INTERNAL AND EXTERNAL DEVELOPERS OF MOBILE PHONE ATTACHMENT AND SHOPPING.

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Mobile devices have become one of the most personal tools that individuals have. In fact, they can be considered an integral part of their daily routine to the extent of feeling attachment to them. In this point, following the Stimulus-Organism-Response model (SOR), this paper attempts to analyze how certain consumer internal factors (addiction to mobile phones and perceived control) and external ones (perceived entertainment and subjective norms) influence their attachment to their mobile device and finally their intention purchase with it.To this end, information was collected from a sample of 220 online travel buyers and structural equation modeling was used in the analysis of the causal model.Results show the importance of internal and external factors in increasing attachment to the mobile device and how this attachment -conceptualized as an attitudinal second order constructcomprising identity, dependence and social ties to the mobile phone-, positively influences the intention of mobile shopping. This work is innovative as it analyses attachment to the mobile phone and mobile shopping intentions in the travel sector, contributing in this way both to the academic literature and business practice.

Keywords: Mobile phone attachment, S-O-R model, consumer behavior, mobile commerce, travel.

1. Introduction

Mobile devices are considered essentially personal and are objects that individuals carry with them throughout all the day, becoming sometimes an artificial extension of the body (Wehmeyer, 2007). These devices have become so essential, private and non-transferable, that users consider them as an indispensable part of themselves to the point that many would feel lost without them (Kolsaker and Drakatos, 2009; Shankar *et al*., 2016). In this sense, even emotional terms have been used to describe situations referring to them as "We often have panic situations when the battery runs down" or "I love it because we are not restricted" (Vincent *et al*., 2005).

In a situation like this, it is not surprising that individuals begin to develop attachment to their mobile devices (Wehmeyer, 2007). The concept of attachment, based on the Attachment Theory (Bowlby, 1960), was developed in psychology to explain the relationships among individuals. Beyond this context, it has been applied in marketing research to analyze the link between consumers and products (Ball and Tasaki, 1992) and physical sites (places) (Kyle *et al*., 2005) and to explain B2C relations(Mälar *et al*., 2011; Vlachos *et al*., 2010). More recently, an interesting contribution has been done through its application to the field of new technologies (Choi, 2013, 2015; Lin, 2015) and more specifically linking consumers with mobile devices (Wu *et al*., 2016. Wehmeyer, 2007). In this sense, mobile phone attachment (MPA)is defined as the relationship between individuals and their mobile phones that has been appropriated, and singularized through person-phone interaction (Abouzahra *et al*., 2014). The literature in this context has focused on the one hand, on introducing the concept (Wehmeyer, 2007) and, on the other hand, on analyzing its impact on different aspects such as the future adoption of new mobile phone services (Vincent *et al*., 2005), receptivity to mobile advertising (Kolsaker and Dakatos, 2009), the attitude toward mobile marketing (Rohm *et al*., 2012), and more recently, the active use of SMS (Wu *et al*., 2016). However, the impact of MPA on purchase intentions through mobile devices is still an unexplored area in the academic literature.

Given this situation, this paper attempts to fill this gap and to analyze the impact of MPA on consumer intention to buy with a mobile device. More specifically, the objective is to find out how MPA, influenced by consumer internal and external factors, affects the intention to purchase a travel via mobile phone.

In this paper MPA conceptualization follows the study by Kyle *et al*. (2005), which include an affective dimension (identity), a cognitive dimension (dependence) and finally a practice or conative dimension (social bond). If applied to mobile contexts, identity describes the point of emotional connection between the mobile site and the consumer and personality in relation to the shopping environment (Williams and Roggenbuck., 1989; Williams and Vaske, 2003; Kyle *et al*., 2005). Dependenceon the mobile site refers to the cognitive point of the attachment model and reflects the functional value that the consumer gives to the characteristics and conditions of the mobile site which support the goals or desired activities (Williams and Roggenbuck, 1989; Williams and Vaske, 2003; Kyle *et al*., 2005). Finally, social bonding includes the activity and action that the consumer shows and is based on the incorporation of other groups of people, such as family and friends, community and even culture (Kyle *et al*., 2005).

