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# Social Commerce and the Mobile Platform: Payment and Security Perceptions of Potential Users

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# Social Commerce and the Mobile Platform: Payment and Security Perceptions of Potential Users

Abstract: With an estimated 2.46 billion social media users globally, the commercial potential for social commerce is clear. Fundamental aspects of social commerce include making and receiving payments with users feeling secure when doing so, and ensuring the site is enjoyable and easy to use. As social commerce migrates to the mobile platform, perceptions of these elements within a mobile context have become of paramount importance. Correspondingly, this study extends existing knowledge by employing a context theory contextualization approach to develop two research models to investigate user perceptions of payments, security (in terms of risk and trust), and ease of use within a mobile context. Empirical data were analyzed using variance-based structural equation modeling, including multi-group analysis to explore possible differences based on gender, age, and method used to pay for mobile services. Results reveal that perceived innovativeness is a key success factor, followed by perceived usefulness, and convenience. Perception of a secure environment is only of partial influence. No differences were found based upon gender as a moderator, whereas age and method used to pay for mobile services both revealed differences in results. Theoretical and practical contributions are presented, along with acknowledged limitations and suggestions for further work.

Keywords: Social commerce; Mobile; Payments; Security; Innovativeness; Convenience

# **Social Commerce and the Mobile Platform:**

# **Payment and Security Perceptions of Potential Users**

# 1. Introduction

The term social commerce was first used in 2005 (Zhou, Zhang, & Zimmermann, 2013) to refer to a new style of online marketplace, where consumers could obtain guidance and recommendations from others, share experiences, locate goods and services, and, make purchases (Lu, Fan, & Zhou, 2016). In recent years, social commerce has emerged as a significant subset of the e-commerce domain (Zhang & Benyoucef, 2016) in which consumers involve the use of social media and user contributions to inform their purchasing activities (Hajli, 2015; Hajli & Sims, 2015). Social commerce is therefore a form of commerce resulting from the combination of commercial and social activities, being underpinned by Web 2.0 technologies in order to facilitate customer interactivity and content generation (Hajli, Sims, Zadeh, & Richard, 2017), and in being mediated by social media (Wang & Zhang, 2012), reintroduces to an extent, some of the social aspects of shopping (Lu et al., 2016). With an estimated 2.46 billion social media users globally, and more than 71% of Internet users having some form of social media account (Statista, 2018b), coupled with the fact that consumers often rely on the advice and recommendations of online friends when making purchase decisions (Chen & Shen, 2015), the commercial potential for social commerce is clear.

A number of studies have attempted to identify the fundamental set of business activities that social commerce sites should support. According to Zhou et al. (2013), these include transaction-based services such as purchases and payments, alongside pre-transaction and post-transaction services such as marketing and customer support. Huang & Benyoucef (2015) identify a number of features that should be incorporated into social commerce sites, including product information and customer reviews, and the ability to receive payments in order to process purchases. Indeed, purchasing and (by implication) processing of payments is viewed as a key element within the theoretical framework for consumer behavior in social commerce proposed by Zhang & Benyoucef (2016). Payments therefore are routinely viewed as one of the minimum requirements for social commerce sites (Huang & Benyoucef, 2015), and firms should ensure that consumers feel secure when making payments, taking into account, consideration of important associated issues such as trust and risk (Kim & Park, 2013). In addition to the provision of such functional requirements and assurances, there is also a necessity to ensure that social commerce sites are enjoyable and easy to use (Huang & Benyoucef, 2013).

Correspondingly, many social commerce websites are making significant technological investments in order to convert visitors to purchasers (Hajli, Wang, Tajvidi, & Hajli, 2017), while traditional e-commerce sites have added social aspects and content to introduce a communal element, allowing users to connect where they usually only make purchases (Lu et al., 2016). However, given the inherent complexities of the ecosystem involved, social commerce success will clearly not be achieved simply by providing additional functionality such as further on-screen options (Hajli et al., 2017), by adding a social layer to existing e-commerce web sites, or by integrating a retail aspect into social media sites (Zhou et al., 2013). It requires careful and successful integration of social networking innovations and fundamental characteristics on the one hand, with those of established e-commerce functionality and contextual aspects on the other.

Despite the palpable opportunities provided by social commerce, many organizations have ongoing concerns over the ability of social commerce to provide an appropriate return on investment (Zhou et al., 2013), with

capacity to generate revenue growth via substantial sales remaining a challenge (Hajli et al., 2017). Major social media providers have been seen to experience varying levels of success in the social commerce arena, with Twitter removing support from its "buy" button and disbanding the development team (Mayville, 2017), and Pinterest on the other hand, expanding activity to feature more than 60 million "buyable pins" (Zilles, 2017).

Hence, despite social media use reaching global levels, knowledge relating to the way in which consumers' engagement with the social media aspects of organizations progresses to engagement with the social commerce aspects (including making purchases) remains relatively scarce (Bianchi, Andrews, Wiese, & Fazal-E-Hasan, 2017), with relatively little attention given to date regarding attaining greater understanding of why consumers make purchases on social commerce sites (Bianchi et al., 2017; Lu et al., 2016). Indeed, according to Hajli et al. (2017), a priority in social commerce research is to examine consumer adoption behavior from a social commerce perspective in order to develop greater awareness and comprehension of the determining factors underpinning purchasing behavior.

The situation is further complicated, as alongside the appearance of social commerce as a phenomenon, the mobile platform has emerged as a key tool with which to engage consumers (Gao, Rohm, Sultan, & Pagani, 2013), with mobile services (m-services) now viewed as a common feature of everyday life (Schierz, Schilke, & Wirtz, 2010). Correspondingly, social networking activity has also become increasingly mobile, with mobile social media penetration rates reaching 58% in North America, 57% in East Asia, 47% in Western Europe, 45% in Oceania, and 42% in South East Asia (Statista, 2018a). Given this ongoing transfer of social media and (by consequence) social commerce to the mobile platform (Hagan, 2015; Lella & Lipsman, 2014), coupled with the central position occupied in the social commerce ecosystem by the ability to make and receive payments in a secure, enjoyable, and easy to use environment (Gonçalves Curty & Zhang, 2013; Huang & Benyoucef, 2013; Zhou et al., 2013), much of the potential for widespread use of social commerce would appear to be predicated upon the successful acceptance and adoption of mobile payments (m-payments) by social media users. However, despite the pivotal role of m-payments in the increasingly mobile social commerce context, little existing research explicitly links the two concepts.

Moreover, despite the apparent convenience and attraction of mobile payments (Gao & Waechter, 2015), actual take-up has been lower than anticipated, leading to the question of why consumers have not adopted m-payments to expected levels. For instance, while 52% of North Americans are "extremely aware" of m-payments only 18% use them on a regular basis (Silbert, 2015), often citing reasons including lack of personal value and trust (Shen, 2016). Correspondingly, given the migration of social media activity to the mobile platform, the level of m-payment acceptance potentially presents a key obstacle to the widespread success of social commerce.

Against this backdrop, and alongside calls by authors including Baethge, Klier, & Klier (2016), Zhou et al (2013) and Liang & Turban (2011) among others for further investigation into the "people" theme, and user adoption of social commerce, the aim of this paper is to make both theoretical and managerial contributions in terms of providing greater understanding of the human factors influencing consumer adoption of m-payments among social media users, hence contributing to a greater understanding of the journey from social media user to social commerce user. Specifically, the following research questions are investigated; (1) is the intention to use m-payments influenced by traditional technology adoption factors such as usefulness and ease of use?; (2) does the perception of a secure environment, as suggested by Kim & Park (2013), influence the intention to use

m-payments?; (3) do the human themes of perceived convenience and personal innovativeness mitigate the need for a secure environment, and/or influence the intention to use m-payments?

The remainder of the paper is organised as follows. Section 2 provides an overview of the theoretical background, while Section 3 presents the development of the proposed model, and hypotheses tested. Section 4 provides an account of the methods employed, and Sections 5 and 6 present and discuss the results. Finally, closing observations comprising theoretical and practical implications, study limitations, and recommendations for additional work are presented in Section 7.

# 2. Theoretical Framework

Among the various behavioral theories and models employed in studies investigating consumer adoption of new technologies, the Technology Adoption Model (TAM) has evolved into one of the most commonly used (Kim & Garrison, 2009). It has emerged over time as an established, robust, and parsimonious model, having accumulated substantial empirical support (Venkatesh & Davis, 2000), with studies employing TAM investigating of a variety of technologies in wide-ranging contexts.

TAM has been employed in numerous studies of consumer intentions toward a range of mobile technologies, including m-banking (Gu, Lee, & Suh, 2009; Luarn & Lin, 2005), m-commerce (Chong, Chan, & Ooi, 2012; Wu & Wang, 2005), m-payments (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014; Schierz et al., 2010), and m-shopping (Aldás-Manzano, Ruiz-Mafé, & Sanz-Blas, 2009; Ko, Kim, & Lee, 2009), among others.

