

# **Are you technologically prepared for mobile shopping?**

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## **Abstract**

This study explores the influence of travellers' technology readiness on variables derived from the Theory of Planned Behavior (Ajzen, 1991) in the context of mobile purchases of travel-related services. The model estimation, using structural equation modelling and data from 220 Spanish online buyers of travels, suggests that technologically ready customers are more prone to be persuaded by others' opinions, perceive more control and have greater intentions to purchase a travel by mobile phone. In contrast, consumers' technology readiness does not appear to improve their attitudes toward mobile phone advertising. This technology readiness construct partially extends the Theory of Planned Behavior and constitutes a primary determinant of consumers' intentions to purchase travel services through mobile phones.

**Keywords:** Travel services; mobile phones; purchase intention; technology readiness; Theory of Planned Behavior.

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## **1. Introduction**

In recent years, mobile phones have revolutionised customers' decision-making process and become essential, primary tools for information gathering, communication, planning and shopping (comScore, 2017). On average, 75% of mobile Internet users regularly purchase through their smartphones or tablets (IAB, 2016a), and purchases of

travel services (transport and accommodation) are particularly prevalent, accounting for 30% of all mobile purchases (m-purchases) undertaken. In Spain, 41% of mobile phone users purchase through mobile phones and in 2016, 35% of the services they purchased by mobile phone were related to travel, in line with evidence that clicks on mobile advertising (m-advertising) associated to travel and tourism (39%) rank second in frequency, behind only technology advertising (IAB, 2016b). Such changes reflect the benefits and amenities that various mobile applications offer. Beyond making the planning process easier and faster, travelling has become a technological practice; mobile applications provide driving directions, transportation information, road services and useful travel tips, to name just a few (Younas & Mostéfaoui, 2011). Accordingly, substantial research investigates the changes that mobile technologies have triggered when it comes to travel-related information searches and planning (Park & Huang, 2017).

Yet some features of m-purchases still appear to limit adoption of these shopping technologies, related to security concerns, uncertainty, lack of control and a sense of being overwhelmed by mobile technology (Lu, Wang, & Hayes, 2012). These circumstances add to the complexity and dynamism of travel experiences coming from the nature of travel-related services, suggesting a need to focus on relationship elements (Lindberg, Hansen, & Eide, 2014). To advance insights into customers' intentions to purchase travel-related services through mobile phones (Xiang, Magnini, & Fesenmaier, 2015), it becomes essential to study the influence of individual factors on their intentions to use their mobile phones to purchase travel services (Meng, Kim, & Hwang, 2015). Some prior research has explored customers' adoption of mobile technology for tourism, usually grounded in classic theories such as the Technology Adoption Model (TAM) (Davis,

1989) or the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis and Davis, 2003). But these approaches emerged from research into organisational settings and users' perceptions of them, such as employees who use technology, free of charge, to achieve work-related goals, rather than reflecting customers' perceptions and behavioural responses (Bagozzi, 2007; Park & Huang, 2017). Another model might better reflect customer behavioural intentions, namely, the Theory of Planned Behavior (TPB) (Ajzen, 1991).

By applying an extended version of the TPB, this study considers customers' technology readiness (TR) with regard to using mobile phones to complete a travel-related purchase. Our objective is to explore the effect of the TR construct (which consists of optimism, innovativeness, discomfort and insecurity) on the TPB variables (attitude toward m-advertising, perceived control, and subjective norms) and on customers' intentions to purchase travel services through mobile phones. Despite a general consensus that personality factors are important determinants of customers' behavioural intentions (Turkyilmaz, Erdem, & Uslu, 2015), to the best of our knowledge, no other study has explored the influence of TR as part of the TPB in m-purchase contexts.