2. Research hypotheses: S-O-R model

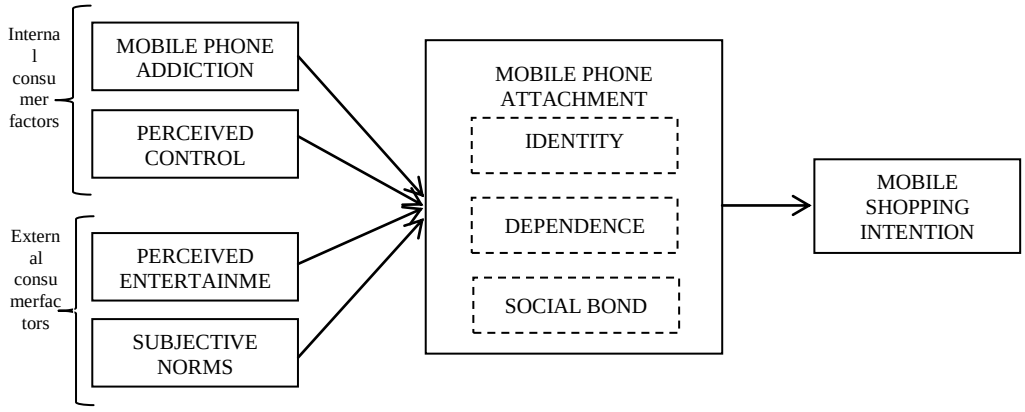
The Stimulus-Organism-Response (S-O-R) model of Mehrabian and Russell (1974), derived from environmental psychology, suggests that the stimuli that the buyer perceives can

generate attitudes and emotions that lead to an answer. When applied to mobile purchase of travel contexts, this model allows us to incorporate stimuli (S), which are related to the environment and consumer purchase; organism (O), which presents the affective and cognitive reactions that the consumer develops when perceiving stimuli, and consumer behavior,as response (R) to these reactions.

In this paper, two groups of factors relating to the consumer are presented as stimuli. On the one side, internal factors (mobile phone addiction and perceived control) and on the other side, external factors (perceived entertainment and subjective norms). Since attachment includes three main characteristics -emotion, cognition and practice- (Kyle *et al*., 2005), the stimuli studied in this paper can be associated to each of those dimensions. Among the internal factors, the mobile phone addiction represents the emotional or affective part of attachment, related to consumer identity and personality. Perceived control reflects the cognitive aspect referred to the functional value that the consumer gives to the device, its knowledge and belief about it, represented by dependence. Finally, the two proposed external factors denote consumer conative or practical aspect, the social bond developed from individuals' own positive entertaining experiences and the influence of third parties through subjective norms.

As for the organism, MPA refers to consumer emotional reaction as a result of the stimuli, ultimately influencing their answer, in this case the intention of buying a travel through mobile device (Figure 1).

Figure 1. Proposed model



Mobile phone addiction is a type of technology addiction, which includes a description of addictive behaviors as a result of repetitive use of certain technology (Waal and Morland, 1999; Chou and Ting, 2003).Its base is an intense use of mobile phones, which can produce feelings of discomfort and irritation in situations of lack of access to mobile phone (Ball and Tasaki, 1992; Park, 2005). There are studies that have suggested that this type of addiction is a significant predictor of intention to use mobile phone (Negahban, 2012; Salehan and Negahban, 2013), its frequent use and attachment to it (Ge, 2014; Konok *et al*., 2016). It is also known that consumers who are more involved and who feel uneasiness, anxiety and insecurity when they do not have their device will feel greater attachment to their mobile device (Wehmeyer, 2007; Wilska, 2003; Wu *et al*., 2016). In consequence,

H1: Mobile phone addiction engendersMPA.

Perceived control represents individualperceptions regarding the ability to develop the desired behavior (Ajzen, 1991). In the case of mobile phone, perceived control reflects the ability to use and take advantage of the numerous applications and features that a mobile phone offers. This variable helps to explain situations in which the perceived availability of resources and skills needed to successfully perform a given behavior affects the adoption decision. In this regard, it has been confirmed that individuals who perceived control over their devices are more involved in the use of them (Walsh and White, 2007) and show an increased intention to use mobile technology (Venkatesh *et al*., 2012). In addition, individuals identify themselves more with those aspects over which they perceived more control (Johe and Bhullar, 2016). Therefore,

H2: Perceived control engendersMPA.

