*Related content and download information correct at time of download.

Exploring individual personality factors as drivers of M-shopping acceptance

Joaquín Aldás-Manzano, Carla Ruiz-Mafé and Silvia Sanz-Blas

Department of Marketing, University of Valencia, Valencia, Spain

Abstract

Purpose – The purpose of this paper is to evaluate how personality variables related to technology (innovativeness, compatibility and affinity) can modify the influence of classical technology acceptance model (TAM) variables on behavioural adoption intention of mobile shopping.

Design/methodology/approach – The impact of innovativeness, compatibility, affinity, TAM beliefs (ease of use and usefulness) and attitude on mobile shopping adoption is tested through structural equation modelling techniques. The sample consisted of 470 Spanish mobile telephone users selected on the basis of convenience.

Findings – Data analysis shows that the effect of perceived usefulness and, in a minor degree, perceived ease of use are over dimensioned if personality variables are omitted making intention formation to be perceived as more rational than it really is. Personality variables (affinity to mobile telephones, compatibility and innovativeness) have a direct and positive influence on the intention to engage in M-shopping.

Practical implications – This research enables mobile shopping agents to know what aspects to highlight in their communication strategies to increase the M-services adoption rate. The complementary use of the mobile and the internet is recommended since the similarities between both methods may favour the acceptance of distance shopping systems. Mobile services should not be simply designed as easy to use, but also as an enjoyable experience.

Originality/value – Despite the importance of personality factors on mobile shopping adoption, they were explicitly ignored when the unified theory of acceptance and use of technology was formulated. This research does not try to propose an extension of the TAM model, but analyses the degree in which the explicit rejection of personality variables could impoverish its performance.

Keywords Mobile communication systems, Electronic commerce, Innovation, Consumer behaviour, Spain

Paper type Research paper

1. Introduction

Mobile commerce has frequently been proclaimed the new service frontier (Kleijnen *et al.*, 2007). Increased mobile usage in recent years is a clear example of the system's growth, significance and the opportunities it offers as an independent sales channel, and therefore merits special attention from researchers. As the number of mobile telecom users increases, the decline in conventional voice service tariffs has reduced the average revenue per user making mobile value-added services, like mobile shopping, a new opportunity for providers to increase revenue (Kuo and Yen, 2009). As the future commercial success of the mobile phone depends to some extent on whether

current mobile phone users also use this medium for product purchases, it becomes crucial to analyze which variables determine M-shopping acceptance.

Since, Venkatesh *et al.* (2003) formulated their unified theory of acceptance and use of technology (UTAUT), the need for researchers to choose from among a multitude of models has decreased as the most prominent contributions of the theory of reasoned action (TRA), technology acceptance model (TAM), motivational model, theory of planned behaviour, innovation diffusion theory and social cognitive theory were successfully integrated. But it is frequently forgotten that most of these models, and mainly their integrator UTAUT, were conceived in an organizational environment, and their root constructs are basically utilitarian: performance expectancy, effort expectancy, social influence and facilitating conditions.

The organisational focus of this integration has meant that individual personality variables are consciously and explicitly postulated not to be a direct determinant of intention: intrinsic motivations (Davis *et al.*, 1992), affect towards use (Thompson *et al.*, 1991) or affect (Compeau *et al.*, 1999). However, some of the UTAUT integrating models have showed a great efficacy to explain the use intention or the use itself of a wide range of technologies also by final consumers. By way of example, TAM has been successfully used to explain the use intention of online shopping (O'Cass and Fenech, 2003), mobile commerce (Kuo and Yen, 2009; Yang, 2005) and mobile banking (Luarn and Lin, 2005). The question that arises is what role can be attributed to the personality variables that were explicitly excluded in the final consumer context when the rest of the model works reasonably well in this context. As Baron *et al.* (2006) point out, the current research approaches are probably reaching their limits in terms of explaining behavioural intention and they call for the identification of constructs that predict behaviour beyond what is already known through the UTAUT.

In this paper, we focus on three variables that approximate the fit between the individual personality and the mobile phones medium: innovativeness or the degree of interest in trying a new concept, or an innovative product or service (Rogers, 1995); affinity, conceptualised as the perceived importance of the medium in the life of the individual (Rubin, 1981) and compatibility or "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters (Rogers, 1995, p. 224). TAM is used as the baseline model in relation to which the influence of the abovementioned variables is evaluated. Our objective is not to propose an extension of the TAM model, but to analyse the degree to which the explicit rejection of personality variables may have impoverished its performance. TAM has been chosen as the baseline model as it is the one of the UTAUT model components which has received extensive empirical support through validations, applications and replications for its power to predict use of information systems (Baron *et al.*, 2006; Lu *et al.*, 2003).

The study is divided into three parts. In Section 2, the model employed in this study is presented, focusing on the rationale of the constructs used and deriving testable hypotheses. In Section 3, design, sample and measures are presented and validated. Finally, the results are presented and managerial implications are discussed.

2. Literature review and research hypotheses
2.1 Innovativeness
Innovativeness is a personality construct that reflects whether individuals are willing to adopt products or ideas that are new in the context of their individual experience.

Innovativeness is possessed to a lesser or greater degree by all individuals (Citrin *et al.*, 2000).

Innovativeness has been conceptualized and measured in a number of ways but two main types of innovativeness have emerged: open-processing and domain-specific innovativeness. Open-processing innovativeness focuses on a cognitive style which incorporates an individual's intellectual, perceptual and attitudinal characteristics (Joseph and Vyas, 1984).

Gatignon and Roberts (1985) found little overlap in innovativeness across product or domain categories, suggesting that innovation is fairly product or domain-specific. Therefore, a limitation of the general approach to innovativeness is that consumer innovation may be more domain-specific. Owing to this limitation, Goldsmith and Hofacker (1991) developed a measurement of the scale of domain-specific innovativeness. Domain-specific innovativeness is the tendency to learn about and adopt innovations within a specific domain of interest (Goldsmith and Hofacker, 1991). Previous research evidenced that domain-specific measures are more predictive of the purchase of new items than global innovativeness (Goldsmith *et al.*, 1995; Goldsmith and Hofacker, 1991; Hirschman, 1980).

A set of studies-related consumer innovativeness and intention to shop. Eastlick and Lotz (1999) show that innovators are heavy users of interactive electronic shopping media and that the strongest predictors of potential innovator group membership were: perceived advantages of interactive shopping innovation over traditional shopping channels and compatibility with lifestyles. The study by Limayern *et al.* (2000) found that innovativeness influences internet shopping behaviour both directly and indirectly through consumers' attitude and intentions. Goldsmith (2000) also evidenced that frequency of online shopping and future online shopping intention were predicted by general innovativeness, an innovative predisposition toward buying online and involvement with the internet. Citrin *et al.* (2000) supported this conclusion with their findings that domain-specific innovativeness along with internet usage directly influences consumers' behaviour to adopt internet shopping.

Therefore:

H1. Consumer innovativeness will have a positive effect on M-shopping intention.

2.2 Mobile affinity

Uses and gratifications research is based on the assumption that people actively seek out and consume media content to gratify their needs and fulfil their various interests (Katz *et al.*, 1974). Media affinity, conceptualized as the importance of a medium in the lives of individuals (Perse, 1986; Rubin, 1981), has been utilized to assess the attitudes of individuals towards the medium and its content (Perse, 1986; Rubin, 1981; Rubin and Perse, 1988). Although studies focused on electronic media showed media affinity as an important factor that influences media dependency and future purchase intentions (Bigné *et al.*, 2007; Ruiz and Sanz, 2006), only limited work has been carried out to identify the role of affinity in M-shopping adoption.

There is evidence that the closer an individual's relationship with a medium is, the greater the probability they will make purchases based on the content observed (Ball-Rokeach, 1985; Defleur and Ball-Rokeach, 1989). Previous studies have found a positive, significant association between affinity and levels of televiewing (Perse, 1986; Rubin, 1981; Rubin and Perse, 1988). It has also been found that this variable is one of

the most significant predictors for certain medium relations such as dependency, parasocial interaction and cultivation effects (Perse, 1986). Ruiz and Sanz (2006) found that there is a positive correlation between internet affinity and internet dependency and that the intention to shop via internet can be the result of particularly intense internet dependency. This leads us to suggest that affinity with the mobile phone can also help to intensify shopping by mobile phone. To complement the findings of the literature review, we addressed the following hypothesis on the mobile affinity/M-commerce relation:

> *H2.* Mobile affinity has a favourable influence on M-shopping intention.