## **2. Application of TPB to Mobile Purchases of Travel Services**

The TPB has been broadly corroborated in various contexts (Amaro & Duarte, 2015; Gopi & Ramayah, 2007) because it successfully predicts customers' behaviours in different environments and sectors. Its elements—subjective norms, perceived control and attitudes—have positive effects on behavioural intentions and actual behaviour. As defined in this theory, subjective norms refer to the social pressure that customers

perceive when deciding to carry out certain behaviours, and perceived control refers to an 'individual's perception of ease or difficulty in performing the behaviour' (Ajzen, 1991, p. 188). Customers' attitude reflects their evaluation or appraisal of certain behaviour (Ajzen, 1991). Finally, 'intentions are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour' (Ajzen, 1991, p. 181).

Prior research frequently includes customers' attitudes toward m-purchases (Yang, 2012) and related perceptions of usefulness or ease of use (Duane, O'Reilly, & Andreev, 2014) as antecedents of m-purchases (Table 1).

*-Table 1 near here-*

Yet this research is limited in its assessments of attitudes toward m-advertising (Hongyan & Zhankui, 2017), which refers to any promotional activity sent and received through mobile devices (Nwagwu & Famiyesin, 2016). The associated attitudes have been studied as an enrichment of online and in-store shopping (Ghose, Li, & Liu, 2015; Kim, Kang, Ha, & Song, 2016); but few studies address their effects on m-purchases (Hongyan & Zhankui, 2017). Therefore, we investigate customers' attitudes toward m-advertising, as a vital antecedent of m-purchases, directly leading to clients' attraction (Sultan, Rohm, & Gao, 2009; Watson, McCarthy, & Rowley, 2013).

### ***2.1. Extension of the TPB: Inclusion of TR***

TPB has been confirmed in a variety of contexts (Gopi and Ramayah, 2007; Amaro and Duarte, 2015), successfully predicting customers' behaviours in different

environments and sectors. According to Ajzen (1991), the TPB is open to extensions, such that it might integrate other constructs that can capture greater proportions of the variance in intentions and behaviours. For instance, personality-related factors, which affect individual cognitive interpretations of tasks (Lu, 2014) are found to be particularly important for shaping travellers' favourable or unfavourable behavioural responses (Casaló, Flavián, Guinalú, & Ekinci, 2015). Prior literature also shows that customers' personalities and psychographic characteristics largely define their new technology adoption behaviour (Chen & Li, 2010; Lin & Hsieh, 2006). In the online travel sector, in particular, travellers' attitudes and purchasing intentions are influenced by their personality characteristics (Amaro & Duarte, 2013), and online travel buyers tend to be more prone to try new technologies, such as mobile technologies (Heung, 2003). However, when it comes to m-purchases, customers still encounter some mobile channel-related issues. Such challenges could be overcome by high levels of customers' TR, which would alter their decision to carry out m-purchases (Lin & Chang, 2011). Massey, Khatri, and Montoya-Weiss (2007) predict that depending on their TR levels, people might exhibit a range of responses, from strongly positive to strongly negative, that would describe their acceptance/rejection of mobile technologies for travel-related purchases. Therefore, we propose integrating TR into the TPB, to reflect the importance of travellers' personality for decisions about m-purchases.

Specifically, TR was introduced to marketing literature by Parasuraman (2000), who researches customers' readiness to use new technologies in light of the rising enactment and increasing use of those technologies in service delivery. Defined as 'people's propensity to embrace and use new technologies for accomplishing goals in home life and

at work', TR is determined by several drivers and inhibitors of new technology usage (Parasuraman, 2000, p. 308). The drivers include optimism and innovativeness; inhibitors refer to discomfort and insecurity. Optimism is 'a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives'; innovativeness represents the 'tendency to be a technology pioneer and thought leader'; discomfort implies a perception of a 'lack of control over technology and a feeling of being overwhelmed by it'; and insecurity is defined as 'distrust of technology and skepticism about its ability to work properly' (Parasuraman, 2000, p. 311). These four dimensions of TR predict customers' technology-related perceptions and behaviours (Lin & Hsieh, 2006), so this personal variable can explain customers' intentions, with positive links to technology acceptance (Walczuch, Lemmink, & Streukens, 2007; Meng et al., 2015) and technology usage (Westjohn, Arnold, Magnusson, Zdravkovic, & Zhou, 2009). Despite the likely benefits of including TR to explain customers' intentions to purchase travel through a mobile phone, it rarely has been observed in previous mobile technology literature (Sophonthummapharn & Tesar, 2007).