Consumers buy for extrinsic or utilitarian reasons, but also for intrinsic or hedonic reasons. Hedonic reasons related to entertainment, finding fun and enjoyment are determining factors of the attitude towards the use of mobile services (Cyr *et al*., 2006; Nysveen *et al*., 2005). Previous literature has confirmed that consumers who have experienced enjoyment when shopping in a store develop affective bonds and attachment towards the store (Johnstone and Conroy, 2008; Vlachos *et al*., 2010). In this line, consumers who experience an entertainmentin the purchase, show an increased degree of attachment to the products and the company (Schifferstein and Zwartkruis-Pelgrim, 2008; Vlachos *et al*., 2010). In this study, the same is proposed for the attachment to the mobile device that allows that entertaining experience. Hence,

*H3:*Perceived entertainment engenders MPA.

The mobile phone also has a social component, which is linked to the so-called subjective norms. These include individual perception that most people who are important to him/her think it should or should not perform certain behavior (Pedersen, 2005). In this sense, attachment usually develops in association with a context that includes, among other things, relationships and shared experiences with others (Kyle *et al*., 2005). It has also been confirmed that there is a relationship between attachment and the way that people relate to others (Lin, 2015). If we focus on mobile contexts, these devices also are associated with friends, family and social connection (Vincent *et al*., 2005), as well as with a social status or as a sign of belonging to a group (Wehmeyer, 2007). That is why those individuals who have integrated their mobile device in their daily actions of communication and socialization will develop greater attachment to these devices (Wehmeyer, 2007). Thus,

*H4:*Subjective norms engenderMPA.

According to the Theory of Reasoned Action (Fishbein and Ajzen, 1975), the intention to act, including purchase intention, derives from a positive attitude and a social bond to a task. In this sense, it has been confirmed the existence of a strong relationship between bonding and purchase intention (Eastlick *et al*., 2006) and between attachment and different forms of consumer behavior (Vlachos *et al*., 2010). In the context of mobile technology, the emotional responses that the individual develops with their mobile device are a key to the future adoption of new services related to it (Vincent *et al*., 2005). In addition, consumerMPA has been regarded as a specific construct of mobile user behavior (Wehmeyer, 2007), which may influence the active use of the mobile phone and their purchasing behavior (Wu *et al*., 2016). Therefore,

*H5:*MPA generates consumer intention to purchase via mobile devices.

3. Method

Nowadays, Spain is the leader in smartphones subscriptions with of 81% of the total of mobile phones used in the country (Fundación Telefónica, 2015). The mobile phone in Spain is the media most frequently used for tasks such as communication and information, electronic banking, social networking, and software and games downloading. Precisely,45% of the Spanish mobile consumers carried out a purchase using their mobile device, while 64% of the obtained services are those related to travel (IAB, 2015). With these facts in mind, for this empirical study information from Spanish consumers that have already bought travel related services by Internet was gathered. First, a pilot test with 5 experts in travel marketing and 10 experienced online and mobile travel buyers was performed to identify and correct deficiencies in the survey. Second, using questionnaires, information was collected from randomly chosen 220 Spanish travelers that have bought online travel related services. The respondents answered the questionnaire regarding their last travel (transport and/or accommodation) bought online and their intention to buy the next one via mobile phone. In Table 1 are provided details of the sample.

Table 1. Sample characteristics.

Socio-demographic and economic characteristics of the sample		***%***
Gender	Men	46.3
	Women	53.7
Age	18-24	10.1
	25-34	52.3
	35-44	21.6
	45-54	12.4
	55-64	3.1
	> 64	0.5
Education	Basic studies	1.9
	High school/ Associate degree	16.1
	University degree	44.5
	Postgraduate/PhD	37.5
Monthly Home Income	≤ 900€	16.5
	901 to 1200€	12.9
	1201 to 1500€	16.1
	1501 to 2000€	17.9
	2001 to 3000€	18.3
	3001 to 4000€	9.6
	> 4000€	8.7
Purchase (times/per year)	1-3	69.3
	4-7	16.5
	8-10	5
	> 10	9.2
Travel type	Transport	50.4
	Accommodation	17.9
	Both	31.7
Travel plan	Yes	79.4
	No	20.6

In order toguaranteethe readability and clarity of the survey, the translation and back translation were completed by three Spanish language professors, who are English native researchers (Brislin, 1980). The scales adapted to the context of this study have their base in different studies and 5-point Likert scales were used to measure the variables, detailed in Table 2 and Table 3.