2.3 Technology cluster: distance shopping experience as compatibility indicator
As it was previously pointed out, Rogers (1995) defined compatibility as the degree to which an innovation is consistent with the past experiences and needs of potential adopters, identifying this variable as a critical factor in the consumer adoption decision. Accordingly, the technology cluster concept (Rogers, 1995) posits that consumers are likely to adopt a technology offering the same functions as those already adopted. Previous experience using distance shopping tools like internet, may be considered as an indicator of technological compatibility, as we are considering the use of mobile phones for the same function: distance shopping. Consumers' use of technological devices is increasing rapidly and devices based on mobile technology are now commonplace in everyday life. Moreover, multimedia mobile telephony has changed mere telephones into the equivalent of a laptop computer. In addition to basic mobile services such as communication and the sending of messages, the new terminals allows consumers to navigate the internet, access TV, listen to the radio, use videoconferencing services, chats and information services, among others. As Sooryamoorthy *et al.* (2008) pointed out, consumers can be characterized as users of multiple communications media: mobile phones are becoming a part of their "technology cluster" involving computers, connectivity, internet and e-mail use. With explosive growth of the mobile phone population combined with the development of multimedia devices, the technology cluster concept may indeed hold important keys to the development of meaningful and effective plans for advertising mobile services.

The technology cluster concept has been used to examine the acceptance of videotext (Larose and Atkin, 1992), e-commerce (Eastin, 2002), M-internet (Cheong and Park, 2005) and mobile commerce (Yang, 2005). Yang's (2005) study based on a sample of Singapore students evidenced that consumer past adoption of technologies related to M-commerce positively influences M-commerce perceptions. Eastin's (2002) study developed in the USA, analyzes four e-commerce activities (i.e. online shopping, banking, investing and electronic payment system) found that prior technology adoption is one of the key drivers of the adoption decision. Research by Cheong and Park (2005) also evidenced that internet experience positively influences consumer beliefs about M-internet.

Technologically oriented individuals do not use technologies in isolation, but utilize a cluster of technologies to enrich their communications repertoire. Rice and Katz (2003) report similar adoption patterns for mobile phone and internet use. This finding highlights the complementarity of technologies in which users tend to adopt other innovations with broadly similar functions. Previous research has also highlighted

that the more contact there is with one communication medium, the more contact there will be with others (Boase *et al.*, 2006; Sooryamoorthy *et al.*, 2008).

It should be highlighted that some prior experience with distance shopping channels has a positive influence on the acceptance of new direct shopping channels, since the consumer acquires skill in purchasing products/services with no prior physical inspection (Korgaonkar and Moschis, 1987; Shim and Drake, 1990). Research by Eastlick and Lotz (1999) focused on teleshopping shows that a consumer's prior shopping experiences with other distance retail channels are the strongest predictors of teleshopping acceptance.

Mobile shopping offers features, such as time saving, convenience, variety and range of assortment and lower prices, which are similar to those offered by other distance shopping channels such as internet. Therefore, it is to be expected that consumers with internet shopping experience have a stronger intention to engage in M-shopping than those who have never used internet as a shopping channel.

Therefore, we propose the following hypothesis:

H3. Internet compatibility has a favourable influence on M-shopping intention.

2.4 The technology acceptance model

Building on the TRA (Fishbein and Ajzden, 1975), Davis (1989) and Davis *et al.* (1989) proposed the TAM to explain and predict the acceptance and use of information technology. The TAM posits that perceived usefulness and perceived ease of use are two key determinants of technology acceptance. Attending Davis *et al.* (1989), the perceived ease of use was defined as the degree to which a person believes that using a particular system would be free of effort. Perceived usefulness was described as the degree to which a person believes that using a particular system would enhance his or her job performance. In addition, the TAM model contained the attitude toward using, behavioural intention to use and actual use constructs. According to the TAM, both perceived usefulness and perceived ease of use influence the attitude of individuals towards the use of a particular technology, while attitude and perceived usefulness predict the individual's behavioural intention to use the technology. Perceived usefulness is also influenced by perceived ease of use.

The TAM is considered an influential research model for explaining information technology acceptance (O'Cass and Fenech, 2003; Yang, 2005). Many studies have used the TAM to predict the acceptance and use of information technologies such as electronic mail and the world wide web (Fenech, 1998; Gefen and Straub, 1997), internet shopping (O'Cass and Fenech, 2003), online games (Hsu and Lu, 2004), e-learning (Lee, 2006) and SMS messages (Baron *et al.*, 2006). Hence, while the TAM is specifically tailored to the acceptance of computer-based technologies, its robust and parsimonious structure has allowed applications in other contexts of technological adoption. M-commerce may be regarded as an extension of electronic commerce to wireless media (Coursaris and Hassanein, 2002).

The following hypotheses summarize the core TAM proposals, while Figure 1 shows the conceptual model examined here:

H4. Perceived ease of use has a positive effect on the perceived usefulness of M-shopping.

H5. Perceived ease of use has a positive effect on attitude toward M-shopping.
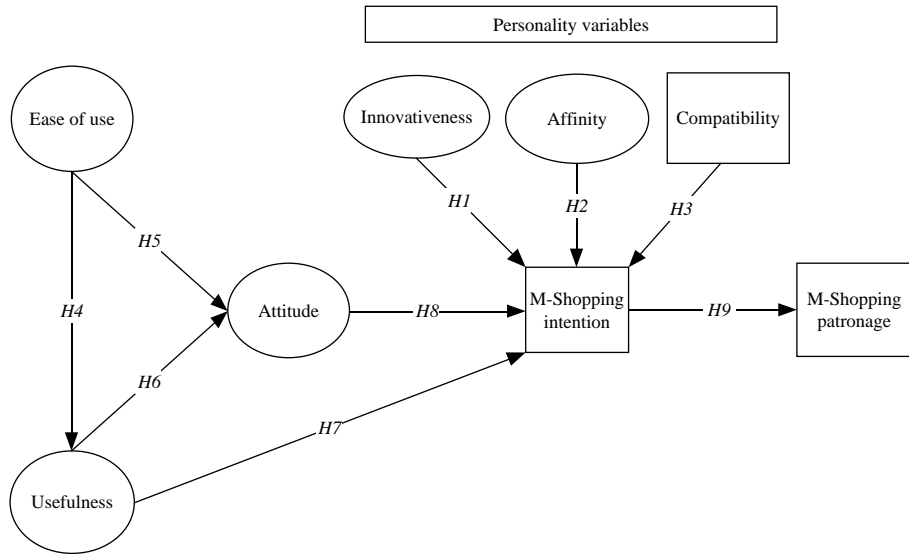
Figure 1.
Conceptual model

H6. Perceived usefulness has a positive effect on attitude toward M-shopping.

H7. Perceived usefulness has a positive effect on mobile phone users' M-shopping intention.

H8. Attitude toward M-shopping has a positive effect on M-shopping intention.

H9. M-shopping intention has a positive effect on M-shopping patronage.

3. Method

3.1 Sample and data collection

The sample consisted of 470 mobile telephone users selected on the basis of convenience. This non-probabilistic sampling method is frequently used in M-shopping studies (Wu and Wang, 2005; Yang, 2005). The field work was developed from April to June 2006 and the sample included both M-shoppers and non-M-shoppers. A questionnaire with close-ended questions was used for this study.

In this study, final questionnaires were delivered to and collected from Spanish mobile users over 14 years old. The success of mobile services in Spain is evidenced by the number of current and potential mobile users. At present, the Spanish mobile market has a penetration rate of 109 per cent with 49 million mobile subscribers and 9.8 million 3G services subscribers (Netsize, 2008).

Table I displays demographic and usage variables associated with the sample. Respondents were mainly young (69 per cent below 30 years old) and well-educated (68.2 per cent secondary level or above). Most of the respondents had never used a mobile phone to buy any kind of service (71.3 per cent). Ringtones (22.5 per cent), logos (17.0 per cent) and MP3 songs (16.8 per cent) were the most frequently acquired services through the mobile shopping channel.

Variable	Column percentage
Gender	
Male	54.0
Female	46.0
Total	100.0
Education	
Below primary	2.5
Primary	29.3
Secondary	38.7
University	29.5
Total	100.0
Age	
14-19	36.3
20-29	32.7
30-39	10.6
40-49	9.3
50-59	9.6
60 and older	1.5
Total	100.0
M-shopping patronage	
M-shoppers	28.7
Non-M-shoppers	71.3
Total	100.0
Acquired services	
Logos	17.0
Ringtones	22.5
Songs	16.8
Videos	5.7
Mobile credit for calls	12.1
News	4.0
SMS to vote on a TV program	9.6
SMS to participate in a draw	8.9

Note: $n = 470$

Table I.
Sample demographics

3.2 Measures

The constructs used in our study were adapted from previous studies and measured by multiple item five-point Likert-type scales, with the exception of M-shopping intention (one item), M-shopping patronage (one item) and compatibility (one item), as shown in more detail in the Appendix, Table AI.

3.3 Reliability and validity assessment

To assess measurement reliability and validity, a confirmatory factor analysis (CFA) containing all the multi-item constructs in our framework was estimated with EQS 6.1 (Bentler, 1995) using the maximum likelihood method. Raw data screening showed evidence of non-normal distribution (Mardia's coefficient normalized estimate = 45.9) and although other estimation methods have been developed for use when the normality assumption does not hold, the recommendation of Chou *et al.* (1991) and Hu *et al.* (1992) for correcting the statistics rather than using a different estimation model have been followed. So, robust statistics (Satorra and Bentler, 1988) will be provided.

