.206	.000
EEV	78	36	5294.00	1261.00	67.87	35.03	595.000	-5.469	.000

Table 6. Effect of Experience on independent variables (Marked tests significant at p < 0.5)

Mann-Whitney U Test by variable age Group 1 = Younger (< 31), Group 2 = Older (>=31)									
	Group 1	Group 2	Rank Sum Group 1	Rank Sum Group 2	Mean Rank Group 1	Mean Rank Group 2	U	Z	p-value
TR2	25	89	1582.50	4972.50	63.30	55.87	967.500	-1.068	.285
HM1	25	89	1542.50	5012.50	61.70	56.32	1007.500	-.754	.451
H2	25	89	1539.00	5016.00	61.56	56.36	1011.000	-.715	.474
RiskV	25	89	1301.00	5254.00	52.04	59.03	976.000	-.937	.349
SIV	25	89	1734.50	4820.50	69.38	54.16	815.500	-2.052	.040
FCV	25	89	1504.00	5051.00	60.16	56.75	1046.000	-.488	.625
BIU	25	89	1551.00	5004.00	62.04	56.22	999.000	-.787	.431
PEV	25	89	1633.50	4921.50	65.34	55.30	916.500	-1.353	.176
EEV	25	89	1621.00	4934.00	64.84	55.44	929.000	-1.394	.163

Table 7. Effect of Age on independent variables (Marked tests significant at p < 0.5)

Mann-Whitney U Test by variable Intention to Use Group 1 = Intention to use, Group 2 = No intention to use									
	Group 2	Group 1	Rank Sum Group 2	Rank Sum Group 1	Mean Rank Group 2	Mean Rank Group 1	U	Z	p-value
TR2	7	89	4572.50	83.50	51.38	11.93	55.500	-3.937	.000
HM1	7	89	4578.00	78.00	51.44	11.14	50.000	-3.927	.000
H2	7	89	4536.50	119.50	50.97	17.07	91.500	-3.433	.001
RiskV	7	89	4493.50	162.50	50.49	23.21	134.500	-2.500	.012
SIV	7	89	4536.00	120.00	50.97	17.14	92.000	-3.124	.002
FCV	7	89	4384.50	271.50	49.26	38.79	243.500	-1.035	.301
PEV	7	89	4605.00	51.00	51.74	7.29	23.000	-4.104	.000
EEV	7	89	4464.50	191.50	50.16	27.36	163.500	dd-2.346	.019

Table 8. Effects of Intention to Use or not use on independent variables (Marked tests significant at p < 0.5)

DISCUSSION

The Spearman’s rho rank correlation coefficient on intention to use mobile payments, show that all constructs have a statistically significant relationship. Trust was one of the most significant contributor to mobile payment adoption (H1). That is, respondent perception of trust affected their intention to adopt mobile payments, and this is increased with their perceived risk of using mobile payment systems. Our findings show a statistical significant relationship between perceived risk and intention to use mobile payments (H2). According to McKnight et al., (2002, 297), ‘building consumer trust is a strategic imperative for web-based vendors because trust strongly influences consumer intentions to transact with unfamiliar vendors via the web. Trusts helps consumers to overcome perceptions of risk and uncertainty, and to engage in the following three behaviour’s that are critical to the realization of a web-based vendor’s strategic objectives: following advice offered by the web vendor, sharing personal information with the vendor, and purchasing from the vendor’s web site. South African consumers’ reluctance to adopt mobile payments could be associated with the fact that some banks only complied with a few of the legislations proposed by the government’s Electronic Communications and Transactions (ECT)Act, which according to consumers, undermines the levels of trust which are in play between their themselves and banks (Kabanda et al 2010). It is therefore important for organization to take note and improve their systems because perceived risk negatively affects trust (Lee et al 2015) and an improved system quality positively impacts trust (Chemingui and Ben lallouna 2013). Given that “social and economic exclusion is the biggest challenge for South Africa” (Oyedemi 2012, 302), our findings recall and reemphasize those of Wentzel et al (2013,670) who alerts banks in South Africa to “instill trust in the unbanked bottom-of-the-pyramid customers”. Given that there are no existing partnerships among banks, telcos, and payments companies—other than small programs by telcos that mainly focus on SMS transfers (<https://mobilereadiness.mastercard.com>); South Africa needs to develop a strong partnership with key stakeholders to address the trust challenge facing consumers.