As previously highlighted in reviews of the m-payment literature, although consumer-focused studies of adoption of m-payments have employed a range of well-established theories, most employ TAM as the theoretical base (Dahlberg, Guo, & Ondrus, 2015; Kim, Mirusmonov, & Lee, 2010; Zhou, 2013), with additional constructs (such as security, cost, trust, mobility, convenience, speed, facilitating conditions, attractiveness of alternatives, privacy, and anxiety among others) being incorporated specifically for the study of m-payments (Kim et al., 2010).

TAM has also been used as a fundamental theory to investigate user behavior in a range of social commerce studies, including those of Hajli et al. (2017) and Featherman & Hajli (2016), to the extent that it has been described as one of the core theories of social commerce research (Zhang & Benyoucef, 2016). Notwithstanding the amount of existing research relating to TAM, additional studies with varying user populations examining contemporary technologies are still clearly required (Kim et al., 2010). Consequently, having been developed and refined to fit the individual technology adoption context, and replicated and applied in many settings (including numerous within the mobile context), and in being viewed as a core theory of social commerce research, TAM is viewed as providing an appropriate theoretical perspective for use in this study.

# 3. Hypotheses Development

TAM suggests that behavioral intention (BI) toward a technology at the individual level is predicated upon two key variables; perceived ease of use (PEOU), and perceived usefulness (PU), and these, in turn, predict attitudes towards that technology, along with subsequent use. Previous studies have provided extensive empirical evidence supporting the relationships between TAM constructs (Choi & Totten, 2012). Studies focusing specifically on mobile technologies have also confirmed these relationships; see for instance, PU and BI (Aldás-Manzano et al., 2009; Chandra, Srivastava, & Theng, 2010; Chong et al., 2012; Gu et al., 2009; Ko et

al., 2009; Liébana-Cabanillas et al., 2014; Luarn & Lin, 2005; Wu & Wang, 2005), PEOU and BI (Aldás-Manzano et al., 2009; Gu et al., 2009; Ko et al., 2009; Luarn & Lin, 2005; Wu & Wang, 2005), and PEOU and PU (Chandra et al., 2010; Gu et al., 2009; Liébana-Cabanillas et al., 2014; Luarn & Lin, 2005; Schierz et al., 2010; Wu & Wang, 2005).

Consequently, TAM predicts that an individual's BI toward m-payments depends on his or her perceptions of PU and PEOU of m-payments. Furthermore, PEOU will have a positive influence on the PU of m-payments. Hence, the following are hypothesised:

- **H1.** Perceived usefulness positively influences user intention to use m-payments.
- **H2.** Perceived ease of use positively influences user intention to use m-payments.
- H3. Perceived ease of use positively influences perceived usefulness of m-payments.

The concept of trust is closely linked to perceptions of security, and has been extensively explored across a range of disciplines, being seen to have a significant impact on consumer behavior (Colquitt, Scott, & LePine, 2007). Given the many definitions and conceptualizations of trust (Alsajjan & Dennis, 2010; Colquitt et al., 2007), this study adopts the perspective of the highly cited works of Mayer, Davis, & Schoorman (1995) and Rousseau, Sitkin, Burt, & Camerer (1998) who similarly refer to trust as a willingness to be vulnerable to actions based on an expectation that the other party will engage in acceptable practices, and, as a psychological state comprising the intention to accept vulnerability based on positive expectations. Both definitions comprise two primary components; intention to accept vulnerability, and positive expectations (Colquitt et al., 2007). Unsurprisingly, trust is viewed as being highly important in the context of BI toward new technologies (Alsajjan & Dennis, 2010). The concept is therefore likely to be significant in the context of mobile technologies, in which there is a clear relinquishing of control (accepting vulnerability) based on the belief that the anticipated product/service will be provided (positive expectation). This relationship between trust and BI toward mobile technology has been previously examined and established in studies by Chandra et al. (2010) and by Gu et al. (2009). The issue of trust is also linked to a number of social commerce factors (Zhang, Lu, Gupta, & Zhao, 2014), including product and seller uncertainty (Bai, Yao, & Dou, 2015), and is a matter of ongoing importance (Lin, Li, & Wang, 2017), hence:

**H4**. Trust has a positive influence on user intention to adopt m-payments.

Moreover, trust has long been associated with perceived risk (Vincent-Wayne, 1999) the concepts being modelled together in numerous studies of on-line activity, with both being found to influence consumer attitudes (Glover & Benbasat, 2011). Trust is generally modelled as influencing perceived risk on the basis that greater levels of trust are expected to lower levels of perceived risk (see Glover & Benbasat (2011), Luo, Li, Zhang, & Shim, 2010), and van der Heijden, Verhagen, & Creemers (2003) among others). Thus, consumers' perceived risk regarding use of m-payments would be expected to decrease as trust in m-payments increases, hence:

**H5**. Trust has a negative influence on the perceived risk of using m-payments.

Perceived risk is viewed as unanticipated and undesirable consequences that may result from a product purchase, and has long been the focus of research in order to better understand consumer behavior (Forsythe & Shi, 2003). In keeping with previous work investigating consumer BI toward new technology, for instance, that of Featherman & Pavlou (2003), Luo et al. (2010) and van der Heijden et al. (2003), consumer BI toward using

m-payments would be expected to decrease as risk perceptions increase. This relationship between perceived risk and BI has been previously confirmed in the mobile technologies context by Liébana-Cabanillas et al. (2014) and by Wu & Wang (2005). Risk has been identified as a key aspect of social commerce research by authors including Baethge et al. (2016), Featherman & Hajli (2016), and Hew, Lee, Ooi, & Lin (2016), hence it is hypothesised:

**H6**. Perceived risk has a negative influence on user intention to adopt m-payments.

Convenience is viewed as being fundamental to the marketing of goods and services (Berry, Seiders, & Grewal, 2002), and consequently has received much attention in the marketing and consumer behavior literature (Kim et al., 2010). Given that m-payment is a service rather than a product, this study adopts the service-oriented interpretation of the much-cited work of Berry et al. (2002), in viewing convenience as consumers' time and effort perceptions related to buying or using a service. According to de Kerviler, Demoulin, & Zidda (2016), convenience provides a form of utilitarian value, with Kim et al. (2010) contending that convenience is a combination of time and space utilities, both of which are principal characteristics of the mobile platform. It is unsurprising then, that convenience has previously been found to be one of the most influential motivating factors in the m-commerce domain (Xu & Gutiérrez, 2007), and has also been investigated within the m-payment context – see for instance, the works of Dahlberg et al. (2015), Kim et al. (2010), and Thakur & Srivastava, (2014). Thus, an individual's BI toward using m-payments would be expected to increase in line with greater levels of perceived convenience of m-payments, and hence:

#### H7. Perceived convenience has a positive influence on user intention to adopt m-payments.

According to Hirschman (1980), few concepts have greater bearing on consumer behavior as innovativeness – an individual's tendency to seek out new and different ideas, goods, and services. Consequently, the concept of innovativeness has received significant attention from researchers examining consumer-related issues, with, according to Citrin, Sprott, Silverman, & Stem (2000), two main forms emerging in the literature; open processing innovativeness (relating to general openness to new experiences as a personality characteristic), and domain specific innovativeness (in which consumer innovation may be more domain or product/service specific). Technology acceptance and adoption researchers generally implicitly employ variations of domain specific innovativeness – including those examining perceptions of technology and technology-related services in the mobile context – see for instance the works of Aroean & Michaelidou (2014), Kim et al. (2010), Oliveira, Thomas, Baptista, & Campos, (2016), Thakur & Srivastava (2014), and Yang, Lu, Gupta, Cao, & Zhang (2012) among others. Accordingly, this study is aligned with the domain specific innovativeness approach employed in these works, and suggests that an individual's BI toward using m-payments would be expected to increase in line with greater levels innovativeness, hence:

#### **H8**. Perceived innovativeness has a positive influence on user intention to adopt m-payments.

The resulting research model is shown in Fig. 1. According to Baethge et al. (2016), despite a general focus on user behavior in various contexts in social commerce research, there remains a clear need for further studies that investigate the interplay *between* research model variables which are seen to influence user participation behavior. Such exploration of the interactions between variables is closely aligned with the context theory contextualization approach of Hong, Chan, Thong, Chasalow, & Dhillon (2014) which

recommends refinement of a given research model at a finer level by manipulating and investigating the interrelationships between factors in order to explore the possibility of hidden relationships which are not evident from an initial research model. In this case, adoption of the approach of Hong et al. (2014) and associated manipulation of the research model results in a second model (Fig.2), in which the contextual variables of Fig.1 (innovativeness and convenience) are also viewed as potential moderators of the relationships between the antecedents of behavioral intention and behavioral intention itself (presented as M1-M8 in Fig 2).