An initial CFA led to the deletion of six items based on non-significant or low-loading estimates (below 0.50), patterns of residuals and Lagrange multiplier tests (Anderson and Gerbing, 1988; Hatcher, 1994). The results of the final CFA are reported in Table II and suggest that our final measurement model provides a good fit to the data on the basis of a number of fit statistics (S-B $\chi^2 = 672.66$, df $= 265$, $p = 0.00$; root mean square error of approximation – RMSEA $= 0.058$; normed fit index – NFI $= 0.91$; non-normed fit index – NNFI $= 0.93$; comparative fit index – CFI $= 0.940$). As evidence of convergent validity, the CFA results indicate that all items are significantly ($p < 0.01$) related to their hypothesized factors, and the size of all the standardized loadings are higher than 0.60 (Bagozzi and Yi, 1988) and the average of the item-to-factor loadings are higher than 0.70 (Hair *et al.*, 1998).

Table II also demonstrates the high-internal consistency of the constructs. In each case, Cronbach's alpha exceeded Nunnally and Bernstein's (1994) recommendation of 0.70. Composite reliability represents the shared variance among a set of observed variables measuring an underlying construct (Fornell and Larcker, 1981). Generally, a composite reliability of at least 0.60 is considered desirable (Bagozzi and Yi, 1988). This requirement is met for every factor. Average variance extracted (AVE) was also calculated for each construct, resulting in AVEs greater than 0.50 (Fornell and Larcker, 1981).

Evidence for discriminant validity of the measures was provided in two ways (Table III). First, none of the 95 per cent confidence intervals of the individual elements of the latent factor correlation matrix contained a value of 1.0 (Anderson and Gerbing, 1988). Second, the shared variance between pairs of constructs was always less than the corresponding AVE (Fornell and Larcker, 1981). On the basis of these criteria, we concluded that the measures in the study provided sufficient evidence of reliability, convergent and discriminant validity.

CFA results show that it is not reasonable to expect that all indicators load on a single factor, what can be considered a Harman's single factor test that corroborates the absence of common method bias.

4. Results

We tested the proposed conceptual model (Figure 1) using structural equation modelling in two steps. First, we established the baseline of our comparison by estimating classical TAM (Model 1). Second, we incorporated to Model 1 the consumer personality variables (Model 2). Data fit both conceptual models acceptably (Table IV) as will be discussed afterwards. Our first objective is to evaluate if personality variables are relevant to add value to the baseline model. Four indicators have been used to compare both models. The Akaike's information criterion – AIC (Akaike, 1973) and consistent AIC – CAIC (Bozgodan, 1987) are used as they adjust model χ^2 to penalize for model complexity, that is, for lack of parsimony and overparametrization as it should be taken into account that Model 2 is significantly more complex than Model 1. The lower are the values, the better the fit. RMSEA is also used as it penalizes for lack of parsimony on the rationale that more complex models will, all other things equal, generate better fit than less complex ones. Hu and Bentler (1999) have suggested 0.06 as the cut-off for a good model fit. Finally, the R^2 for M-shopping intention as the variable which is hypothesized to be influenced by personality variables, is provided. As in Model 1, it is predicted by two variables (attitude and usefulness) and in Model 5 by five of them (as personality variables are added), corrected R^2 is used to provide

Variable	Indicator	Factor loading	Robust t-value	Loading average	Cronbach's alpha	Composite reliability	AVE
Usefulness	USE1	0.61**	13.81	0.79	0.91	0.91	0.64
	USE2	0.88***	28.43				
	USE3	0.87***	27.38				
	USE4	0.80***	22.50				
	USE5	0.83***	27.27				
	USE6	0.77***	19.54				
Ease of use	EASE1	0.72***	18.17	0.70	0.74	0.74	0.49
	EASE4	0.69***	16.02				
	EASE6	0.69***	15.87				
Affinity	AFF1	0.70***	14.49	0.74	0.83	0.83	0.55
	AFF2	0.77***	20.86				
	AFF3	0.77***	25.17				
	AFF5	0.72***	19.69				
Innovativeness	INN3	0.68***	28.47	0.74	0.70	0.71	0.55
	INN4	0.81***	32.07				
Attitude	ATT1	0.79***	30.28	0.76	0.93	0.93	0.59
	ATT2	0.69***	29.04				
	ATT3	0.82***	17.15				
	ATT4	0.87***	14.93				
	ATT5	0.88***	20.36				
	ATT6	0.86***	18.49				
	ATT7	0.68***	18.87				
	ATT8	0.62***	22.09				
	ATT9	0.74***	19.82				
	ATT10	0.70**	17.43				

Notes: S-B χ^2(df = 265) = 672.66 ($p < 0.00$); NFI = 0.906; NNFI = 0.933; CFI = 0.940; RMSEA = 0.058; $^*p < 0.05$; $^{**}p < 0.01$; $n = 470$; AVE = average variance extracted

Table II.
Internal consistency and
convergent validity of the
theoretical construct
measures

proper comparison between the models. Taking into account all this four criteria, Model 2 exhibits a better fit, demonstrating that forgetting the consumer personality dimension means forgetting a critical dimension to get insight on the reasons that drive individuals to use mobiles to shop online. Especially, relevant for us is the fact that the amount of variance explained of the intention to use mobiles for shopping is more than eight per cent higher when personality variables have been added (corrected $R^2 = 0.318$) than in the classical TAM model (corrected $R^2 = 0.230$).

But to gain insight on the specific way in which personality variables are influencing M-shopping intention and patronage, we need to compare the estimated model parameters for both models (Table V). The main difference emerging from the data deals with the influence of perceived usefulness on M-shopping intention. While this relationship is significant in the TAM model ($\beta = 0.164$; $p < 0.05$) it exhibits no influence when personality variables are added ($\beta = 0.061$; $p > 0.05$). This result indicates that what is a personality predisposition to use a new technology, could be interpreted as a rationally build intention based on the usefulness of that technology if these variables are omitted. The result is consistent with previous findings of Kuo and Yen (2009) that attribute it to the perception that a variety of functions in 3G mobile services was not perceived useful by customers, who viewed them as differing only in marketing approach from 2G services. Probably, if personality variables had been omitted in Kuo and Yen's (2009) paper, a significant relationship would have been found.

A similar result can be found for ease of use. If we calculate the total effects of this variable on M-shopping intention, it is significantly higher on the classical TAM ($\beta = 0.300$; $p < 0.01$) than personality variables are added ($\beta = 0.188$; $p < 0.01$). Once again perceived ease of use on the classical TAM may be hiding experience effects derived from compatibility as belonging to a technological cluster which has already used similar technology for online shopping may be doing the individual to perceive easier to use any similar technology for the same purpose. In the same way,

	1	2	3	4	5
1. Usefulness	0.64	0.43	0.16	0.34	0.46
2. Ease of use	[0.57; 0.75]	0.49	0.21	0.41	0.34
3. Affinity	[0.31; 0.50]	[0.35; 0.56]	0.55	0.08	0.17
4. Innovativeness	[0.49; 0.68]	[0.54; 0.74]	[0.18; 0.40]	0.55	0.34
5. Attitude	[0.61; 0.74]	[0.49; 0.67]	[0.31; 0.51]	[0.49; 0.67]	0.59

Table III.
Discriminant validity of the theoretical construct measures

Notes: $n = 470$; the diagonal represents the AVE, while above the diagonal the shared variance (squared correlations) is represented, below the diagonal, the 95 per cent confidence interval for the estimated factors correlations is provided

Criteria	Model 1: TAM	Model 2: TAM + personality
Model AIC	187.22	121.81
Model CAIC	− 573.48	− 1,344.54
RMSEA	0.070	0.056
R^2 (intention)	0.232	0.324
Corrected R^2 (intention)	0.230	0.318

Table IV.
Comparative model parsimony

Hypothesis	Path	Model 1: base TAM		Model 2: TAM + personality	
		Standardized path coefficients	Robust t-value	Standardized path coefficients	Robust t-value
H1	Innovativeness → M-shopping intention			0.277**	4.27
H2	Affinity → M-shopping intention			0.085*	1.96
H3	Compatibility → M-shopping intention			0.174**	4.18
H4	Ease of use → perceived usefulness	0.631**	6.97	0.711**	8.60
H5	Ease of use → attitude toward M-shopping	0.229**	2.99	0.437**	4.91
H6	Perceived usefulness → attitude toward M-shopping	0.510**	6.77	0.343**	4.15
H7	Perceived usefulness → M-shopping intention	0.164**	2.52	0.061**	0.91
H8	Attitude toward M-shopping → M-shopping intention	0.358**	6.03	0.215**	3.69
H9	M-shopping intention → M-shopping patronage	0.628**	17.96	0.624**	17.43

Notes: Model 1: S-B χ^2 (df = 148) = 483.21 ($p < 0.01$); NFI = 0.915; NNFI = 0.930; CFI = 0.939; RMSEA = 0.070; Model 2: S-B χ^2 (df = 287) = 695.81 ($p < 0.01$); NFI = 0.900; NNFI = 0.930; CFI = 0.938; RMSEA = 0.056; *$p < 0.05$; **$p < 0.01$; $n = 470$

Table V.
Structural model results

innovativeness is unlikely to be a personality variable of those people for whom technology in general and mobile in particular are not perceived as easy to use. Yang (2005) who also takes into account individual characteristics like innovativeness or technology cluster when trying to explain M-commerce adoption, indicates that ease of use might not be a good measure to predict emerging technology that consumers have heard about, but do have no first hand experience of using it. Probably, if personality variables had not been added, ease of use would have had a more relevant role in explaining behavioural intention.