The moderators Gender, Experience and Age had noticeable effects on almost all constructs measured. Gender had the strongest influence on perceived risk with females being more concerned about risk associated with mobile payments than Males. Despite these findings, a recent report by effectivenessmeasure (2016) show that South African females aged between 18 to 39 were the more prominent visitor to shopping websites, making up 55.0% of all visitors. However, these findings are not generalizable to the whole population of South Africa because the sample addresses users who have access to the internet and who are mostly of middle to high income earners. According to UNICEF (2012), who gives a more generalizable sample, there is a fairly stark gender gap amongst South African individuals aged 15 to 60-years old, with approximately 31 % Internet users being female. In South Africa, this has been mainly attributed to the income disparities between men and women, with men earning almost three times as their counterparts (Gillwald & Deen-Swarray, 2013).

In this study, we find that social influence does affect user's intention to adopt and use mobile payments as moderated by age (H5). That is, younger respondents perceived social influences as an important aspect of their intention to use mobile payments. Similar findings are reported in literature (Thakur,2013; Yang et al 2012). Performance expectancy (H3), effort expectancy (H4), facilitating conditions (H6), and hedonic motivation (H7) were found to be partially significant towards intentions to adopt mobile payments and were moderated by the user's age and experience. The main difference between young and older respondents was that the young respondents gave effort expectancy and performance expectancy a much higher value than their older counterparts did. This is not surprising given that young, affluent, and single individuals tend to be the most positive toward mobile commerce adoption (Okazaki, 2006). Finally, the findings show that user's habit strongly affect their intention to use mobile payments (H9). These findings are also reported literature (Baptista & Oliveira 2015; Kim 2012) who argue that the role of habit in the context of mobile applications play critical roles in the mobile environment. That is, consumers who perceived mobile payments as any other form of payment were more likely to engage in mobile payments. Jai et al (2014,8) finds similar results that "consumers who have formed the habit to shop online and use mobile service and cell phone frequently are more likely to form the habit of using mobile payments". Mobile service providers and the various stakeholders have to embark on an awareness campaign to improve adoption and habitual use because shopping online is not a habitual practice in the South African context (<https://mobilereadiness.mastercard.com>).

In summary, the findings depict that middle income earners propensity to adopt mobile payment is influenced by their habits and social influence. Consumers however have concerns related to trust and risk associated with mobile payments, partly because South Africa has traditionally been a cash-oriented market and changing behavior can take time (mastercardadvisors). Despite these concerns, one of the largest banks in the country has shown that middle income earners are making fewer cash withdrawals at ATMs and instead opting to use point of sale devices, electronic transactions and cash tills from select retailers (PaymentsAfrica 2017). Although our study was not meant to contrast the middle income with the low income earners, the results show that South African middle income earners are engaging in mobile payments and are not only focusing their attention on mobile money which has been the characteristic of many African countries.

CONCLUSION

The purpose of this study was to identify the factors that influence middle class citizens in developing countries to adopt mobile payments. Using an online survey of middle income earners in South Africa, the study found that trust, habit and risk were significant factors towards adoption of mobile payment, with gender, experience and age as the moderating factors. However, gender had the strongest influence on risk, with women showing more apprehension about risks associated with mobile payments. Social influence, Performance expectancy, effort expectancy, facilitating conditions and hedonic motivation were found to be partially significant towards intentions to adopt mobile payments. Younger respondents perceived social influence to be important than older respondents towards their adoption of mobile payments; and so gender and experience were not moderating factors for social influence. Gender was not regarded as a moderating factor in how respondents perceive their hedonic motivation and contextual facilitating conditions, however, age and experience was. The findings provide the financial services industry and providers of mobile commerce offering with a better understanding of the concerns of South African middle income earners and calls for all stakeholders to address these concerns so as to enable penetration of mobile payment adoption. The paper can be improved if structural equation modelling was used to analyse the research model, instead of individual correlation analysis between constructs. In this manner, we can see the

importance of each construct and its contribution towards to the explanation of the dependent variable. This limitation will be examined in our future work.

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