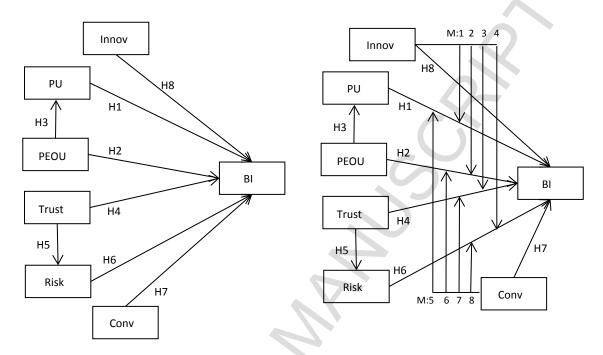


Fig. 1. Model 1

Fig. 2. Model 2: Contextual Variables as Moderators

Notes: Significance: BI=Intention to Use; Moderating effects of Contextual Variables in Model 2 numbered M1-M8.

# 4. Research Methodology

#### 4.1 Procedure and Subjects

The majority of studies investigating consumer acceptance of technologies have focused on industrialised countries (Alsajjan & Dennis, 2010). Hence, while additional research in general is needed on social commerce as a phenomenon, regional and national variations in consumer behavior continue to support the views of Alsajjan & Dennis (2010) and Davis, Wang, & Lindridge (2008) among others, in that research is required in diverse cultural settings. Locating research in non-industrialised countries affords the opportunity to compare results with those which emerge from industrialised countries, providing organizations with insights into how they may fine-tune the promotion of the mobile social commerce and m-payment services where appropriate. Consequently, data for this study were collected in a country in the Middle East, which in being part of the Middle East and Africa block, is an area exhibiting the strongest mobile data traffic growth (Cisco, 2017), and hence is one with much potential for mobile social commerce. Participants were regular users of social media, with the majority using mobile devices to access various m-services, but not for m-payments, and hence were *potential* users of mobile social commerce rather than existing users.

A survey was conducted, questionnaire development following the multi-stage approach presented by Morgan-Thomas & Veloutsou (2013). Initial questions were derived from a literature review, the resulting preliminary questionnaire being pre-tested by an expert panel comprising doctoral candidates and faculty members. A small number of revisions regarding structure and wording were made at this point. A pre-test with a convenience sample of eight consumers (nationals of the country in which the study was located) was then carried out in order to confirm clarity and ensure unambiguous communication with respondents. Following consideration of feedback obtained during this process, further minor changes were made to the wording of some questions. The questionnaire was developed in English, being widely spoken throughout the country concerned. The questionnaire was initially distributed by hand to a cross section of the professional community, with a request that the original participants provide details of contacts in different firms, thus increasing the reach of the study. This snowball-sampling approach is often used where the aim of a study (such as this) is primarily exploratory, and where the target population may be difficult to enumerate (Faugier & Sargeant, 1997). This process resulted in questionnaires being distributed to 310 individuals via the initial and secondary contact phases, being reduced to 300 after the removal of duplicate secondary contacts, with 265 participants responding during the time frame. Of the questionnaires returned, 28 were incomplete, leaving 237 usable responses.

#### 4.2 Measurement Items

Items used to measure the original TAM constructs, and the added constructs of trust, risk, personal innovativeness, and perceived convenience were drawn from previously validated scales in the extant literature relating to m-banking/m-payments where possible, being reworded where appropriate to fit the context of this study. Measurement items and sources are reported in the Appendix. All items were based on a seven-point Likert scale, with the future tense being used based on the understanding that respondents were potential, and not existing, users. Items used to measure BI were adopted from the m-payment studies of Kim et al. (2010) and Schierz et al. (2010). The measure of convenience was captured using items based on the work of Kim et al. (2010), while personal innovativeness was captured using items adapted from Yang et al. (2012). Items used to measure PU and PEOU were adapted from the study of Schierz et al. (2010), with risk being captured using items adopted from Liébana-Cabanillas et al. (2014). The measure of trust was captured using items adopted from the work of Zhou (2013).

#### 5. Results

Data analysis was conducted by variance-based structural equation modeling (SEM), specifically PLS, which has become an increasingly prominent methodological approach (Sarstedt, Ringle, Henseler, & Hair, 2014). PLS is appropriate for testing path models (Hajli, Shanmugam, Powell, & Love, 2015), and facilitates identification of success drivers (in this case, of BI toward m-payments).

#### 5.1 Measurement Model Assessment

All constructs in both research models are first-order reflective, measurement quality being verified by examining convergent validity, discriminant validity and internal consistency. The influence of common methods bias was also scrutinised. Summary results for measurement model quality for model 1 are provided in Table 1. Convergent validity was assessed as follows; first, item reliability was inspected for each item.

Convergent validity requires indicator loadings to be 0.6 or more (Bagozzi & Yi, 1988). All indicators had loadings well above 0.6, apart from two; one measuring innovativeness, and one measuring intention to use, and both were removed from the model. Remaining item loadings (Table 1) demonstrated acceptable convergent validity and were retained for subsequent analysis. Second, average variance extracted (AVE) was examined for each construct. Table 1 shows that AVE values were substantially higher than Chin's (1998) suggested 0.5 threshold, indicating satisfactory reliability and convergent validity.

Table 1: Summary Results for Measurement Model Quality

Latent Variable	Indicators	Loading s	Composite Reliability	Cronbach's α	AVE
Intention to Use			0.9483	0.9183	0.8594
	Intent1	0.9285			
	Intent2	0.9326			
	Intent3	0.9200			
Convenience			0.9047	0.8424	0.7605
	Conv1	0.9020			
	Conv2	0.9082			
	Conv3	0.8019			
Personal Innovativeness			0.8936	0.8184	0.7390
	Innov1	0.9205			
	Innov2	0.9191			
	Innov3	0.7245			
Perceived Ease of Use			0.9490	0.9195	0.8613
	PEOU1	0.8974			
	PEOU2	0.9375			
	PEOU3	0.9485			
Perceived Usefulness			0.9462	0.9242	0.8147
	PU1	0.9151			
	PU2	0.9205			
	PU3	0.8808			
	PU4	0.8935			
Risk			0.9306	0.8882	0.8174
	Risk1	0.8733			
	Risk2	0.9253			
	Risk3	0.9128			
Trust			0.9164	0.8629	0.7852
	Trust1	0.9175			
	Trust2	0.8621			
	Trust3	0.8779			

Discriminant validity was assessed as follows. First, all items loaded more heavily onto their corresponding constructs than onto other constructs (Table 2), thus satisfying Chin's (1998) discriminant validity requirement Second, the square root of AVE for each construct was higher than the inter-scale correlation (Table 3), hence satisfying conditions of the widely used Fornell and Larcker (1981) test. Finally, heterotrait-monotrait (HTMT) ratio of correlations ranged between 0.39 and 0.797, and in being below the limit of 0.90 proposed by Henseler, Ringle, & Sarstedt (2015), further indicated that discriminant validity had been established.

Composite reliability (CR) measures were all higher than the 0.7 threshold (Table 1) of Chin (2010). Internal consistency was further assessed via Cronbach's  $\alpha$  values, all of which were above 0.8 (Table 1), indicating either excellent (>=0.90) or high (0.70-0.89) reliability (Hair, Celsi, Money, Samouel, & Page, 2014).

Table 2: Loadings and Cross Loadings

	BI	Conv	Innovate	PEOU	PU	Risk	Trust
T1						-	
Intent1	0.9285	0.5821	0.6975	0.3840	0.5592	-0.4858	0.3672
Intent2	0.9326	0.5483	0.6092	0.3881	0.5604	-0.3921	0.3250
Intent3	0.9200	0.5629	0.6105	0.3723	0.5602	-0.4234	0.3337
Conv1	0.5767	0.9020	0.6503	0.3648	0.4839	-0.3729	0.3153
Conv2	0.5656	0.9082	0.6199	0.2722	0.4740	-0.3658	0.3551
Conv3	0.4376	0.8019	0.4640	0.2688	0.3798	-0.4151	0.5215
Innov1	0.6310	0.5947	0.9205	0.3836	0.5231	-0.4066	0.3217
Innov2	0.6509	0.6348	0.9191	0.3539	0.5529	-0.4037	0.3339
Innov3	0.4865	0.4906	0.7245	0.3212	0.4062	-0.3835	0.4115
PEOU1	0.3061	0.2667	0.3482	0.8974	0.4609	-0.2914	0.3710
PEOU2	0.4270	0.3633	0.4064	0.9375	0.4990	-0.4217	0.4217
PEOU3	0.4026	0.3316	0.3848	0.9485	0.5057	-0.4142	0.3894
PU1	0.5447	0.4857	0.5259	0.4587	0.9151	-0.4263	0.3409
PU2	0.5483	0.4682	0.5104	0.4622	0.9205	-0.4172	0.3429
PU3	0.5700	0.4902	0.5672	0.5324	0.8808	-0.4136	0.3296
PU4	0.5124	0.4096	0.4816	0.4422	0.8935	-0.3984	0.3251
Risk1	-0.4112	-0.3715	-0.3714	-0.3479	-0.3948	0.8733	-0.4691
Risk2	-0.4034	-0.3933	-0.4327	-0.3790	-0.4047	0.9253	-0.5470
Risk3	-0.4568	-0.4151	-0.4416	-0.3814	-0.4429	0.9128	-0.5666
Trust1	0.2993	0.4460	0.3736	0.3676	0.3254	-0.5508	0.9175
Trust2	0.3892	0.3260	0.3660	0.4433	0.4040	-0.4950	0.8621
Trust3	0.2917	0.4013	0.3358	0.3160	0.2519	-0.5109	0.8779

Notes: BI=Intention to Use, Conv=Convenience, Innovate=Personal Innovativeness.