Focusing on the specific effect of personality variables, our results show that although the effect of affinity is not strong ($\beta = 0.085$; $p < 0.05$), M-shopping intention is more clearly influenced by individual perceived compatibility ($\beta = 0.174$; $p < 0.01$) and degree of innovativeness ($\beta = 0.277$; $p < 0.01$). Our results also allow us to conclude that intention is in both cases a good predictor of M-shopping behaviour.

5. Discussion and conclusions

In this paper, we have tried to evaluate the relative importance of critical individual personality variables that have explicitly been removed in integrative TAMs such as UTAUT.

We have found that affinity to mobile telephones has a direct and positive influence on the intention to engage in M-shopping, agreeing with findings of previous research focused on both television (Perse, 1986) and mobile phones (Bigné et al., 2007). This result implies that the more important mobile phones are in people's lives (affinity), the higher the probability of acquiring services through mobile phones. So, companies which use the mobile phone as a shopping channel should be able to offer new, innovative services and contents with added value to improve consumers' affinity to mobile phones, as it would allow consumers to maintain a relationship with this medium and increase the probability of purchase.

Compatibility, as the degree in which mobiles are consistent to past experiences with distance shopping methods, has a positive influence on the intention to engage in M-shopping, suggesting that a consumer who has previously shopped through the internet is more likely to make a purchase via a mobile phone in the future. These findings are consistent with previous studies using the technology cluster concept (Rogers, 1995; Yang, 2005). Consumers who have purchased a product or service through the internet have broken the barriers to distance shopping and therefore are more predisposed to M-commerce (Sivanad et al., 2004). The internet then becomes the best media on which to base advertising campaigns for mobile services. Using a banner or an advergame in an e-commerce web to promote a mobile service, assures access to a segment of people with an increased probability of becoming M-shoppers, mainly because their risk perception as experienced e-consumers is much lower than that of other internet surfers.

The positive and direct influence of consumer innovativeness in M-shopping intention corroborates similar results in different technology acceptance studies (Eastlick and Lotz, 1999; Goldsmith, 2000; Limayern et al., 2000; O'Cass and Fenech, 2003). Therefore, if innovativeness proves once again to be domain-specific, theories of consumer innovativeness can be generalized to M-shopping: innovative M-shoppers will become opinion leaders for M-shopping. However, this segment of innovators becomes interesting for many reasons other than its word-of-mouth potential.

Innovators are less price-sensitive than later buyers are (Degeratu *et al.*, 2000), they are loyal shoppers and innovative online buying is associated with heavy usage (Goldsmith, 2001). The question is, once again, whether this innovator segment can be identified and reached. As this study has proved, the domain-specific innovativeness scale (Goldsmith and Hofacker, 1991) is fully operational and has good psychometric characteristics. Therefore, if the segment is identified, a positive image of the M-shopping service, along with appropriate incentives, may be presented to the consumer to encourage subsequent positive word-of-mouth.

When comparing the effects of TAM variables in its classic definition and incorporating the aforementioned personality variables, the main difference arises in the role of perceived usefulness. Contradicting the classic TAM estimation, but agreeing with Hsu and Lu (2004), our estimation with personality variables indicates that perceived usefulness does not increase users' intention to shop using mobile devices even though it has a direct affect on attitude. The rationale of this result suggests that users would buy using their mobile devices even if they found no special advantages to the system (e.g. speed and price/quality ratio). So, other drivers should be considered when developing M-shopping. Therefore, it may be reasonable to include non-utilitarian motives to explain users' intentions to use mobile services (e.g. enjoyment, expressiveness, status and relaxation).

Once again, the implications of this result for practitioners could be important. If intrinsic motivations (those derived from pleasure and inherent satisfaction) are as important as extrinsic ones, then a mobile service should not be simply designed as easy to use, but also as an enjoyable experience. Even though consumers may not expect to be entertained when they shop online, if they do enjoy their experience, they are more likely to return. Research on servicescape in a mobile commerce context, becomes an attractive future research line. As pointed out by Papadopoulou *et al.* (2001), the implementation of a virtual environment enabling the formation of trust is not a simple task, because while some aspects of the physical commercial environment have an easy-to-find counterpart in the virtual world (conventional payment vs online payment), others are more difficult to manage (preview and experience of virtual products or personalized dialogue with agents).

The result obtained when personality variables are added to classic TAM is the slightly different effect of perceived ease of use on behavioural intention. In both models, this variable has a significant effect, which has important implications for mobile shopping agents. An easy-to-use interface becomes critical to promote M-shopping. The mobile telephone is a highly extended technology, but its limited use for services other than simple functions such as voice services and text messaging (Nysveen *et al.*, 2005) can be probably explained by low-usability perceptions. To promote M-shopping among users, marketers should particularly highlight aspects relating to user friendliness and developers should ensure through usability pretesting that all services are considered sufficiently ease to use. But the effect of perceived ease of use is slightly lower when personality variables are included, which indicates that part of that perception arises from the personality of the individual. This result should make us consider on different ways of improving perceived ease of use depending on individual personality. By way of example, and on the framework of mobile human-computer interaction Kurniawan (2008) posits that for a low-compatibility cluster, such as older people, what makes an "ageing friendly" phone are topics like

better visual displays (stronger backlight and larger text) or haptic aids (rubber grips and bigger buttons), which are probably very different strategies for improving perceived ease of use than those which would be used for people with a high degree of affinity or innovativeness.

The most important limitation of this research is probably the lack of cross-national and cultural diversity in the sample as the behaviour of mobile consumers is probably influenced by the consumers' national culture. For this reason, we consider that another interesting line of research would be to contrast the validity of the proposed behavioural model with samples of consumers from other cultures and compare the results obtained.

Another limitation is the sampling technique used. Lack of randomness in the sample limits the generalizability of our findings beyond our specific sample. However, the convenience sampling technique is being used increasingly in M-commerce research (Wu and Wang, 2005; Yang, 2005).

Additionally, there are complementary aspects not included in the questionnaire which could be relevant to analyze. Despite the importance of the external variables added to the TAM model in the intention to engage in mobile shopping, we have not analyzed the antecedents of affinity to mobile phones and innovativeness. For this reason, and bearing in mind the lack of research in this field, we are considering, as a line of research, proposing and empirically testing a general model of M-shopping behaviour that includes the antecedents of these external variables.

References

Ahn, T., Ryu, S. and Han, S.I. (2004), "The impact of the online and offline features on the user acceptance of Internet shopping malls", *Electronic Commerce Research and Applications*, Vol. 3 No. 4, pp. 405-20.

Akaike, H. (1973), "Information theory and an extension of the maximum likelihood principle", in Petrov, B.N. and Csaki, F. (Eds), *Second International Symposium on Information Theory*, Academiai Kiado, Budapest, pp. 267-81.

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modelling in practice: a review and recommended two-step approach", *Psychological Bulletin*, No. 103, pp. 411-23.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.

Ball-Rokeach, S.J. (1985), "The origins of individual media-system dependency: a sociological framework", *Communication Research*, Vol. 12 No. 4, pp. 485-510.

Baron, S., Patterson, A. and Harris, K. (2006), "Beyond technology acceptance: understanding consumer practice", *International Journal of Service Industry Management*, Vol. 17 No. 2, pp. 111-35.

Bentler, P.M. (1995), *EQS Structural Equations Program Manual*, Multivariate Software, Encino, CA.

Bigné, E., Ruiz, C. and Sanz, S. (2005), "The impact of internet user shopping patterns and demographics on consumer mobile buying behaviour", *Journal of Electronic Commerce Research*, Vol. 6 No. 3, pp. 193-209.

Bigné, E., Ruiz, C. and Sanz, S. (2007), "Key drivers of mobile commerce adoption: an exploratory study of Spanish mobile users", *Journal of Theoretical and Applied Electronic Commerce Research*, Vol. 2 No. 2, pp. 48-60.

Boase, J., Horrigan, J., Wellman, B. and Rainie, L. (2006), "The strength of internet ties", Pew Internet and American Life Project, available at: www.pewinternet.org (accessed 10 November 2008).

Bozgodan, H. (1987), "Model selection and Akaike's information criterion (AIC): the general theory and its analytical extensions", *Psychometrika*, Vol. 52, pp. 345-70.