Since formative (i.e. MPA, perceived entertainment, subjective norms and mobile phone addiction) and reflective variables (i.e. intention to purchase via mobile devices and perceived control) are treated, SmartPLS3was used to analyze the data (Ringle *et al*., 2015; Diamantopoulos and Winklhofer, 2001; Bagozzi and Yi, 2012). Moreover, we conceptualize MPA as a formative second-order construct that is created by three first-order dimensions, namely dependence, identity and social bond (Kyle *et al*., 2005). These are assumed to be reflective variables. Attending MacKenzie, Podsakoff and Jarvis (2005, p. 715), second-order formative measurement model "faithfully represents all of the conceptual distinctions that the researcher believes are important, and it provides the most powerful means of testing and evaluating the construct". Following Diamantopoulos *et al*. (2008), the fact that MPA is a higher-order construct means that the measurement assessment needs to be undertaken at two levels.

Thus, first of all, at the first-order level, the construct validity, including internal indicator consistency, the convergent validity and the discriminant validity of the measurement model was assessed (Hair *et al*., 2011). Consequently, the direct relations between dependence, identity and social bond dimensions and their reflective indicators were confirmed, showing significant values (t>1.96, at a confidence level of 95%). Furthermore were estimated Cronbach α and composite reliability (CR) coefficients, which representing values higher than 0.7 and 0.6 (Bagozzi and Yi, 1988), demonstrated the reliability and internal consistency of the scales. With the purpose of confirming the convergent validity, the global quantity of variance for each item explained by the latent constructs and defined with the average variance extracted (AVE) was measured, presenting measures higher than 0.5 for each case (Bagozzi and Yi, 1988). In Table 2 the results from the analysis of the first-order measurement model, showing the MPA construct, are presented.

Table 2. First-order measurement model.

Variable	*Reflective dimensions*	*Items*	*Loadings λ (t-value)*
MPA	Identity (α=.894, CR=.928, AVE=.763)	My mobile phone is part of me.	.915 (79.214)
		I identify a lot with my mobile phone.	.922 (71.435)
		I am very attached to my mobile phone.	.905 (64.539)
		My mobile phone is very close to what I am.	.741 (19.344)
	Dependence (α=.876, CR=.924, AVE=.801)	My mobile phone is the best among those of the same kind.	.902 (49.490)
		Using my mobile phone satisfies me more than using any other mobile phone.	.915 (80.787)
		I would not change my mobile phone for another.	.867 (35.342)

	Social bond (α=.836, CR=.908, AVE=.711)	Buying by my mobile phone would make me feel good.	.863 (41.278)
		I have a lot of fond memories about my mobile phone.	.844 (31.918)
		Buying by my mobile phone would make me happy.	.896 (53.398)
		I show my mobile phone to others.	.765 (18.189)

Since the measurement of higher-order models follows the same procedure employedfor first-order models (Chin, 1998; Ulaga y Eggert, 2005; Hair *et al*., 2011), the second-order measurement model in our study was estimated to confirm the reliability and the validity of the scales. Thus, the previously validated MPA construct was incorporated in the second-order measurement model (Ulaga and Eggert, 2005; Iacobucci, 2010). After depurating the scales, where two items from the perceived entertainment variable and one item from the subjective norms were deleted because of non-significant weight values, it was confirmed that both reflective and formative constructs show significant values at a confidence level of 95% (t>1.96), for all weights and loadings coefficients of their correspondent items. Cronbach α and CR values demonstrated the reliability and validity of the scales, and the convergent validity of the model was likewise confirmed. These results are presented in Table 3.

An essential element for any model containing formative constructs relates to establishing whether multicollinearity is present among the formative components,which is why the Variance Inflation Factor (VIF< 5) and the Tolerance Value (IT> 0.1) were estimated, discarding in this way the multicollinearity for our model (Diamantopoulos and Winklhofer, 2001; Hair *et al*., 2006; Hair *et al*., 2011). Moreover, the convergent validity was confirmed, through AVE showing measures higher than 0.5 (Bagozzi and Yi, 1988) (Table 3).

Furthermore, attending the Fornell-Larcker Criterion (Fornell and Larcker, 1981), we proceeded to confirm that AVE for each construct in every case is greater than its squared correlations with other constructs, by which the discriminant validity between all the constructs in the modelwascorroborated (Table 4).Moreover, since the Heterotrait-Monotrait Ratio (HTMT) between the reflective variables perceived control and intention to purchase is 0.384 (lower than 0.90), the discriminant validity is again proved to be established (Henseler *et al*., 2015).