Optimism and innovativeness, as mentioned earlier, are regarded as positive aspects, incentives of the TR, since they drive customers towards a positive attitude regarding new technologies, while discomfort and insecurity are considered inhibitors of customers' intention to use new technologies (Parasuraman, 2000; Chen and Li, 2010).

Hence, we posit that people who are optimistic have positive attitudes toward technology and likely accept the situation they are in, as it is; they worry less and do not focus on the possible negative outcomes of an unfamiliar situation, such as new technology usage (Walczuch et al., 2007; Son and Han, 2011). Those aspects enable their

uses of the Internet and mobile phone services (Massey, Khatri, & Ramesh 2005). Thus, optimistic customers should be more prepared and prone to use new technologies and other innovations than less optimistic ones (Son & Han, 2011).

Innovativeness also is an antecedent of adoption intentions for mobile commerce (m-commerce) context (Zarmpou, Saprikis, Markos, & Vlachopoulou, 2012). It reflects prior adoptions of new ideas and a willingness to try new technologies (Rogers, 2010). More innovative people feel comfortable using new technologies, do not want to miss out on the benefits of their use, and are prone to try them (Walczuch et al., 2007; Son and Han, 2011). They take risks and tend to trust technology (Lu et al., 2012). Moreover, the use of a mobile phone seems to drive greater technological innovation (Choliz, 2010).

In contrast, sensitivity to the insecurity associated with new technologies is a limiting factor. Ukpabi and Karjaluoto (2017) find that a key impediment to new technology adoption is insecurity concerns. People's sense of insecurity may stem from individual aspects, such as their own ability or skills for using new technologies, or from distrust in a platform (mobile site/app) that appears less than secure for completing the purchase, as well as from a more general mistrust of new technologies due to doubts about security and privacy (Lu et al., 2012; Parasuraman, 2000). A customer who senses a lack of security is more concerned about the safety of personal information (Massey et al., 2005). Intentions to purchase through mobile phones then might increase if they provide more secure purchasing experiences (Groß, 2014) and avoid elements that introduce insecurity into the process.

Finally, perceptions of complexity or lack of control over the technology, as well as a fear of technology-based services, tend to be summarised as discomfort, which then

results in non-intentions to use new technologies (Parasuraman, 2000; Lu et al., 2012). People with high discomfort levels feel uncomfortable with the mobile environment. Accordingly, they choose not to use mobile services and will not further accept m-advertising (Tsang, Ho, & Liang, 2004). If a person feels discomfort about a certain action, it can result in adverse effects on his or her intentions to use new technologies.

In summary, if individuals believe in their own ability and situational opportunities to achieve desired results—namely, m-purchase of travel services—they should have positive attitudes toward m-advertising, high perceived control, encouraging subjective norms and strong intentions to use the mobile phone technology to complete this action. Beyond the direct effects of innovativeness and optimistic attitudes on intentions to engage in m-commerce and m-purchases of travel services (Morosan, 2015), perceived security and comfort are crucial motives that lead customers to engage in favourable actions toward the service provider (Lu & Yu-Jen Su, 2009; Akhter, 2015).

## ***2.2. The Effects of TR in an Extended TPB***

In a review of models or theories used to explain the effects of TR, we found some studies that consider it in relation to or as an antecedent of the TAM (Yi, Tung, & Wu, 2003; Godoe and Johansen, 2012); only one includes TR as an antecedent of the TPB (Chen & Li, 2010). The positive influence of TR on attitudes, perceived control and subjective norms has been confirmed, though not in the context of mobile service usage, nor in relation to the tourism sector. The subsequent hypotheses predict the TPB relations and then the effects of TR on TPB variables.