Cheong, J. and Park, C. (2005), "Mobile internet acceptance in Korea", *Internet Research*, Vol. 15 No. 2, pp. 125-40.

Chou, C., Bentler, P.M. and Satorra, A. (1991), "Scaled test statistics and robust standard errors for non-normal data in covariance structure analysis", *British Journal of Mathematical and Statistical Psychology*, No. 44, pp. 347-57.

Citrin, A., Sprott, D., Silverman, S., Steven, N. and Stern, D. (2000), "Adoption of internet shopping: the role of consumer innovativeness", *Industrial Management & Data Systems*, Vol. 100 No. 7, pp. 294-300.

Compeau, D.R., Higgins, C.A. and Huff, S. (1999), "Social cognitive theory and individual reactions to computing technology: a longitudinal study", *MIS Quarterly*, Vol. 23 No. 2, pp. 145-58.

Coursaris, C. and Hassanein, K. (2002), "Understanding M-commerce: a consumer-centric model", *Quarterly Journal of Electronic Commerce*, Vol. 3 No. 3, pp. 247-71.

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use and user acceptance of information technology", *MIS Quaterly*, Vol. 13 No. 3, pp. 319-40.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982-1002.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1992), "Extrinsic and intrinsic motivation to use computers in the workplace", *Journal of Applied Psychology*, Vol. 22 No. 14, pp. 1111-32.

Defleur, M.L. and Ball-Rokeach, S.J. (1989), *Theories of Mass Communication*, Longman, New York, NY.

Degeratu, A., Rangaswamy, A. and Wu, J. (2000), "Consumer choice behaviour in online and traditional supermarkets: the effects of brand name, price and other search attributes", *International Journal of Research in Marketing*, No. 17, pp. 55-78.

Eastin, M. (2002), "Diffusion of e-commerce: an analysis of the adoption of four e-commerce activities", *Telematics and Informatics*, No. 19, pp. 251-67.

Eastlick, M. and Lotz, S. (1999), "Profiling potential adopters and non-adopters of an interactive electronic shopping medium", *International Journal of Retail & Distribution Management*, Vol. 27 No. 6, pp. 209-23.

Fenech, T. (1998), "Using perceived ease of use and perceived usefulness to predict acceptance of the world wide web", *Computer Network and ISDN Systems*, No. 30, pp. 629-30.

Fishbein, M. and Ajzden, I. (1975), *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, No. 18, pp. 39-50.

Gatignon, H. and Roberts, T.S. (1985), "A propositional inventory for new diffusion research", *Journal of Consumer Research*, No. 11, pp. 849-67.

Gefen, D. and Straub, D. (1997), "Gender differences in the perception and use of email: an extension to the technology acceptance model", *MIS Quaterly*, Vol. 21 No. 4, pp. 389-400.

Goldsmith, R.E. (2000), "Identifying wine innovators: a test of the domain-specific innovativeness scale using known groups", *International Journal of Wine Marketing*, Vol. 12 No. 2, pp. 37-46.

Goldsmith, R.E. (2001), "Using the domain-specific innovativeness scale to identify innovative internet consumers", *Internet Research*, Vol. 11 No. 2, pp. 149-58.

Goldsmith, R.E. (2002), "Explaining and predicting consumer intention to purchase over the internet: an exploratory study", *Journal of Marketing*, No. 66, pp. 22-8.

Goldsmith, R.E. and Hofacker, C.F. (1991), "Measuring consumer innovativeness", *Journal of the Academy of Marketing Science*, Vol. 19 No. 3, pp. 209-21.

Goldsmith, R.E., Eastman, J.K. and Freiden, J. (1995), "The generality/specificity issue in consumer innovativeness research", *Technovation*, Vol. 15 No. 10, pp. 601-12.

Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998), *Multivariate Data Analysis*, 5th ed., Prentice-Hall, Englewood Cliffs, NJ.

Hatcher, L. (1994), *A Step-by-step Approach to Using the SAS System for Factor Analysis and Structural Equation Modelling*, SAS Institute, Cary, NC.

Hirschman, E. (1980), "Innovativeness, novelty seeking and consumer creativity", *Journal of Consumer Research*, Vol. 7 No. 3, pp. 283-95.

Hsu, C.-L. and Lu, H.-P. (2004), "Why do people play on-line games? An extended TAM with social influences and flow experience", *Information and Management*, Vol. 41 No. 7, pp. 853-68.

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling*, Vol. 6 No. 1, pp. 1-55.

Hu, L.T., Bentler, P.M. and Kano, Y. (1992), "Can test statistics in covariance structure analysis be trusted?", *Psychological Bulletin*, No. 112, pp. 351-62.

Joseph, B. and Vyas, S.J. (1984), "Concurrent validity of a measure of innovative cognitive style", *Journal of the Academy of Marketing Sciences*, Vol. 12 No. 2, pp. 159-75.

Katz, E., Blumler, J.G. and Gurevitch, M. (1974), "Utilization of mass communication by the individual", in Blumler, J.G. and Katz, E. (Eds), *The Uses of Mass Communications: Current Perspectives on Gratifications Research*, Sage, Beverly Hills, CA, pp. 19-32.

Kleijnen, M., de Ruyter, K. and Wetzels, M. (2007), "An assesment of value creation in mobile service delivery and the moderating role of time consciousness", *Journal of Retailing*, Vol. 83 No. 1, pp. 33-46.

Korgaonkar, P. and Moschis, G. (1987), "Consumer adoption of videotext services", *Journal of Direct Marketing*, Vol. 1 No. 4, pp. 63-71.

Kuo, Y. and Yen, S. (2009), "Towards an understanding of the behavioral intention to use 3G mobile value-added services", *Computers in Human Behavior*, Vol. 25, pp. 103-10.

Kurniawan, S. (2008), "Older people and mobile phones: a multi-method investigation", *International Journal of Human-Computer Studies*, Vol. 66, pp. 889-901.

Larose, R. and Atkin, D. (1992), "Audio text and the reinvention of the telephone as mass medium", *Journalism Quarterly*, No. 69, pp. 413-21.

Lee, Y.-C. (2006), "An empirical investigation into factors influencing the adoption of an e-learning system", *Online Information Review*, Vol. 30 No. 5, pp. 517-41.

Limayern, M., Khalifa, M. and Frini, A. (2000), "What makes consumers shop via Internet? A longitudinal study of online shopping", *IEEE Transactions on Systems, Man and Cybernetics, Part A: Systems and Humans*, Vol. 30 No. 4, pp. 421-32.

Lu, J., Yu, C., Liu, C. and Yao, J. (2003), "The technology acceptance model for wireless internet", *Internet Research*, Vol. 13 No. 3, pp. 206-22.

Luarn, P. and Lin, H.H. (2005), "Toward an understanding of the behavioural intention to use mobile banking", *Computers in Human Behaviour*, No. 21, pp. 873-91.

Netsize (2008), *The Netsize Guide 2008, Mobile 2.0, You are in Control*, available at: www.netsize. com (accessed 12 July 2008).

Nunnally, J. and Bernstein, I.H. (1994), *Psychometric Theory*, 3rd ed., McGraw-Hill, New York, NY.

Nysveen, H., Pedersen, P.E. and Thorbjørnsen, H. (2005), "Intentions to use mobile services: antecedents and cross-service comparison", *Journal of the Academy of Marketing Science*, Vol. 33 No. 3, pp. 330-46.

O'Cass, A. and Fenech, T. (2003), "Web retailing adoption: exploring the nature of internet users' web retailing adoption", *Journal of Retailing and Consumer Services*, Vol. 10 No. 2, pp. 81-94.

Papadopoulou, P., Andreou, A., Kanellis, P. and Martakos, D. (2001), "Trust and relationship building in electronic commerce", *Internet Research*, Vol. 11 No. 4, pp. 322-32.

Perse, E.M. (1986), "Soap opera viewing patterns of college students and cultivation", *Journal of Broadcasting and Electronic Media*, Vol. 30 No. 2, pp. 175-93.

Rice, R.E. and Katz, J.E. (2003), "Comparing internet and mobile phone usage: digital divides of usage, adoption and dropouts", *Telecommunications Policy*, Vol. 27 Nos 8/9, pp. 597-623.

Rogers, E. (1995), *Diffusion of Innovations*, 4th ed., The Free Press, New York, NY.

Rubin, A.M. (1981), "An examination of television viewing motivations", *Communications Research*, No. 8, pp. 141-65.

Rubin, A.M. and Perse, E.M. (1988), "Audience activity and soap opera involvement", *Human Communication Research*, Vol. 14 No. 2, pp. 246-68.

Ruiz, C. and Sanz, S. (2006), "Explaining Internet dependency. an exploratory study of future purchase intention of Spanish internet users", *Internet Research*, Vol. 16 No. 4, pp. 380-97.

Satorra, A. and Bentler, P.M. (1988), "Scaling corrections for chi square statistics in covariance structure analysis", *American Statistical Associations Proceedings of the Business and Economic Sections, American Statistical Association, Alexandria, VA*, pp. 308-13.