Common-method bias (CMB) is variance associated with the measurement method rather than the constructs the measures are intended to represent (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), and can be a major source of measurement error in survey-based research (Bagozzi & Yi, 1988). Both ex-ante and ex-post procedures (Chang, van Witteloostuijn, & Eden, 2010) were conducted to consider CMB. With regard to ex-ante activities, respondents were informed in the questionnaire that there were no correct or incorrect responses, and that participation was on an anonymous basis (Sichtmann & Diamantopoulos, 2013). In terms of ex-post activities, Harman's single-factor test (Podsakoff et al., 2003) was used. Harman's test yielded five factors with eigenvalues above one, with all five factors accounting in total for 76.5% of total variance. The first factor accounted for 42.8% of variance, which in being less than the 50% threshold proposed by Wong, Tan, Tan, & Ooi (2015), suggested that CMB was not a problem in the data. Given that satisfying Harman's single-factor test does not fully remove the likelihood of CMB (Podsakoff et al., 2003), the test employed by Pavlou, Huigang, & Yajiong (2007) was also performed, in which the construct correlation matrix is inspected to determine if any constructs correlate particularly highly (> 0.90). Table 3 demonstrates that no such correlations were present, confirming that CMB was not of major concern.

Table 3: Construct Correlation Matrix

	BI	Conv	Innovate	PEOU	PU	Risk	Trust
BI	0.9270						
Conv	0.6094	0.8721					
Innovate	0.6912	0.6706	0.8596				
PEOU	0.4115	0.3481	0.4105	0.9281			
PU	0.604	0.5152	0.5796	0.5272	0.9026		
Risk	-0.4696	-0.4359	-0.4609	-0.4092	-0.4590	0.9041	
Trust	0.3697	0.4412	0.4052	0.4254	0.3710	-0.5859	0.8861

Notes: Square root of AVE on the diagonal, other elements show construct inter-correlations. BI=Intention to Use.

Model 2 introduces a number of additional constructs in the form of moderator terms. Given that this form of model variation is likely to introduce marginal changes to measurement properties (Hair Jr, Hult, Ringle, & Sarstedt, 2016), model 2 was also assessed for convergent and discriminant validity and the influence of CMB. As anticipated, changes related to measurement model quality as a result of the modification were minimal. Consequently, results suggest that the measurement models for both model 1 and model 2 demonstrated satisfactory convergent and discriminant validity, internal consistency, and absence of CMB required for hypotheses testing.

#### 5.2 Structural Model Assessment

Assessment of the structural model in (variance-based) PLS differs from the approach of covariance-based SEM, in which a series of goodness of fit measures are employed to assess the discrepancy between the theoretical and empirical covariance matrices. In contrast, PLS employs a series of key criteria (including significance of path coefficients,  $R^2$  values,  $f^2$  effect sizes, and Stone-Geisser's  $Q^2$  predictive relevance value) to assess how well it predicts the endogenous constructs (Rigdon, 2012).

Results of hypothesis testing for both models are summarised in Fig. 3 and Fig 4, and in Table 4. In Fig. 3, R<sup>2</sup> values (indicating the predictive power of the models) are provided for each endogenous variable. Fig. 3 illustrates that model 1 explains 27.8% of the variance in PU, 34.3% of the variance in risk, and 57.1% of variance in BI toward m-payments, with model 2 (Fig. 4) explaining 27.8% of the variance in PU, 34.3% of the variance in risk, and 58.9% of the variance in BI toward m-payments.

According to Cohen's (1988) guidelines,  $f^2$  values of 0.02, 0.15, and 0.35 represent small, medium and large effect sizes respectively. In model 1, the  $f^2$  effect size on the BI endogenous variable was highest for personal innovativeness (0.152), and lowest for trust (0.002), indicating medium and small effects respectively. The  $f^2$  effect sizes for PEOU on PU (0.385) and trust on risk (0.523) both indicated large effect sizes. Model 2  $f^2$  effect sizes on BI were also highest for personal innovativeness (0.114), and lowest for trust (0.001), indicating medium and small effects respectively. The  $f^2$  effect sizes for PEOU on PU (0.385) and trust on risk (0.523) again both indicated large effect sizes.

Calculation of the Stone-Geisser criterion returned Q<sup>2</sup> values of 0.208 (PU), 0.264 (risk), and 0.454 (BI) for both models, underlining the predictive relevance of both model 1 and model 2. Power analysis for both models returned a value substantially above the 0.8 threshold of Cohen (1988), further underpinning confidence in the

findings. Bootstrapping in both cases was performed to provide a significance level for each hypothesised relationship – parameter settings for bootstrapping included no sign changes, and 5,000 samples.

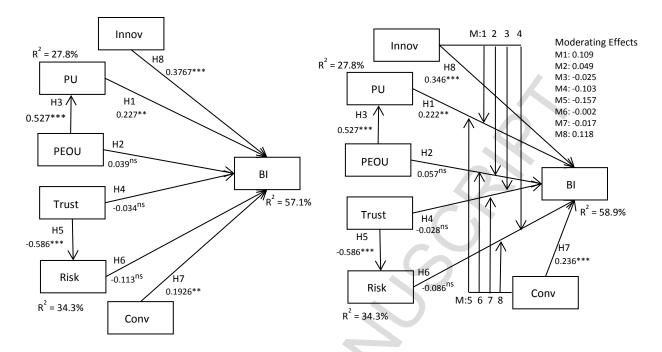


Fig. 3. Model 1

Fig. 4. Model 2: Contextual Variable as Moderators

Notes: Significance: \*p<0.05; \*\*p<0.01; \*\*\*p<0.001, ns-not significant; BI=Intention to Use; Moderating effects of Contextual Variables numbered M1-M8.

Bootstrapping results confirmed that the moderating effects in model 2 were minor and non-significant, innovativeness having a minimal positive influence on the relationships between PU and BI and between PEOU and BI, and a minimal negative impact on the relationships between risk and BI and between trust and BI. Convenience was revealed to have minor negative influences on the relationships between PU and BI, between PEOU and BI, and between risk and BI, along with a minor positive influence on the relationships and between trust and BI. Results of a slope analysis performed for both moderating variables are shown in Fig. 5 and Fig. 6.

In terms of the moderating effects of innovativeness on the relationships between BI toward m-payments and its antecedents (Fig. 5), slope analysis revealed that level of innovativeness appeared to have little influence on the association between risk and BI. However, a higher level of innovativeness was found to strengthen the relationship between PEOU and BI, while a lower level of innovativeness was found to lead to a weaker relationship between PEOU and BI. A higher level of innovativeness was also found to strengthen the relationship between PU and BI, while a lower level of innovativeness was found to weaken the relationship. In terms of the relationship between trust and BI, both higher and lower levels of innovativeness were found to strengthen the relationship in comparison to the non-moderated connection, albeit in opposing forms (higher levels of innovativeness leading to a stronger negative relationship, and lower levels leading to a stronger positive relationship), hence further work on this aspect would clearly be of use.

Table 4: Summary of Results

		Model 1	Model 2
	$R^2$		
	PU	27.8	27.8
	Risk	34.3	34.3
	BI	57.1	58.9
	Relationship		
H1	PU → BI	0.227 (2.87)**	0.222 (2.92)**
H2	PEOU → BI	0.039 (0.69)	0.057 (0.93)
H3	PEOU → PU	0.527 (9.38)***	0.527 (9.31)***
H4	Trust → BI	-0.034 (0.69)	-0.028 (0.57)
H5	Trust → Risk	-0.586 (11.99)***	-0.586 (12.08)***
H6	Risk → BI	-0.113 (1.78)	-0.086 (1.42)
H7	Convenience → BI	0.1926 (2.83)**	0.236 (3.35)***
H8	Innovativeness → BI	0.3767 (4.50)***	0.346 (4.02)***
	Moderating Effects		
M1	Innovativeness * PU → BI		0.109 (0.92)
M2	Innovativeness * PEOU → BI		0.049 (0.50)
M3	Innovativeness * Trust → BI		-0.025 (0.25)
M4	Innovativeness * Risk → BI		-0.103 (1.05)
M5	Convenience * PU → BI		-0.157 (1.45)
M6	Convenience * PEOU → BI		-0.002 (0.02)
M7	Convenience * Trust → BI		-0.017 (0.19)
M8	Convenience * Risk → BI		0.118 (1.25)

Notes: t-values in parentheses, \*p<0.05; \*\*p<0.01; \*\*\*p<0.001, BI=Intention to Use.