In the mobile context, it has been empirically confirmed that the social influence predicts customers' mobile services adoption and usage decisions (Koenig-Lewis, Marquet, Palmer, & Zhao, 2015; Morosan, 2015) and is particularly important for initial stages, when customers first face a new technology and lack any previous experience with using it (Schierz, Schilke, & Wirtz, 2010). Perceived control reflects customers' beliefs about their own resources and opportunities for using new technologies' tools (Venkatesh, 2000). In new technology settings, perceived control is essential for sparking adoption behaviour, so travellers who perceive high control over their mobile phone use should exhibit a greater likelihood of making a purchase (Maity, 2010; Park & Huang, 2017). Furthermore, customers' internal motivations for new technology usage influence their m-commerce usage intentions (Lu, 2014).

Because substantial market share still involves channels other than mobile phones, it also is necessary to consider customers' attitudes toward other mobile services that might influence their behavioural intentions, such as attitudes toward m-advertising (Kim, Joo, & Lee, 2016). According to Nwagwu and Famiyesin (2016, p. 269), m-advertising offers great potential for both customers and marketers, because 'it is the only advertising medium that consumers carry with them almost everywhere they go'. Mobile phone advertising strategies appear crucial to m-commerce; for companies, they are important for empowering innovation enhancement and for enduring with the constant advancements of digital technologies (Sharif, 2017); for customers, they allow the voluntary interaction with the ad content, including value-added personalised services, and encourage active and flexible communication between companies and customers (Yeh & Lin, 2010), all these considered decisive in travel-related purchasing behaviour

(Park & Huang, 2017). M-advertising, based on its capability to bring closer the two parties, to personalise the service and to be noticed and appreciated by customers, is found to be the perfect tool for building a relationship between companies and customers (Merabet & Benhabib, 2017), established by customers' intention to purchase a travel. Additionally, m-advertising is likewise found to be vital for self-service technologies', enabling favourable customers' behavioural intentions (Chen, Yu, Yang, & Wei, 2018) and achieving new customers (Okazaki, Molina, & Hirose, 2012). Thus, as it was substantiated in the literature, m-advertising will have a unique influence on customers' intentions to purchase the service (Noor, Sreenivasan, & Ismail, 2013; Hongyan & Zhankui, 2017).

In combination, we predict that subjective norms, customers' perceived control and their attitudes toward m-advertising, as independent TPB variables, influence customers' intentions to purchase travel through their mobile phones. Formally, the following hypotheses are proposed:

*H1: Subjective norms of using mobile technologies positively influence customers' intentions to purchase travel by mobile phone.*

*H2: Customers' perceived control of using mobile technologies positively influences their intentions to purchase travel by mobile phone.*

*H3: Customers' attitudes toward m-advertising of travel positively influence their intentions to purchase travel by mobile phone.*

People's technological literacy varies with their attitudes toward mobile phone usage (Skog, 2002). Customers' capabilities regarding new technologies are significant incitements of attitudes toward technology-enabled services (Wang, So, & Sparks, 2017). Customers' positive perceptions of the use of new technologies have positive effects on their approach to m-advertising and related intentions (Kim et al., 2016). Accordingly, customers' technology acceptance is related to their attitudes toward m-advertising; if customers are favourable toward mobile technologies, they respond better to m-advertising (Venkatesh & Davis, 2000; Wixom & Todd, 2005). If m-advertising constitutes an innovation, and especially since the introduction of smartphones (Bauer, Barnes, Reichardt, & Neumann, 2005; Persaud & Azhar, 2012), we can expect a positive relationship between TR and customers' attitudes toward m-advertising. People who can understand the features and usage of innovations (new technologies) also perceive them as less complex (Moreau, Lehmann, & Markman, 2001) and thus form more positive attitudes. It was proposed in the literature that an improved familiarity with the mobile medium enhances customers' attitudes and behaviours towards participation in m-advertising (Varnali, Yilmaz, & Toker, 2012; Hongyan & Zhankui, 2017). Hence, customers' attitudes towards m-advertising will be determined by their knowledge regarding the usage of the new technology (Sharif, 2017). Moreover, consumers who perceive control in the usage of new technologies, who are prone to experience novel products on the market, and who consider themselves as technologically skilled, present a positive attitude towards m-advertising (Okazaki, 2007; Beneke, Cumming, Stevens, & Versfeld, 2010; Gao, Rohm, Sultan, & Huang, 2012; Sharif, 2017). Mobile communications provide the technological basis for m-advertising, so the more