Additionally, was performed Harman's single-factor test in order to discard the problem of common method variance(Andersson and Bateman, 1997; Podsakoff *et al*., 2003; Chang *et al*., 2010). The factor analysis,loading all of the items in one factor, showed that the unique factor explains40.5% of the data variance. The cumulative variance explained by all the factors in the model is 80.5%, confirming like this that in the proposed model there is no problem of common variance method.

Table 3. Second-order measurement model estimation.

Variable (Authors of reference)	*Formative dimensions*	*Weights*	*t-value*	*VIF*	*IT*
MPA[7,16,17,57]	Identity	.346	2.682	2.000	.500
	Dependence	.667	10.216	1.951	.513

	Social bond	.774	6.647	2.283	.438	
Perceived entertainment[31,58]	Purchasing a travel by mobile phone would help me relax.	.473	3.003	2.676	.374	
	Purchasing a travel by mobile phone would help me entertain.	.583	3.806	2.676	.374	
Subjective norms[59,60]	If I purchased a travel by mobile phone, most of the people important to me would regard it as useful.	.498	2.615	1.967	.508	
	If I purchased a travel by mobile phone, most of the people important to me would regard it as valuable.	.586	3.223	1.967	.508	
Mobile phone addiction[58,61,62]	Using my mobile phone is one of my daily activities.	.672	6.930	1.601	.625	
	If my mobile phone does not work, I really miss it.	.788	9.973	3.592	.278	
	My mobile phone is important in my life.	.781	10.435	3.228	.310	
	I cannot go for several days without using my mobile phone.	.891	15.518	2.927	.342	
	I would be lost without my mobile phone.	.531	2.709	2.909	.344	
Variable	*Reflective dimensions*	*Loadings* λ	*t-value*	*AVE*	*CR*	α
Intention to purchase a travel via mobile phone[59,60]	My general intention to purchase a travel by mobile phone is very high.	.934	74.501			
	I will consider buying a travel using a mobile phone.	.886	30.036	.837	.939	.903
	Next time I purchase a travel, if it is possible, I will do it using a mobile phone.	.923	81.392			
Perceived control[60,63]	I have a profound knowledge about mobile communications.	.846	30.712			
	In comparison to my circle of friends I am an expert in mobile communications.	.917	72.553	.760	.905	.843
	In my circle of friends I am usually the first who knows about the latest mobile phones.	.850	41.077			

Table 4. Correlation matrix Fornell-Larcker criterion.

	ENT	IPM	MPA	PC	SN	MPADD
ENT						
IPM	.437					
MPA	.631	.368				
PC	.397	.338	.628			
SN	.415	.350	.496	.398		
MPADD	.364	.156	.594	.390	.375	

Note: ENT- Entertainment; IPM- Intention to purchase by mobile phone; PC- Perceived control; SN- Subjective norms; MPADD- Mobile phone addiction

4. Results

After validating the scales, the proposed hypotheses were tested, through the estimation of the global model. Thus, it was first analyzed if the R^2 of the dependent variables exceeds 0.1 (Falk and Miller, 1992). Accordingly, the R^2 value for mobile phone addiction is 0.657 and for intention to purchase via mobile devices is 0.135. Perceived control, mobile phone addiction, perceived entertainment and subjective norms positively influenceconsumers' MPA. In addition, consumers'MPAinfluences their intention to purchase via mobile phone (Table 5).

Table 5. Global model estimation.

Hypothesis	*β (t-value)*
H1: Mobile phone addiction → MPA	.298 (4.499)***
H2: Perceived control → MPA	.331 (6.155)***
H3: Perceived entertainment → MPA	.346 (5.549)***
H4: Subjective norms → MPA	.110 (1.974)*
H5: MPA → Intention to purchase a travel via mobile phone	.368 (5.310)***

*** $p<0.001$; *$p<0.05$

Moreover, with the aim of determining the influence that the latent variables have on the dependent constructs, the changes in the R^2had to be explored (Wong, 2013). Attending the indications by Cohen (1988), small, medium and large effect sizes are represented with the subsequent values $f^2 \geq 0.02$, $f^2 \geq 0.15$ and $f^2 \geq 0.35$, respectively. Our results show that the subjective norms (f^2=0.026) have a minor impact on MPA,in contrast to the rest of the variables on MPA: perceived entertainment f^2=0.257; perceived control f^2=0.234and mobile phone addiction f^2=0.197. Likewise, MPA has amedium effect size to explain the intention to repeat the purchase,presenting f^2=0.156.