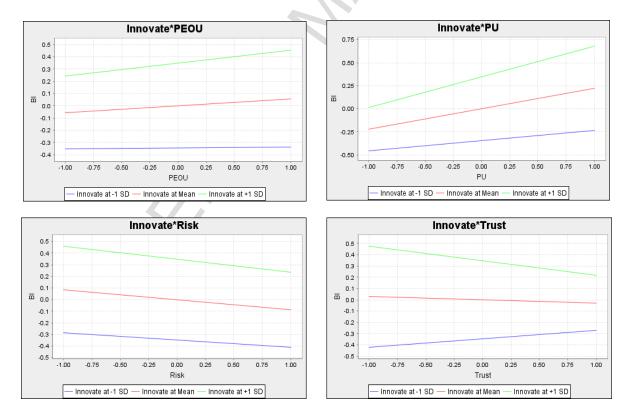


Fig. 5. Relationships between antecendents and BI moderated by innovativeness.

In terms of the moderating effects of convenience on the relationships between BI toward m-payments and its antecedents (Fig. 6), slope analysis revealed that level of convenience appeared to have little influence on the relationship between PEOU and BI, or on the relationship between risk and BI. However, a higher level of convenience was found to weaken the relationship between PU and BI, while a lower level of convenience leads to a stronger relationship between PU and BI. Both higher and lower levels of convenience were found to strengthen the relationship between trust and BI in comparison to the non-moderated connection, again in opposing forms (higher levels of perceived convenience leading to a stronger positive relationship, and lower levels leading to a stronger negative relationship), hence once more, further investigation would be of use.

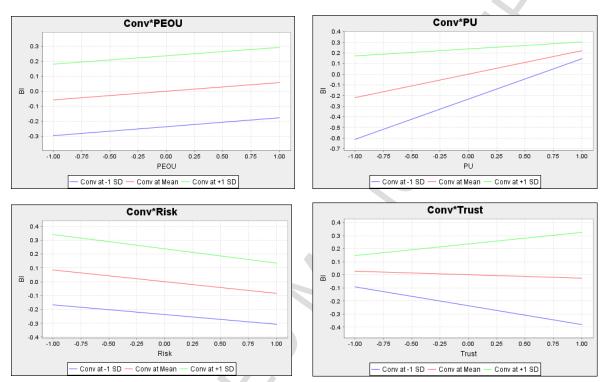


Fig. 6. Relationships between antecendents and BI moderated by convenience.

#### 5.3 Multi-Group Analysis

Prior to investigation of the impact of gender, age, and the method used to pay for m-services on results, the MICOM procedure (Jörg Henseler, Ringle, & Sarstedt, 2016) was employed in order to establish measurement invariance for both models across each of these three groups.

Subsequent model 1 multi-group analysis based on gender as a moderator did not reveal any significant differences between R<sup>2</sup> values obtained for male and female participants. Similarly, there was no evidence of significant variation of path coefficients between genders.

Age within the sample was divided broadly into two categories; Generation X (age between 36-56) and Generation Y (age between 18-35). As was the case with gender, model 1 multi-group analysis based on age as a moderator did not reveal any significant differences between  $R^2$  values obtained. However, there was evidence approaching significance at the 10% level of a difference between path coefficients in terms of the impact of convenience on BI (Generation X = 0.226, Generation Y = -0.117). Further work in this respect would therefore be of use.

The final model 1 multi-group analysis focused on the method used by participants to pay for m-services, being divided between those who were contract-based and those using non-contractual (pre-paid) arrangements. Model 1 multi-group analysis on this basis did not reveal any significant differences between the R<sup>2</sup> values obtained. However, path coefficients varied significantly at the 10% level in terms of the impact of Trust on BI (Contract =-0.033, Non-Contract =-0.379) being significant at the 1% level and non-significant respectively.

Model 2 multi-group analysis based on gender as a moderator did not reveal any significant differences between R<sup>2</sup> values obtained for male and female participants. Similarly, there was no evidence of significant variation of path coefficients between genders, nor of variation in the moderating effects of innovativeness or convenience.

Model 2 multi-group analysis based on age as a moderator did not reveal any significant differences between  $R^2$  values obtained. However, path coefficients varied significantly according to age in one aspect; the impact of convenience on BI (Generation X = 0.272, Generation Y = -0.364), being significant at the 0.1% level and non-significant respectively with the difference being observed at the 5% level. The moderating effect of innovativeness on path coefficients also varied significantly with regard to its impact on the link between PU and BI, and on the association between risk and BI. The moderating effect of innovativeness on the association between PU and BI (M1 in Fig. 6) varied in terms of Generation X (0.167, significant at the 10% level) and Generation Y (-0.774, non-significant), the difference in effects being observed at the 5% level. The moderating effect of innovativeness also varied significantly at the 10% level in terms of the relationship between risk and BI (M4 in Fig. 6), being non-significant for Generation X (-0.040) and significant at the 10% level for Generation Y (0.923).

Multi-group analysis on the method used by participants to pay for m-services did not reveal any significant differences between the R<sup>2</sup> values obtained. Similarly, there was no evidence of significant variation of path coefficients between contract and non-contract (pre-paid) users, nor of variation in the moderating effects of innovativeness or convenience.

#### 6. Discussion

Against a backdrop of practical relevance, and a lack of knowledge relating to the way in which consumers' general engagement with the social *media* aspects of organizations progresses to engagement with the social *commerce* aspects, this study contributes to the body of knowledge in a key area relating to social commerce that has received little explicit attention to date: the aim being to contribute towards better understanding of this key success driver and fundamental component of social commerce. Additional novel aspects include the use of the context theory contextualization approach of Hong et al. (2014) during research model development, along with the use of multi-group analysis and slope analysis to facilitate deeper examination of the interplay between model factors. Using a technology acceptance perspective as a theoretical basis, two research models were proposed and tested using primary data gathered from a survey conducted in a developing nation in the Middle East and Africa block. Model 1 explains 57.1% of the variance in BI toward m-payments, while model 2 explains 58.9% of the variance in BI toward m-payments, both with a Q² value of 0.454. The predictive relevance of both models is therefore evident, with the study making a number of theoretical and managerial contributions to existing literature.

### 6.1 Theoretical Contributions and Implications

In keeping with previous work (both in general and specifically within the context of social commerce and mobile technology) not all of the core relationships of TAM received empirical support, with PEOU not having a significant influence on BI (H2). As hypothesised, PU was found to have a significant positive effect on BI (H1), and PEOU was revealed to having a positive and significant influence on PU (H3). These results were identical for both model 1 and model 2. In model 2, a higher level of the moderating effect of innovativeness was revealed to strengthen the positive relationship between PU and BI. However, this moderated relationship was also found to vary according to age, being significant for older participants (Generation X) and non-significant for younger participants (Generation Y). Hence in response to research question (1), and despite ease of use being considered a key requirement of social commerce, results are mixed, with PEOU being found not to significantly influence adoption in this case. Further work on this aspect is therefore appropriate, particularly as the relationship between PU and BI, while significant, is not a simple one, having the potential to be moderated by levels of innovativeness, and the level of moderation being seen in turn to vary according to age.

Moreover, trust was found not to significantly influence BI, hypothesis H4 being marginally rejected in both models. This outcome aligns with the results of Luo et al. (2010) in their study of m-banking, but contrasts with the results of the studies on mobile technologies by Chandra et al. (2010), Chong et al. (2012), and Gu et al. (2009). However, when considering the method used to pay for m-services, a difference was revealed in model 1 between those who were contract-based and those using non-contractual (pre-paid) arrangements, the relationship being significant for contract users, and non-significant for non-contract users. No such difference was apparent in the moderated model 2. Further work on this aspect is therefore desirable, given conflicting views across studies, and across models within this study when consideration is given to moderating effects.

There was strong evidence in this study to support the negative relationship between trust and perceived risk (H5) in both model 1 and model 2, which contrasts with the results of Luo *et al.* (2010) in their study of mbanking. However, the hypothesised negative relationship between risk and BI (H6) found support in model 1, but was revealed to be marginally insignificant in the moderated model 2. Hence, in terms of research question (2), the perception of a secure environment appears to only partially influence the intention to use mobile mpayments. Furthermore, in model 2, and in response to research question (3), results reveal that innovativeness partially mitigates the need for a secure environment (in terms of the impact on perceived risk) when considered in the context of age, the moderating effect being non-significant for older participants, and significant for younger participants. Consequently, the relationship between risk and BI appears to be deceptively complex, varying according to both age and level of personal innovativeness. Additional work would therefore be appropriate in order to further investigate the relationship between broader perceptions of the requirement of a secure environment and consumer intentions to adopt m-payments.