acquainted and better prepared a customer is with the usage of new technologies, the better her or his attitude toward m-advertising should be (Bauer et al., 2005). That is:

*H4: Customers' TR positively influences their attitudes toward m-advertising of travel.*

Moreover, when customers have personal resources and opportunities, they overcome difficulties associated with using new technologies, which influences them to perceive greater control over a specific task (Ajzen, 2002)—such as purchasing travel by mobile phone. A person who is optimistic and confident about his or her ability to perform a technology-related task perceives greater control in that situation (Fagan, Neill, & Wooldridge, 2004). If environmental resources and conditions signal secure, comfortable opportunities for obtaining a service, it further enhances customers' perceived control (Gironda & Korgaonkar, 2014). Therefore, customers' readiness, translated as their capacity to carry out a task, positively affects the control that they perceive regarding the execution of an activity (Gironda & Korgaonkar, 2014), suggesting the following hypothesis:

*H5: Customers' TR positively influences their perceived control of using mobile technologies.*

Subjective norms are individual beliefs about whether significant others believe the person should perform a specific behaviour (Ajzen, 1991; Narteh, Mahmoud, & Amoh, 2017). Customers commonly strive to fulfil the expectations communicated by their surroundings, which is easier to achieve if they already have a positive image of

themselves and feel comfortable with the task in question (Bauer et al., 2005; Marinkovic & Kalinic, 2017). If customers feel ready to use new technologies, they will be more confident about the norms of reference groups regarding new technology use. A positive relationship has been established between customers feeling capable of adopting a new technology and subjective norms (Alryalat, Rana, & Dwivedi, 2015). Yin and Wu (2008) suggest that subjective norms about purchases are conditioned by customers' capability to use new technologies, though they also affirm the importance of individual knowledge and skills. Card, Chen, and Cole (2003) assert that skilled online travel buyers also are strong opinion leaders who influence online travel-related decisions. Furthermore, TR creates a positive impression of mobile technology as a tool for goal achievement (Wong, Tan, Hew, & Ooi, 2016), and it affects social influences in e-service adoption contexts (Borrero, Yousafzai, Javed, & Page, 2014). Customers who are more prone to understand and carry out tasks also are more capable of improved communication with other parties (D'Urso & Rains, 2008). Thus, a person who perceives him- or herself as technologically ready, likewise develops positive assumptions that others will perceive this readiness with regard to m-purchases. Accordingly, we suggest:

*H6: Customers' TR positively influences subjective norms of using mobile technologies.*

Finally, customers' technological preparation is a vital antecedent of new technology adoption (Yang, 2012), with a profound impact on new technology usage intentions (Yang & Sattayatham, 2016). Considering the four elements that compose TR, customers who exhibit greater optimism and innovativeness (and less insecurity and discomfort)

have more positive intentions toward the use of new technologies, because they do not focus on the negative aspects (Chen & Li, 2010). Massey et al. (2005) underline that customers possess a variety of beliefs, and their views and attitudes toward new technologies combine both positive and negative aspects, driving their adoption and use of technology or else pulling them away from it. The mobile environment also creates a more ready balance between these positive and negative aspects, so customers' intentions to engage in m-purchases can emerge (Lu & Yu-Jen Su, 2009). In fact, online travel buyers will show a high likelihood to purchase travel through mobile phones when they perceive that doing so is useful, simple, and easy and feel prepared to complete the transaction (Park & Huang, 2017). Therefore, with our last hypothesis, we predict:

*H7: Customers' TR positively influences their intentions to purchase travel by mobile phone.*

In line with our research objective, we propose a consideration of TR as an antecedent of subjective norms, customers' perceived control, attitudes toward m-advertising and intentions to purchase, as manifested in the TPB (Figure 1).