Shim, S. and Drake, M. (1990), "Consumer intention to utilize electronic shopping", *Journal of Direct Marketing*, No. 4, pp. 22-33.

Sivanad, C., Gesta, M. and Sulep, M. (2004), "Barriers to mobile internet banking services adoption: an empirical study in Klang Valley of Malaysia", *Internet Business Review*, No. 1, pp. 1-17.

Sooryamoorthy, B., Miller, P. and Shrum, W. (2008), "Untangling the technology cluster: mobile telephony, internet use and the social ties", *New Media Society*, Vol. 10 No. 5, pp. 729-49.

Thompson, R.L., Higgins, C.A. and Howell, J.M. (1991), "Influence of experience on personal computer utilization: toward a conceptual model of utilization", *MIS Quarterly*, Vol. 15 No. 1, pp. 124-43.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, pp. 425-78.

Wu, J.H. and Wang, S.C. (2005), "What drives mobile commerce? An empirical evaluation of the revised technology acceptance model", *Information & Management*, Vol. 42 No. 5, pp. 719-29.

Yang, K.C. (2005), "Exploring factors affecting the adoption of mobile commerce in Singapore", *Telematics and Informatics*, Vol. 22 No. 3, pp. 257-77.

Zaichkowsky, J.L. (1994), "The personal involvement inventory: reduction, revision, and application to advertising", *Journal of Advertising*, No. 23, pp. 56-9.

756

Appendix

Concept	Items	Source
Attitude to mobile shopping (five-point Likert scale)	1. Mobile shopping is appealing 2. Mobile shopping is convenient 3. Mobile shopping is involving 4. Mobile shopping is fascinating 5. Mobile shopping is interesting 6. Mobile shopping is valuable 7. Mobile shopping is exciting 8. Mobile shopping is secure 9. Mobile shopping is needed 10. Mobile shopping is a good idea	Adapted from Zaichkowsky (1994), Goldsmith (2002) and O'Cass and Fenech (2003)
Perceived usefulness (five-point Likert scale)	1. Using M-shopping would enable me to accomplish shopping tasks faster 2. Using M-shopping can help me to make better purchasing decisions 3. Using M-shopping will improve the performance of my purchases 4. Using M-shopping will help me to save money 5. Using M-shopping improves the quality of my shopping tasks 6. Using M-shopping increases the productivity of my shopping tasks	Adapted from Davis (1989), Ahn *et al.* (2004) and Wu and Wang (2005)
Perceived ease of use (five-point Likert scale)	1. I think that I would find it easy to learn how to shop using a mobile phone 2. I think that I am able to shop using a mobile phone without the help of an expert 3. I think that my mobile phone is flexible to interact with when shopping 4. I think that I could become skilful at M-shopping 5. I think that M-shopping online does not requires great mental effort 6. I think that it is easy to use a mobile phone to find services that I would buy	Adapted from Davis (1989), Ahn *et al.* (2004) and Wu and Wang (2005)
Innovativeness (five-point Likert scale)	1. I think I would be the first in my circle of friends to know where I can shop using a mobile phone 2. I think I would be the first in my circle of friends to shop using a mobile phone	Adapted from Goldsmith and Hofacker (1991)

Table AI.
Scale items

(*continued*)

Concept	Items	Source
	3. I think I know more about M-shopping than my circle of friends	
	4. I think I would shop using a mobile phone even if I did not know anyone who had done it before	
Affinity to mobile phones (five-point Likert scale)	1. Using a mobile phone is one of my main daily activities	Adapted from Perse (1986), Ruiz and Sanz (2006) and Bigné *et al.* (2007)
	2. If my mobile phone is down, I really miss it	
	3. My mobile phone is important in my life	
	4. I cannot go for several days without using a mobile phone	
	5. I would be lost without my mobile phone	
Compatibility indicated by distance shopping experience (Have you ever purchased online?)	Yes/no	Bigné *et al.* (2005)
M-shopping patronage (Have you ever shopped using a mobile phone?)	Yes/no	Bigné *et al.* (2005)
M-shopping intention (Would you buy a service using a mobile phone in the next year?)	1. Yes, definitely	Adapted from Goldsmith (2002)
	2. Yes, probably	
	3. Indifferent	
	4. Probably not	
	5. No, definitely not	

Table AI.

Corresponding author
Carla Ruiz-Mafé can be contacted at: carla.ruiz@uv.es

This article has been cited by:

1. Qian Cao, Xiaofei Niu. 2019. Integrating context-awareness and UTAUT to explain Alipay user adoption. *International Journal of Industrial Ergonomics* **69**, 9-13. [Crossref]

2. Ana Mosquera, Emma Juaneda-Ayensa, Cristina Olarte-Pascual, Jorge Pelegrín-Borondo. 2018. Key Factors for In-Store Smartphone Use in an Omnichannel Experience: Millennials vs. Nonmillennials. *Complexity* **2018**, 1-14. [Crossref]

3. Michael Groß. 2018. Mobile shopping loyalty: The salient moderating role of normative and functional compatibility beliefs. *Technology in Society* **55**, 146-159. [Crossref]

4. Iviane Ramos de Luna, Francisco Liébana-Cabanillas, Juan Sánchez-Fernández, Francisco Muñoz-Leiva. 2018. Mobile payment is not all the same: The adoption of mobile payment systems depending on the technology applied. *Technological Forecasting and Social Change* . [Crossref]

5. GhazaliEzlika M., Ezlika M. Ghazali, MutumDilip S., Dilip S. Mutum, ChongJiu Hui, Jiu Hui Chong, NguyenBang, Bang Nguyen. 2018. Do consumers want mobile commerce? A closer look at M-shopping and technology adoption in Malaysia. *Asia Pacific Journal of Marketing and Logistics* **30**:4, 1064-1086. [Abstract] [Full Text] [PDF]

6. Xueqin Wang, Kum Fai Yuen, Yiik Diew Wong, Chee-Chong Teo. 2018. E-consumer adoption of innovative last-mile logistics services: A comparison of behavioural models. *Total Quality Management & Business Excellence* **28**, 1-27. [Crossref]

7. Fang Xu, Jia Tina Du. 2018. Factors influencing users' satisfaction and loyalty to digital libraries in Chinese universities. *Computers in Human Behavior* **83**, 64-72. [Crossref]

8. Michael D. Williams. 2018. Social commerce and the mobile platform: Payment and security perceptions of potential users. *Computers in Human Behavior* . [Crossref]

9. Chien-wen Shen, Jung-tsung Ho, Pham Thi Minh Ly, Ting-chang Kuo. 2018. Behavioural intentions of using virtual reality in learning: perspectives of acceptance of information technology and learning style. *Virtual Reality* **26**. . [Crossref]

10. Thamaraiselvan Natarajan, Senthil Arasu Balasubramanian, Dharun Lingam Kasilingam. 2018. The moderating role of device type and age of users on the intention to use mobile shopping applications. *Technology in Society* **53**, 79-90. [Crossref]

11. Samira Farivar, Ofir Turel, Yufei Yuan. 2018. Skewing users' rational risk considerations in Social Commerce: An empirical examination of the role of social identification. *Information & Management* . [Crossref]

12. Hannah R. Marriott, Michael D. Williams. 2018. Exploring consumers perceived risk and trust for mobile shopping: A theoretical framework and empirical study. *Journal of Retailing and Consumer Services* **42**, 133-146. [Crossref]

13. José Martí-Parreño, Amparo Galbis-Córdova, María José Miquel-Romero. 2018. Students' attitude towards the use of educational video games to develop competencies. *Computers in Human Behavior* **81**, 366-377. [Crossref]

14. Francisco Liébana-Cabanillas, Francisco Muñoz-Leiva, J. Sánchez-Fernández. 2018. A global approach to the analysis of user behavior in mobile payment systems in the new electronic environment. *Service Business* **12**:1, 25-64. [Crossref]

15. MadanKhushbu, Khushbu Madan, YadavRajan, Rajan Yadav. 2018. Understanding and predicting antecedents of mobile shopping adoption. *Asia Pacific Journal of Marketing and Logistics* **30**:1, 139-162. [Abstract] [Full Text] [PDF]

16. Massoud Moslehpour, Ha Le Thi Thanh, Pham Van Kien. Technology Perception, Personality Traits and Online Purchase Intention of Taiwanese Consumers 392-407. [Crossref]

17. Massoud Moslehpour, Van Pham, Wing-Keung Wong, İsmail Bilgiçli. 2018. e-Purchase Intention of Taiwanese Consumers: Sustainable Mediation of Perceived Usefulness and Perceived Ease of Use. *Sustainability* **10**:1, 234. [Crossref]

18. Michael Groß. 2018. Heterogeneity in consumers' mobile shopping acceptance: A finite mixture partial least squares modelling approach for exploring and characterising different shopper segments. *Journal of Retailing and Consumer Services* **40**, 8-18. [Crossref]