As hypothesised, the positive relationships between innovativeness (H8) and convenience (H7) and BI both found significant support in model 1 and in model 2, with higher levels of innovativeness and convenience leading to greater levels of BI. Hence, in further response to research question (3), personal convenience and the innovativeness of the individual were both revealed to significantly influence the intention to use m-payments. While the relationship between innovativeness and BI remained relatively constant across both models, and in the context of multi-group analyses, some variation was apparent in terms of the relationship between convenience and BI when considering the impact of age. These differences approached significance at the 10%

level in model 1, and demonstrated significance at the 5% level in model 2, indicating that perceptions of convenience relating to m-payments may be age-dependent, suggesting that further work in this respect may be useful.

Given the exploratory nature of this research, and general lack of accompanying empirical work, particularly in terms of the application of a context theory contextualization approach in which inter-relationships between research model factors are manipulated and explored in order to expose hidden interactions, this study is intended to serve as a starting point for further investigations into contextualised perceptions of m-payments, and to further explore some of the issues raised. There are clear limitations in that the sample size was restricted, and data obtained from a single cultural and contextual setting. It would therefore be useful to extend the study to include non-professionals, a broader age range of participants, and also to investigate perceptions of existing (in addition to potential) users of social commerce, including mobile social commerce. Results obtained further suggest that it would be useful to test variations of the models in different cultural settings and to investigate possible issues of measurement invariance across groups/cultures, and in experimental settings.

#### 6.2 Managerial Contributions and Implications

As is the case with mobile commerce (Yang et al., 2012), a key component of the social commerce ecosystem is the ability to make and receive payments in a secure and enjoyable environment, and given the ongoing transfer of social commerce activity to the mobile platform (Hagan, 2015; Lella & Lipsman, 2014), a significant element of the potential for widespread uptake of social commerce would appear to be predicated upon the successful adoption of m-payments. Consequently, the motivation for this study was to investigate human factors influencing the adoption decision by consumers, and while the exploratory nature of the work does not facilitate large-scale policy development, a number of practical organizational and managerial implications may be drawn. The findings are particularly pertinent and of strategic relevance, given the significant investment required to provide and maintain an appropriate and secure application and communications infrastructure (as evidenced by Twitter withdrawing support from its "buy" button).

In addition to the results relating to the hypotheses already documented, calculation of total effects  $(f^2)$ produced a ranking among factors in terms of performance as strategic drivers of m-payment adoption. Additional insights were provided by an impact-performance analysis (Volckner, Sattler, Hennig-Thurau, & Ringle, 2010) conducted at construct level, the combination of these techniques highlighting areas suitable for managerial attention by providing greater understanding of how various constructs impact on the dependent variable (the intention to make use of m-payment technology). Results of this activity suggest that innovativeness has the largest single impact on intention to use m-payments, hence reinforcing the key challenge to organizations operating within social commerce contexts as being to market these facilities in a way that convinces consumers of the desirability of being seen as being innovative, and emphasising the link between the innovative individual and the technology. The second most influential factor in this study was perceived usefulness, closely followed by convenience - providers could therefore potentially increase adoption levels by emphasising these aspects. The implication is that within the cultural context examined, intention to use m-payments is primarily driven by innovativeness, convenience and perceived usefulness. Further work on both organizational and consumer perceptions of the promotion of these aspects would therefore be of use. Perceived ease of use was a moderate performer in terms of total effect on behavioral intention, while trust, and followed some way behind by risk, were found to be the least influential of the factors.

Results of this study therefore imply that in a mobile social commerce context, organizations should emphasise the desirability and contemporary nature of the services, promoting the innovative nature of making purchases, along with the convenience and perceived usefulness of m-payments as part of the social commerce experience. While the concepts of trust and risk do not appear to be unduly significant, appropriate measures and countermeasures should still be emphasised by organizations in order to increase the likelihood of consumers making the adoption decision. Trust may be embedded by building the belief that the anticipated product/service will be provided (positive expectation), while concerns over possible risk may be mitigated by highlighting the anti-fraud security features of the technical infrastructure, and by the provision of financial protection procedures and policies.

It should be noted that the results obtained contrast in places with those of the few other available studies on social commerce/m-payments, suggesting cultural differences between various consumer groups. Providers and marketers of m-payment services should therefore be mindful of this aspect.

#### 7. Conclusions

Given the widespread migration of social media activity to the mobile platform, coupled with the fundamental requirements in the social commerce context of the ability to make and receive payments in a secure, enjoyable, and easy to use environment, much of the potential for social commerce would appear to be predicated upon the widespread adoption of m-payments by social media users. However, little existing research explicitly links the two concepts, particularly in terms of the human factors that motivate consumers to make use of these services. Therefore, in being among the few works to explicitly link the two concepts, and the first to employ a context theory contextualization approach to develop research models and employ multi group and slope analysis to further investigate user perceptions, the paper makes both theoretical and managerial contributions. The study was located in an area with significant growth potential for m-payment use, allowing for comparison of results with those that will eventually emerge from industrialised countries. With hypotheses empirically texted across two related models, model 1 explained 57.1% of the variance in consumer intentions to make use of m-payment technology, while module 2 explained 58.9%. In keeping with the overall aim of the paper, the key conclusions to emerge from the investigation are as follows:

- Perceived innovativeness is a key motivating factor, with higher levels of innovativeness leading to greater intention to adopt m-payment services.
- Calculation of the total effects of constructs contributing significantly to the intention to use mpayment services revealed that perceived innovativeness has the largest impact on intention to use mpayments, followed by perceived usefulness, and convenience.
- Higher levels of trust result in lower levels of risk associated with m-payment use in model 1 and model 2.
- Risk was only found to be significant in model 1. The moderation effects of innovativeness and convenience introduced in model 2 appeared to mitigate perceptions of risk.
- In both model 1 and model 2, higher perceived ease of use leads to greater intention to adopt m-payment services, and to greater perceived usefulness.
- Higher levels of convenience weaken the relationship between PU and intention to use m-payments, while lower levels of convenience strengthen this relationship.

 No differences were found based upon gender as a moderator, whereas age and method used to pay for m-services both revealed differences in the results.

While the exploratory nature of the work (particularly in terms of model manipulation and comparison) does not facilitate large-scale policy development, a number of important implications may be drawn, and areas requiring further investigation identified. Results provide implications for organizations making use of and marketing m-payment services (such as social commerce providers) in terms of being made aware of the need to particularly emphasise the contemporary nature, convenience, usefulness, and ease of use of their facilities. Results also reveal that risk is not necessarily influential, suggesting that there is an element of inherent trust and lack of risk associated with the technology in this cultural setting, although it may be the case that issues of trust and risk are mitigated against to an extent by the level of personal innovativeness of the participants, and perceived convenience of the purchasing ability provided. Further understanding these aspects, along with the implications of integrating specific social commerce constructs (Hajli, 2015) into the models would appear to provide a fruitful area for further work.

Although limitations of the study are acknowledged in terms of the sample size the level of general representation provided by the respondents, and the results pertaining only to one country, findings do provide potential insights into areas requiring further investigation, particularly those which are seen to differ from the evidence provided by the limited body of existing research, and those which are newly revealed as a result of the use of the context theory contextualization approach, in which inter-relationships between research model factors were manipulated and explored in order to expose hidden interactions.