*-Figure 1 near here-*

### **3. Research Methodology**

#### ***3.1. Sample and Scale Characteristics***

This study began with a pre-test with 5 travel marketing scholars and 20 experienced online travel buyers, then collected information with questionnaires distributed to 220

Spanish travellers who bought travel-related services online. These data were collected at bus and train stations, airports and travel agencies, to ensure a sample of actual travellers. To complete the survey, respondents had to be mobile phone users who previously had bought some kind of a trip online (transportation and/or accommodation).<sup>1</sup> Participants answered the questionnaire with regard to the last travel they bought online and provided their intentions to buy their next travel experience via mobile phone.

To collect a sample of customers with similar experience with online travel purchases, a filter question at the beginning of the survey identified their online travel purchase habits. Specifically, 85.5% of respondents had purchased travel services online approximately three to four times in the past year, and 14.5% bought them at least twice. Table 2 contains additional information about the data gathering process.

*-Table 2 near here-*

In Table 3 we provide demographic and socioeconomic details of the sample. The typical customers in our study are women, from 25 to 34 years of age, commonly with a university degree, who mainly earn 1201–3000€ monthly. These traits are similar to average Spanish e-shoppers of travel-related services, who have been described as 25–44 years of age, with monthly home incomes greater than 1600€, and who have bought travel-related services online in the past 12 months (INE, 2016).

*-Table 3 near here-*

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<sup>1</sup>Before they started the questionnaire, respondents received an explanation of what we meant by ‘travel/trip’, which included two categories: package (complete or partial) or independent tour (Meng, 2010). In addition, the transportation measure reflects the type of transport customers bought, such as airplane, bus, train or boat. Customers could specify if the trip they purchased was only transportation, only accommodation or transportation and accommodation together, which reduced the chances that they interpreted the concepts differently.

Because consumers cannot evaluate travel-related services before their purchase, they face considerable uncertainty (Kah, Vogt, & MacKay, 2016), which may be accentuated in an electronic services environment. Accordingly, we focus on variables that likely mitigate such uncertainty, using existing scales that we adapted to the m-purchase context: from Liljander, Gillberg, Gummerus, and Van Riel (2006) for TR; from Shimp and Kavas (1984) and Bauer et al. (2005) for subjective norms; from Flynn and Goldsmith (1999) and Bauer et al. (2005) for perceived control; from Shimp and Kavas (1984), Pollay and Mittal (1993) and Bauer et al. (2005) for attitudes toward m-advertising; and from Shimp and Kavas (1984) and Bauer et al. (2005) for intention to purchase travel by mobile phone. All variable measures used 5-point Likert scales. For the model estimation, TR represents an antecedent of attitudes toward m-advertising, perceived control, subjective norms and customers' intention to purchase travel through a mobile phone, such that TR becomes part of the extended TPB applied to m-purchases of travel services. We measure TR as a second-order construct. To conduct the analyses, we used the SPSS and LISREL statistical programs.

### ***3.2. Analysis and Results***

For the empirical analysis, we followed the two-step approach recommended by Anderson and Gerbing (1988) and analysed both a measurement model to confirm the scales' validation and a structural model to explore the proposed hypotheses. We first analysed the TR construct alone (first-order model), which consists of four variables (optimism, innovativeness, discomfort and insecurity). As suggested in the literature (Westjohn et al., 2009), this step makes it possible to include the first-order construct in



the second-order model. We conducted a confirmatory factor analysis (CFA) for the TR construct alone that suggested deleting two items (one from innovativeness and one from discomfort), because of their low  $R^2$  values and the correlations of their measurement errors. The results for the first-order measurement model in Table 4 indicate good fit for TR. As a check for the discriminant validity of the first-order model, we also confirmed that the average variance extracted (AVE) for TR was greater than the squared correlations of its variables (Fornell & Larcker, 1981).