19. et al. Alshammari. 2017. User acceptance towards optical character recognition for international call Apps: Comparing the accuracy of the prediction by neural networks and SPSS equation. *International Journal of ADVANCED AND APPLIED SCIENCES* **4**:11, 35-42. [Crossref]

20. OzturkAhmet Bulent, Ahmet Bulent Ozturk, BilgihanAnil, Anil Bilgihan, Salehi-EsfahaniSaba, Saba Salehi-Esfahani, HuaNan, Nan Hua. 2017. Understanding the mobile payment technology acceptance based on valence theory. *International Journal of Contemporary Hospitality Management* **29**:8, 2027-2049. [Abstract] [Full Text] [PDF]

21. LeongLai-Ying, Lai-Ying Leong, JaafarNoor Ismawati, Noor Ismawati Jaafar, SulaimanAinin, Ainin Sulaiman. 2017. Understanding impulse purchase in Facebook commerce: does Big Five matter?. *Internet Research* **27**:4, 786-818. [Abstract] [Full Text] [PDF]

22. Thamaraiselvan Natarajan, Senthil Arasu Balasubramanian, Dharun Lingam Kasilingam. 2017. Understanding the intention to use mobile shopping applications and its influence on price sensitivity. *Journal of Retailing and Consumer Services* **37**, 8-22. [Crossref]

23. MarriottHannah R., Hannah R. Marriott, WilliamsMichael D., Michael D. Williams, DwivediYogesh K., Yogesh K. Dwivedi. 2017. What do we know about consumer m-shopping behaviour?. *International Journal of Retail & Distribution Management* **45**:6, 568-586. [Abstract] [Full Text] [PDF]

24. Anil Gupta, Neelika Arora. 2017. Understanding determinants and barriers of mobile shopping adoption using behavioral reasoning theory. *Journal of Retailing and Consumer Services* **36**, 1-7. [Crossref]

25. Francisco Liébana-Cabanillas, Veljko Marinković, Zoran Kalinić. 2017. A SEM-neural network approach for predicting antecedents of m-commerce acceptance. *International Journal of Information Management* **37**:2, 14-24. [Crossref]

26. Marco Hubert, Markus Blut, Christian Brock, Christof Backhaus, Tim Eberhardt. 2017. Acceptance of Smartphone-Based Mobile Shopping: Mobile Benefits, Customer Characteristics, Perceived Risks, and the Impact of Application Context. *Psychology & Marketing* **34**:2, 175-194. [Crossref]

27. Jalayer Khalilzadeh, Ahmet Bulent Ozturk, Anil Bilgihan. 2017. Security-related factors in extended UTAUT model for NFC based Mobile Payment in the Restaurant Industry. *Computers in Human Behavior* . [Crossref]

28. Hsin Hsin Chang, Chen Su Fu, Hsiou Ting Jain. 2016. Modifying UTAUT and innovation diffusion theory to reveal online shopping behavior. *Information Development* **32**:5, 1757-1773. [Crossref]

29. Xianjin Zha, Jinchao Zhang, Li Li, Haijuan Yang. 2016. Exploring the adoption of digital libraries in the mobile context. *Information Development* **32**:4, 1155-1167. [Crossref]

30. Zoran Kalinic, Veljko Marinkovic. 2016. Determinants of users' intention to adopt m-commerce: an empirical analysis. *Information Systems and e-Business Management* **14**:2, 367-387. [Crossref]

31. Sheau-Fen Yap, Sanjaya Singh Gaur. 2016. Integrating functional, social, and psychological determinants to explain online social networking usage. *Behaviour & Information Technology* **35**:3, 166-183. [Crossref]

32. Shuiqing Yang. 2016. Role of transfer-based and performance-based cues on initial trust in mobile shopping services: a cross-environment perspective. *Information Systems and e-Business Management* **14**:1, 47-70. [Crossref]

33. Abdullah Baabdullah, Omar Nasseef, Ali Alalwan. Consumer Adoption of Mobile Government in the Kingdom of Saudi Arabia: The Role of Usefulness, Ease of Use, Perceived Risk and Innovativeness 267-279. [Crossref]

34. Hannah R. Marriott, Michael D. Williams. Developing a Theoretical Model to Examine Consumer Acceptance Behavior of Mobile Shopping 261-266. [Crossref]

35. Changsu Kim, Wen Li, Dan J. Kim. 2015. An Empirical Analysis of Factors Influencing M-Shopping Use. *International Journal of Human-Computer Interaction* **31**:12, 974-994. [Crossref]

36. Boris Ovčjak, Marjan Heričko, Gregor Polančič. 2015. Factors impacting the acceptance of mobile data services – A systematic literature review. *Computers in Human Behavior* **53**, 24-47. [Crossref]

37. Chun-Hua Hsiao, Kai-Yu Tang, John S. Liu. 2015. Citation-based analysis of literature: a case study of technology acceptance research. *Scientometrics* **105**:2, 1091-1110. [Crossref]

38. Philipp A. Rauschnabel, Alexander Brem, Bjoern S. Ivens. 2015. Who will buy smart glasses? Empirical results of two pre-market-entry studies on the role of personality in individual awareness and intended adoption of Google Glass wearables. *Computers in Human Behavior* **49**, 635-647. [Crossref]

39. Tun-Min (Catherine) Jai, Tracie (Tsun-Yin) Tung. 2015. Fashion innovativeness, information technology innovativeness, and prior experience as factors influencing adoption of apparel mobile E-catalogs. *Journal of Global Fashion Marketing* **6**:3, 163-179. [Crossref]

40. Tim Barnett, Allison W Pearson, Rodney Pearson, Franz W Kellermanns. 2015. Five-factor model personality traits as predictors of perceived and actual usage of technology. *European Journal of Information Systems* **24**:4, 374-390. [Crossref]

41. Michael Groß. 2015. Exploring the acceptance of technology for mobile shopping: an empirical investigation among Smartphone users. *The International Review of Retail, Distribution and Consumer Research* **25**:3, 215-235. [Crossref]

42. Michael Groß. 2015. Mobile shopping: a classification framework and literature review. *International Journal of Retail & Distribution Management* **43**:3, 221-241. [Abstract] [Full Text] [PDF]

43. Habibullah Khan, Faisal Talib, Mohd. Nishat Faisal. 2015. An analysis of the barriers to the proliferation of M-commerce in Qatar. *Journal of Systems and Information Technology* **17**:1, 54-81. [Abstract] [Full Text] [PDF]

44. Liebana-Cabanillas Francisco, Muñoz-Leiva Francisco, Sanchez-Fernandez Juan. 2015. Payment Systems in New Electronic Environments: Consumer Behavior in Payment Systems via SMS. *International Journal of Information Technology & Decision Making* **14**:02, 421-449. [Crossref]

45. Xianjin Zha, Jinchao Zhang, Yalan Yan, Zhiliang Xiao. 2015. Does affinity matter? Slow effects of e-quality on information seeking in virtual communities. *Library & Information Science Research* **37**:1, 68-76. [Crossref]

46. Elif Ozkaya, H Erkan Ozkaya, Juanita Roxas, Frank Bryant, Debbora Whitson. 2015. Factors affecting consumer usage of QR codes. *Journal of Direct, Data and Digital Marketing Practice* **16**:3, 209-224. [Crossref]

47. John Ingham, Jean Cadieux, Abdelouahab Mekki Berrada. 2015. e-Shopping acceptance: A qualitative and meta-analytic review. *Information & Management* **52**:1, 44-60. [Crossref]

48. Abdullah Baabdullah, Yogesh Dwivedi, Michael Williams, Prabhat Kumar. Understanding the Adoption of Mobile Internet in the Saudi Arabian Context: Results from a Descriptive Analysis 95-106. [Crossref]

49. Roger Ström, Martin Vendel, John Bredican. 2014. Mobile marketing: A literature review on its value for consumers and retailers. *Journal of Retailing and Consumer Services* **21**:6, 1001-1012. [Crossref]

50. Jia-Jia Sim, Garry Wei-Han Tan, Jessica C.J. Wong, Keng-Boon Ooi, Teck-Soon Hew. 2014. Understanding and predicting the motivators of mobile music acceptance – A multi-stage MRA-artificial neural network approach. *Telematics and Informatics* **31**:4, 569-584. [Crossref]

51. Stefanie Sohn. 2014. Warum Smartphone-Nutzer nicht mobil einkaufen. *Marketing Review St. Gallen* **31**:5, 32-41. [Crossref]

52. Shuiqing Yang, Yan Wang, June Wei. 2014. Integration and consistency between web and mobile services. *Industrial Management & Data Systems* **114**:8, 1246-1269. [Abstract] [Full Text] [PDF]

53. Xianjin Zha, Jinchao Zhang, Yalan Yan, Zhiliang Xiao. 2014. User perceptions of e-quality of and affinity with virtual communities: The effect of individual differences. *Computers in Human Behavior* **38**, 185-195. [Crossref]