### References

- Aldás-Manzano, J., Ruiz-Mafé, C., & Sanz-Blas, S. (2009). Exploring individual personality factors as drivers of M-shopping acceptance. *Industrial Management & Data Systems*, 109, 739-757. doi:10.1108/02635570910968018
- Alsajjan, B., & Dennis, C. (2010). Internet banking acceptance model: Cross-market examination. *Journal of Business Research*, 63, 957-963. doi:10.1016/j.jbusres.2008.12.014
- Aroean, L., & Michaelidou, N. (2014). A taxonomy of mobile phone consumers: insights for marketing managers. *Journal of Strategic Marketing*, 22(1), 73-89. doi:10.1080/0965254X.2013.876063
- Baethge, C., Klier, J., & Klier, M. (2016). Social commerce—state-of-the-art and future research directions. *Electronic Markets*, 26(3), 269-290. doi:10.1007/s12525-016-0225-2
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16, 74-94. doi:10.1007/BF02723327
- Bai, Y., Yao, Z., & Dou, Y.-F. (2015). Effect of social commerce factors on user purchase behavior: An empirical investigation from renren.com. *International Journal of Information Management*, 35(5), 538-550. doi:https://doi.org/10.1016/j.ijinfomgt.2015.04.011
- Berry, L. L., Seiders, K., & Grewal, D. (2002). Understanding Service Convenience. *Journal of Marketing*, 66(3), 1-17. doi:10.1509/jmkg.66.3.1.18505
- Bianchi, C., Andrews, L., Wiese, M., & Fazal-E-Hasan, S. (2017). Consumer intentions to engage in s-commerce: a cross-national study. *Journal of Marketing Management*, 33(5-6), 464-494. doi:10.1080/0267257X.2017.1319406
- Chandra, S., Srivastava, S., & Theng, Y.-l. (2010). Evaluating the role of trust in consumer adoption of mobile payment systems: An empirical analysis. *communication for the association for Information Systems*, 27, 561-588.
- Chang, S.-J., van Witteloostuijn, A., & Eden, L. (2010). From the Editors: Common method variance in international business research. *Journal of International Business Studies, 41*, 178-184. doi:10.1057/jibs.2009.88
- Chen, J., & Shen, X.-L. (2015). Consumers' decisions in social commerce context: An empirical investigation. *Decision Support Systems*, 79, 55-64. doi:http://dx.doi.org/10.1016/j.dss.2015.07.012
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research* (Vol. 295, pp. 295-336).
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares* (pp. 665-690). Berlin: Springer-Verlag.
- Choi, Y. K., & Totten, J. W. (2012). Self-construal's role in mobile TV acceptance: Extension of TAM across cultures. *Journal of Business Research*, 65, 1525-1533. doi:10.1016/j.jbusres.2011.02.036
- Chong, A. Y. L., Chan, F. T. S., & Ooi, K. B. (2012). Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia. *Decision Support Systems*, *53*, 34-43. doi:10.1016/j.dss.2011.12.001
- Cisco. (2017, 28th March 2017). Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016-2021 White Paper. Retrieved from https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html
- Citrin, A. V., Sprott, D. E., Silverman, S. N., & Stem, D. E. (2000). Adoption of Internet shopping: the role of consumer innovativeness. *Industrial Management & Data Systems*, 100(7), 294-300. doi:doi:10.1108/02635570010304806
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences. *Statistical Power Analysis for the Behavioral Sciences*, 2nd, 567. doi:10.1234/12345678
- Colquitt, J. A., Scott, B. A., & LePine, J. A. (2007). Trust, trustworthiness, and trust propensity: a meta-analytic test of their unique relationships with risk taking and job performance. *The Journal of applied psychology*, 92, 909-927. doi:10.1037/0021-9010.92.4.909
- Dahlberg, T., Guo, J., & Ondrus, J. (2015). A critical review of mobile payment research. *Electronic Commerce Research and Applications*, 14(5), 265-284.
- Davis, L., Wang, S., & Lindridge, A. (2008). Culture influences on emotional responses to on-line store atmospheric cues. *Journal of Business Research*, *61*, 806-812. doi:10.1016/j.jbusres.2007.08.005
- de Kerviler, G., Demoulin, N. T. M., & Zidda, P. (2016). Adoption of in-store mobile payment: Are perceived risk and convenience the only drivers? *Journal of Retailing and Consumer Services*, *31*, 334-344. doi:http://doi.org/10.1016/j.jretconser.2016.04.011
- Faugier, J., & Sargeant, M. (1997). Sampling hard to reach populations. *Journal of advanced nursing*, 26, 790-797. doi:10.1046/j.1365-2648.1997.00371.x
- Featherman, M. S., & Hajli, N. (2016). Self-Service Technologies and e-Services Risks in Social Commerce Era. *Journal of Business Ethics*, *139*(2), 251-269. doi:10.1007/s10551-015-2614-4

- Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. International Journal of Human Computer Studies, 59, 451-474. doi:10.1016/S1071-5819(03)00111-3
- Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, *18*, 382-388. doi:10.2307/3150980
- Forsythe, S. M., & Shi, B. (2003). Consumer patronage and risk perceptions in Internet shopping. *Journal of Business Research*, 56, 867-875. doi:10.1016/S0148-2963(01)00273-9
- Gao, L., & Waechter, K. A. (2015). Examining the role of initial trust in user adoption of mobile payment services: an empirical investigation. *Information Systems Frontiers*, 1-24. doi:10.1007/s10796-015-9611-0
- Gao, T. T., Rohm, A. J., Sultan, F., & Pagani, M. (2013). Consumers un-tethered: A three-market empirical study of consumers' mobile marketing acceptance. *Journal of Business Research*, 66, 2536-2544. doi:10.1016/j.jbusres.2013.05.046
- Glover, S., & Benbasat, I. (2011). A Comprehensive Model of Perceived Risk of E-Commerce Transactions. *International Journal of Electronic Commerce*, 15, 47-78. doi:10.2753/JEC1086-4415150202
- Gonçalves Curty, R., & Zhang, P. (2013). Website features that gave rise to social commerce: a historical analysis. *Electronic Commerce Research and Applications*, *12*(4), 260-279. doi:https://doi.org/10.1016/j.elerap.2013.04.001
- Gu, J. C., Lee, S. C., & Suh, Y. H. (2009). Determinants of behavioral intention to mobile banking. *Expert Systems with Applications*, *36*, 11605-11616. doi:10.1016/j.eswa.2009.03.024
- Hagan, M. (2015). The merging of social media, payments and mobile. *Mobile Payments Today*. Retrieved from https://www.mobilepaymentstoday.com/articles/the-merging-of-social-media-payments-and-mobile/
- Hair, J., Celsi, M., Money, A., Samouel, P., & Page, M. (2014). Essentials of business research methods (2nd ed.). New York: M.E. Sharp.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
- Hajli, N. (2015). Social commerce constructs and consumer's intention to buy. *International Journal of Information Management*, 35(2), 183-191. doi:http://dx.doi.org/10.1016/j.ijinfomgt.2014.12.005
- Hajli, N., Shanmugam, M., Powell, P., & Love, P. E. D. (2015). A study on the continuance participation in online communities with social commerce perspective. *Technological Forecasting and Social Change*, 96, 232-241. doi:https://doi.org/10.1016/j.techfore.2015.03.014
- Hajli, N., & Sims, J. (2015). Social commerce: The transfer of power from sellers to buyers. *Technological Forecasting and Social Change*, *94*, 350-358. doi:http://dx.doi.org/10.1016/j.techfore.2015.01.012
- Hajli, N., Sims, J., Zadeh, A. H., & Richard, M.-O. (2017). A social commerce investigation of the role of trust in a social networking site on purchase intentions. *Journal of Business Research*, 71, 133-141. doi:https://doi.org/10.1016/j.jbusres.2016.10.004
- Hajli, N., Wang, Y., Tajvidi, M., & Hajli, M. S. (2017). People, Technologies, and Organizations Interactions in a Social Commerce Era. *IEEE Transactions on Engineering Management*, PP(99), 1-11. doi:10.1109/TEM.2017.2711042
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. doi:10.1007/s11747-014-0403-8
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International Marketing Review*, *33*(3), 405-431. doi:doi:10.1108/IMR-09-2014-0304
- Hew, J.-J., Lee, V.-H., Ooi, K.-B., & Lin, B. (2016). Mobile social commerce: The booster for brand loyalty? *Computers in Human Behavior*, *59*, 142-154. doi:https://doi.org/10.1016/j.chb.2016.01.027
- Hong, W., Chan, F. K. Y., Thong, J. Y. L., Chasalow, L. C., & Dhillon, G. (2014). A framework and guidelines for context-specific theorizing in information systems research. *Information systems research*, 25, 111-136. doi:10.1287/isre.2013.0501
- Huang, Z., & Benyoucef, M. (2013). From e-commerce to social commerce: A close look at design features. *Electronic Commerce Research and Applications, 12*(4), 246-259. doi:https://doi.org/10.1016/j.elerap.2012.12.003
- Huang, Z., & Benyoucef, M. (2015). User preferences of social features on social commerce websites: An empirical study. *Technological Forecasting and Social Change*, 95(Supplement C), 57-72. doi:https://doi.org/10.1016/j.techfore.2014.03.005
- Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, 26, 310-322. doi:10.1016/j.chb.2009.10.013
- Kim, S., & Garrison, G. (2009). Investigating mobile wireless technology adoption: An extension of the technology acceptance model. *Information Systems Frontiers*, 11(3), 323-333. doi:10.1007/s10796-008-9073-8