5. Discussion and conclusion

Nowadays, mobile phones are seen to be the personal and non-transferable devices that consumers continuously carry with them, developing in this way different degrees of attachment with them. In this sense, this paper seeks to explore how consumers' MPA influences their buying behavior. From the results it can be concluded that both external factors (perceived entertainment and subjective norms) and internal factors (perceived control and mobile phone addiction), significantly influence consumers' MPA. However, entertainment shows slightly greater influence on MPA than the other factors do. Thus, we can conclude that the consumers who perceive more entertainment and control when using their mobile phone for purchasing a travel will develop a higher sense of attachment. Likewise, consumers addicted to mobile phone usage that perceive control over it, will be more likely to develop mobile phone attachment. It is interesting to notice the scarce influence that social circles' opinion (such as friends or family) has on MPA, in comparison to entertainment, addiction or control. Finally, consumers who feel attachment with mobile phone will have greater intention to buy a travel by mobile, which corroborates some proposals raised in previous literature (Wu *et al.*, 2016).

Specifically, this work contributes to the academic literature proposing firstly, through the application of S-O-R model for mobile purchase, thatMPA is as a central variable in the

process of consumers' buying behavior regarding travels, preceded bytheirinternal and external factors.Secondly, using both internal and external factors influencing customers' behaviour and giving a more complete image of the influences that motivate their intention to place a mobile purchase. Finally, analyzing the impact of personality factors, such as MPA and mobile phone addiction, with experienced online buyers prone to purchase by mobile phone, adds to the body knowledge in marketing.

5.1. Managerial implications

The mobile phone is a particularly personal article that consumers usually bring with themselves wherever they go, which allows companies to reach buyers anywhere and anytime. Bearing this in mind, companies must take advantage of buyers' MPAfor influencing consumers in the use of the mobile phone as ashopping tool, and manage through this their marketing strategies. Specifically, for developing travelers' MPA, it is necessary to stimulate their dependence, identity and social bond with the mobile phone. Therefore, to reinforce the identity with the mobile phone, companies couldpersonalize and differentiatetheir travel Apps and at the same time promote entertainment by gamification. Moreover, if companies offer ubiquitous mobile services, consumers' dependencewith the mobile could be increased. Furthermore, to increase the consumers' social bond with the device, firms should strengthen the use of mobile phone for travel related services and encourage comments and WOM about travel Apps and social networking through mobile phone.

In addition, our results indicate that consumers with a greater MPA are those who perceive more entertainment when buying by mobile phone, are more influenced by the technological behavior of their friends, relatives and fellows, who show increased use of the mobile phone and have more control over itsdifferent possibilities for use. In this regard, companiescouldboosttravelers' entertainmentand group interaction when they browse or purchase atravel. For example, travel apps could let consumers to enjoy explanatory videos about destinations or share photos and memories with others tourists. In addition, companies must provide attractive design, and easy navigationfrom any operative system,so that buyerscan feel that they control the device and the system of mobile shopping. Finally, firms must keep in mind the intensive usage made of these devices revealed by the nowadays mobile addiction and attachment (understood as not compulsive behavior). Therefore, since mobile phones areused for a multitude of tasks in a ubiquitous manner, anywhere and anytime, firms should make an effort to offer a 360º consumer experience (i.e. becoming a mobile tourist guide and companion for travelers). In addition, travel mobile operators must assess the integration of mobile commerce strategy with theironline and offline strategy, since it is necessary to achieve anomni-channel sale strategy.

5.2. Limitations and future research

This work has some limitations that could be addressed in future work. First, we have considered specificinternal and external factors related to consumers. Future studies could consider other important variables such as mobile convenience, consumer personality or technology readiness. In addition, the model could be extended, highlighting other aspects that may be related to a more general shopping environment including different contexts and even a cross-cultural study, overcoming the restriction of this model specified to the mobile purchase of travels for the Spanish market. Second, this study considers MPAas a second order construct. Future research should consider the independent effect of each dimension which could enrich the knowledge about MPAeffects. In addition, this work hasbeen applied

to the context of purchasing services and specifically for the mobile context. It would therefore be interesting to develop a model for the purchase of different products and services, not necessarily related to travel.

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