54. ###, ###. 2014. Characteristics Influencing Intention to Reuse Mobile Commerce. *The Journal of International Trade & Commerce* **10**:4, 637-653. [Crossref]

55. Ju-Young M. Kang, Kim K.P. Johnson, Juanjuan Wu. 2014. Consumer style inventory and intent to social shop online for apparel using social networking sites. *Journal of Fashion Marketing and Management: An International Journal* **18**:3, 301-320. [Abstract] [Full Text] [PDF]

56. Carla Ruiz-Mafé, Silvia Sanz-Blas, José Martí-Parreño. 2014. The Role of Individual-Media Relationship and Consumer Personal Factors on Spanish Teenagers' Mobile Social Networking Sites Usage. *International Journal of E-Services and Mobile Applications* **6**:3, 18-33. [Crossref]

57. Chia-Lin Hsu, Chih-Ching Yu, Cou-Chen Wu. 2014. Exploring the continuance intention of social networking websites: an empirical research. *Information Systems and e-Business Management* **12**:2, 139-163. [Crossref]

58. Sheau Fen Crystal Yap, Christina Kwai Choi Lee. 2014. Leveraging the power of online social networks: a contingency approach. *Marketing Intelligence & Planning* **32**:3, 345-374. [Abstract] [Full Text] [PDF]

59. Lu June. 2014. Are personal innovativeness and social influence critical to continue with mobile commerce?. *Internet Research* **24**:2, 134-159. [Abstract] [Full Text] [PDF]

60. Payam Hanafizadeh, Mehdi Behboudi, Amir Abedini Koshksaray, Marziyeh Jalilvand Shirkhani Tabar. 2014. Mobile-banking adoption by Iranian bank clients. *Telematics and Informatics* **31**:1, 62-78. [Crossref]

61. Xianjin Zha, Zhiliang Xiao, Jinchao Zhang. 2014. A Survey of User Perceptions of Digital Library E-Quality and Affinity. *Serials Review* **40**:1, 3-11. [Crossref]

62. Alastair Holmes, Angela Byrne, Jennifer Rowley. 2013. Mobile shopping behaviour: insights into attitudes, shopping process involvement and location. *International Journal of Retail & Distribution Management* **42**:1, 25-39. [Abstract] [Full Text] [PDF]

63. Sonia San-Martín, Blanca López-Catalán, María A. Ramón-Jerónimo. 2013. Mobile Shoppers: Types, Drivers, and Impediments. *Journal of Organizational Computing and Electronic Commerce* **23**:4, 350-371. [Crossref]

64. Jay Sang Ryu, Kenneth Murdock. 2013. Consumer acceptance of mobile marketing communications using the QR code. *Journal of Direct, Data and Digital Marketing Practice* **15**:2, 111-124. [Crossref]

65. Yung-Hsiang Cheng, Ting-Yu Huang. 2013. High speed rail passengers' mobile ticketing adoption. *Transportation Research Part C: Emerging Technologies* **30**, 143-160. [Crossref]

66. Lee Myung Moo, Yunho Kim. 2013. A Study of Use Intention of Decision Factors in Smart Phone. *Journal of Distribution and Management Research* **16**:1, 67-78. [Crossref]

67. Victoria Magrath, Helen McCormick. 2013. Marketing design elements of mobile fashion retail apps. *Journal of Fashion Marketing and Management: An International Journal* **17**:1, 115-134. [Abstract] [Full Text] [PDF]

68. Tao Zhou. 2013. An empirical examination of the determinants of mobile purchase. *Personal and Ubiquitous Computing* **17**:1, 187-195. [Crossref]

69. Cayetano Medina Molina, Ramón Rufin Moreno, Manuel Rey Moreno. 2013. La adopción del e-Gobierno en entornos voluntarios. *Investigaciones Europeas de Dirección y Economía de la Empresa* **19**:1, 42-52. [Crossref]

70. Lisa Y. Chen. Marketer Perceptions of Quality on the Success of Mobile Shopping System and Its Impact on Performance 29-33. [Crossref]

71. Theodora Zarmpou, Vaggelis Saprikis, Angelos Markos, Maro Vlachopoulou. 2012. Modeling users' acceptance of mobile services. *Electronic Commerce Research* **12**:2, 225-248. [Crossref]

72. Min Li, Z.Y. Dong, Xi Chen. 2012. Factors influencing consumption experience of mobile commerce. *Internet Research* **22**:2, 120-141. [Abstract] [Full Text] [PDF]

73. Kyu-Seek Sohn. 2012. An Empirical Study of Factors Influencing Intention to Use Smartphone Applications. *Journal of the Korea Academia-Industrial cooperation Society* **13**:2, 628-635. [Crossref]

74. Afzaal H. Seyal, Mahbubur Rahim, Rodney Turner. 2011. Understanding the Behavioral Determinants of M-Banking Adoption. *Journal of Electronic Commerce in Organizations* **9**:4, 22-47. [Crossref]

75. Muhammad Z. I. Lallmahomed, Nor Zairah Ab Rahim, Roliana Ibrahim, Azizah Abdul Rahman. 2011. A Preliminary Classification of Usage Measures in Information System Acceptance. *International Journal of Technology Diffusion* **2**:4, 25-47. [Crossref]

76. Ge Wei, Zhao Xinyan, Ma Yue. Literature review on consumer adoption behavior of mobile commerce services 1-5. [Crossref]

77. Theodora Zarmpou, Vaggelis Saprikis, Maro Vlachopoulou. 2011. Examining Behavioral Intention Toward Mobile Services. *International Journal of E-Services and Mobile Applications* **3**:2, 1-19. [Crossref]

78. Tao Zhou. 2011. An empirical examination of users' post-adoption behaviour of mobile services. *Behaviour & Information Technology* **30**:2, 241-250. [Crossref]

79. Zohra Saleem, Kashif Rashid. 2011. Relationship between Customer Satisfaction and Mobile Banking Adoption in Pakistan. *International Journal of Trade, Economics and Finance* 537-543. [Crossref]

80. Susanne J B Niklas, Stefan Strohmeier. Exploring the Impact of Usefulness and Enjoyment on Mobile Service Acceptance: A Comparative Study 1-10. [Crossref]

81. Nicole Koenig-Lewis, Adrian Palmer, Alexander Moll. 2010. Predicting young consumers' take up of mobile banking services. *International Journal of Bank Marketing* **28**:5, 410-432. [Abstract] [Full Text] [PDF]

82. Tao Zhou, Yaobin Lu, Bin Wang. 2010. Integrating TTF and UTAUT to explain mobile banking user adoption. *Computers in Human Behavior* **26**:4, 760-767. [Crossref]

83. DonHee Lee, Sang M. Lee, David L. Olson, Soong Hwan Chung. 2010. The effect of organizational support on ERP implementation. *Industrial Management & Data Systems* **110**:2, 269-283. [Abstract] [Full Text] [PDF]

84. Shih-Chih Chen, Huei-Huang Chen, Mei-Fang Chen. 2009. Determinants of satisfaction and continuance intention towards self-service technologies. *Industrial Management & Data Systems* **109**:9, 1248-1263. [Abstract] [Full Text] [PDF]

85. Theodora Zarmpou, Vaggelis Saprikis, Maro Vlachopoulou. Examining Behavioral Intention Toward Mobile Services 37-56. [Crossref]

86. Geetika Jain, Sapna Rakesh. Understand the Frequency of Application Usage by Smartphone Users 291-303. [Crossref]

87. Vaggelis Saprikis, Maro Vlachopoulou, Theodora Zarmpou. Mobile Services Behavioral Intention 1341-1364. [Crossref]

88. Muhammad Z. I. Lallmahomed, Nor Zairah Ab Rahim, Roliana Ibrahim, Azizah Abdul Rahman. A Preliminary Classification of Usage Measures in Information System Acceptance 105-129. [Crossref]

89. Zakariya Belkhamza, Mohd Adzwin Faris Niasin, Sidah Idris. The Effect of Privacy Concerns on the Purchasing Behavior Among Malaysian Smartphone Users 1383-1399. [Crossref]

90. Afzaal H. Seyal, Mahbubur Rahim, Rodney Turner. Understanding the Behavioral Determinants of M-Banking Adoption 225-251. [Crossref]

91. Garry Wei-Han Tan, Voon-Hsien Lee, Choy-Har Wong, Keng-Boon Ooi. Mobile Shopping: 1448-1460. [Crossref]

92. Saïd Aboubaker Ettis, Afef Ben Zin El Abidine. Consumer Behavior in M-Commerce 264-287. [Crossref]

93. Yi Cai, Brenda J. Cude. Consumers' Adoption of Online Shopping 466-476. [Crossref]

94. Vaggelis Saprikis, Maro Vlachopoulou, Theodora Zarmpou. Mobile Services Behavioral Intention 24-47. [Crossref]

95. Zakariya Belkhamza, Mohd Adzwin Faris Niasin. Privacy Concerns and Smartphone App Purchase Behavior in Malaysia 233-247. [Crossref]