- Kim, S., & Park, H. (2013). Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance. *International Journal of Information Management*, 33(2), 318-332. doi:https://doi.org/10.1016/j.ijinfomgt.2012.11.006
- Ko, E., Kim, E. Y., & Lee, E. K. (2009). Modeling consumer adoption of mobile shopping for fashion products in Korea. *Psychology and Marketing*, *26*, 669-687. doi:10.1002/mar.20294
- Lella, A., & Lipsman, A. (2014). The U.S. Mobile App Report. *comScore Whitepaper*. Retrieved from http://www.comscore.com/Insights/Presentations-and-Whitepapers/2014/The-US-Mobile-App-Report?cs edgescape cc=GB
- Liang, T.-P., & Turban, E. (2011). Introduction to the Special Issue Social Commerce: A Research Framework for Social Commerce. *International Journal of Electronic Commerce*, *16*(2), 5-14. doi:10.2753/JEC1086-4415160201
- Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). Antecedents of the adoption of the new mobile payment systems: The moderating effect of age. *Computers in Human Behavior*, *35*, 464-478. doi:10.1016/j.chb.2014.03.022
- Lin, X., Li, Y., & Wang, X. (2017). Social commerce research: Definition, research themes and the trends. *International Journal of Information Management*, *37*(3), 190-201. doi:https://doi.org/10.1016/j.ijinfomgt.2016.06.006
- Lu, B., Fan, W., & Zhou, M. (2016). Social presence, trust, and social commerce purchase intention: An empirical research. *Computers in Human Behavior*, *56*, 225-237. doi:http://dx.doi.org/10.1016/j.chb.2015.11.057
- Luarn, P., & Lin, H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, *21*, 873-891. doi:10.1016/j.chb.2004.03.003
- Luo, X., Li, H., Zhang, J., & Shim, J. P. (2010). Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: An empirical study of mobile banking services. *Decision Support Systems*, 49, 222-234. doi:10.1016/j.dss.2010.02.008
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of management review*, 20, 709-734. doi:10.5465/AMR.1995.9508080335
- Mayville, E. (2017). What Twitter's dead buy button means for social commerce. *Campaign*. Retrieved from http://www.campaignlive.co.uk/article/twitters-dead-buy-button-means-social-commerce/1422170
- Morgan-Thomas, A., & Veloutsou, C. (2013). Beyond technology acceptance: Brand relationships and online brand experience. *Journal of Business Research*, 66, 21-27. doi:10.1016/j.jbusres.2011.07.019
- Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, *61*, 404-414. doi:http://doi.org/10.1016/j.chb.2016.03.030
- Pavlou, P. A., Huigang, L., & Yajiong, X. (2007). Understanding and Mitigating Uncertainty in Online Exchange Relationships: a Principal--Agent Perspective. *MIS Quarterly, 31*, 105-136. doi:Article
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *The Journal of applied psychology*, 88, 879-903. doi:10.1037/0021-9010.88.5.879
- Rigdon, E. E. (2012). Rethinking Partial Least Squares Path Modeling: In Praise of Simple Methods. *Long Range Planning*, 45, 341-358. doi:10.1016/j.lrp.2012.09.010
- Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of management review*, 23, 393-404. doi:10.5465/AMR.1998.926617
- Sarstedt, M., Ringle, C. M., Henseler, J., & Hair, J. F. (2014). On the Emancipation of PLS-SEM: A Commentary on Rigdon (2012). *Long Range Planning*, 47, 154-160. doi:10.1016/j.lrp.2014.02.007
- Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, *9*, 209-216. doi:10.1016/j.elerap.2009.07.005
- Shen, S. (2016). Market Trends: Mobile Payment The Way Forward. Retrieved from https://www.gartner.com/doc/3048722/market-trends-mobile-payment-
- Sichtmann, C., & Diamantopoulos, A. (2013). The impact of perceived brand globalness, brand origin image, and brand origin-extension fit on brand extension success. *Journal of the Academy of Marketing Science*, 41, 567-585. doi:10.1007/s11747-013-0328-7
- Silbert, S. (2015). How mobile payments will grow in 2016. *Fortune*. Retrieved from http://fortune.com/2015/10/29/mobile-payments-grow-2016/
- Statista. (2018a). Global mobile social network penetration rate as of January 2018. Retrieved from https://www.statista.com/statistics/269615/social-network-penetration-by-region/
- Statista. (2018b). Social media usage worldwide. Retrieved from https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/

- Thakur, R., & Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. *Internet Research*, 24(3), 369-392. doi:doi:10.1108/IntR-12-2012-0244
- van der Heijden, H., Verhagen, T., & Creemers, M. (2003). Understanding online purchase intentions: contributions from technology and trust perspectives. *European Journal of Information Systems*, 12, 41-48. doi:10.1057/palgrave.ejis.3000445
- Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46, 186-204. doi:10.1287/mnsc.46.2.186.11926
- Vincent-Wayne, M. (1999). Consumer perceived risk: conceptualisations and models. *European Journal of Marketing*, 33, 163-195. doi:10.1108/03090569910249229
- Volckner, F., Sattler, H., Hennig-Thurau, T., & Ringle, C. M. (2010). The Role of Parent Brand Quality for Service Brand Extension Success. *Journal of Service Research*, *13*, 379-396. doi:10.1177/1094670510370054
- Wang, C., & Zhang, P. (2012). The Evolution of Social Commerce: The People, Management, Technology, and Information Dimensions. *Communications of the Association for Information Systems*, 31(5).
- Wong, C.-H., Tan, G. W.-H., Tan, B.-I., & Ooi, K.-B. (2015). Mobile advertising: The changing landscape of the advertising industry. *Telematics and Informatics*, 32(4), 720-734. doi:https://doi.org/10.1016/j.tele.2015.03.003
- Wu, J. H., & Wang, S. C. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information and Management*, 42, 719-729. doi:10.1016/j.im.2004.07.001
- Xu, G., & Gutiérrez, J. A. (2007). An Exploratory Study of "Killer Applications" and Critical Success Factors in M-Commerce. Web Technologies for Commerce and Services Online, 231.
- Yang, S., Lu, Y., Gupta, S., Cao, Y., & Zhang, R. (2012). Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behavior*, 28(1), 129-142. doi:https://doi.org/10.1016/j.chb.2011.08.019
- Zhang, H., Lu, Y., Gupta, S., & Zhao, L. (2014). What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. *Information & Management*, *51*(8), 1017-1030. doi:https://doi.org/10.1016/j.im.2014.07.005
- Zhang, K. Z. K., & Benyoucef, M. (2016). Consumer behavior in social commerce: A literature review. *Decision Support Systems*, 86(Supplement C), 95-108. doi:https://doi.org/10.1016/j.dss.2016.04.001
- Zhou, L., Zhang, P., & Zimmermann, H.-D. (2013). Social commerce research: An integrated view. *Electronic Commerce Research and Applications*, 12(2), 61-68.
- Zhou, T. (2013). An empirical examination of continuance intention of mobile payment services. *Decision Support Systems*, 54(2), 1085-1091. doi:10.1016/j.dss.2012.10.034
- Zilles, C. (2017). Pinterest Might Be The First Social Network To Figure Out Social Commerce. SocialMediaHQ. Retrieved from http://socialmediahq.com/pinterest-might-first-social-network-figure-social-commerce/

#### Appendix. Measurement Items and Sources

Constructs	Measurement Items	Sources
Intention to Use	Intent1: Given the opportunity, I would use mobile payments	Schierz et al. (2010)
	Intent2: I am likely to use mobile payments in the near future	
	Intent3: I am willing to use mobile payments in the near future	
	Intent4: Five (5) years from now I intend to pay for purchases with a mobile device (removed)	Kim et al. (2010)
Convenience	Conv1: Mobile payment would be convenient as I usually carry a mobile device	Kim et al. (2010)
	Conv2: Mobile payment would be convenient as I can use it anytime	
	Conv3: Mobile payment would be convenient as I can use it in any situation	
Personal	Innov1: If I heard about a new information technology, I would seek ways to experiment with it.	Yang et al. (2012)
Innovativeness	Innov2: Among my peers, I am usually the first to explore new information technologies	
	Innov3: I like to experiment with new information technologies	
	Innov4 (reversed): In general, I am hesitant to try out new information technologies (removed)	
Perceived Ease	PEOU1: It would be easy to become skillful at using mobile payments	Schierz et al. (2010)
of Use	PEOU2: The interaction with mobile payments would be clear and understandable	
	PEOU3: It would be easy to perform the steps required to use mobile payments	
Perceived	PU1: Mobile payments would be a useful mode of payment	Schierz et al. (2010)
Usefulness	PU2: Using mobile payments would make the handling of payments easier	
	PU3: Mobile payments would allow for a faster purchasing	
	PU4: By using mobile payments, my purchasing speed and flexibility would be improved	
Risk	Risk1 Other people can know information about my transactions if I use mobile payments	Liébana-Cabanillas et
	Risk2 There is high potential for financial loss if I make purchases using mobile payments	al. (2014)
	Risk3: There is significant risk in making purchases via social networks using mobile payments	
Trust	Trust1: Mobile payment providers can be trusted to keep promises and commitments	Zhou (2013)
	Trust2: Mobile payments are trustworthy	
	Trust3: Mobile payment providers would keep my interests in mind	

# RE: Computers in Human Behavior

# **Highlights for the article:**

Social Commerce and the Mobile Platform: Payment and Security Perceptions of Potential Users

- Examines opinions of key aspects of mobile social commerce among potential-users.
- Employs a context theory contextualization approach to research model development.
- Results suggest perceptions of security less important than innovativeness of user.
- Multi-group and slope analysis used to augment investigation approach.
- Differences in results apparent according to category of participant.