*-Table 4 near here-*

As recommended by Chin (1998), the measurement of the second-order model follows the same procedure used to measure the first-order model. Therefore, we estimated the second-order measurement model to test the reliability and validity of the scales, followed by the structural model to test the hypotheses and the fit of the proposed model. The factor loadings of the four factors extracted for TR incorporated the previously validated TR construct into the second-order model (Iacobucci, 2010). In accordance with the guidelines by Fornell and Larcker (1981) and Bagozzi and Yi (2012), the results of the second-order CFA in Table 5 confirm the adequate fit of the measurement model. Due to correlations of the measurement errors, we deleted one item from the intention to buy construct. Then we estimated the Cronbach's alpha and composite reliability coefficients, which confirmed the reliability and internal consistency of the scales by revealing values greater than 0.7 and 0.6, respectively (Bagozzi & Yi, 1988). The AVE in each case also provided values higher than 0.5 (Bagozzi & Yi, 1988), which corroborated the finding that the global quantity of variance within each item is explained by the latent constructs, confirming the convergent validity (Table 6) (The parallel estimations for the first-order

model show the same results.) The only exception is TR, for which the respective values were slightly lower. Overall though, the analysis confirms the reliability and convergent validity of the scales for this study.

To rule out common method bias, we implemented Harman's single-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), by loading all items in one factor into a factor analysis of the principal components. The unique factor explained 26.5% of the data variance, and the cumulative variance explained for all five factors reached 64.5%. Thus, common variance does not appear to be a concern for this model.

*-Table 5 near here-*

*-Table 6 near here-*

Following the scale validation, we tested the proposed hypotheses by estimating a structural equation model. It shows good fit and four hypotheses were confirmed. Table 7 contains the details of the structural model estimation, revealing that customers' TR positively influences subjective norms, perceived control and intentions to purchase travel through a mobile phone. Subjective norms also have positive effects on customers' intentions to purchase travel by mobile phones. Other variables, beyond those included in the TPB, have been controlled in customer purchasing behaviour too (Farag, Krizek and Dijst, 2006; Cao, Xu, & Douma, 2012; Chong, Chan, & Ooi, 2012; Konuş, Neslin, & Verhoef, 2014; Li, Kim, & Wong, 2017), so we considered important to explore their potential influences on the relations proposed in our model. In this way, we could make sure that there would not be vast dissimilarities in customers' purchasing habits and that the obtained results in this study would offer consistent implications for the further depiction of a more precise customer profile. Travel-related purchases require

considerable financial and non-financial involvement (Hanks & Mattila, 2014), so a posteriori, we controlled for the effect of demographic variables (gender and age), type of travel (transport, accommodation or both), previous experience with and frequency of online travel purchases, level of involvement and the percentage of total expenses that correspond to online travel purchases. However, even after controlling for these mentioned variables, we found no changes to the significance of the proposed relationships, as detailed in Table 7.

*-Table 7 near here-*

#### **4. Conclusions and Implications**

This study sought to observe the influence of customers' TR, as a personality variable related to technology usage, on their intentions to purchase their next travel by mobile phone. In this sense, we propose TR as a variable that extends the TPB for settings related to customers' m-purchases. This approach offers several contributions to service research. First, we apply the TPB to m-purchases of travel, a context in which we have not found any prior research that takes a similar tactic. Second, considering TR in a mobile context expands its application, beyond online or more global self-service technologies. Third, we incorporate the effect of customers' attitudes toward m-advertising on their m-purchase of travel, because we consider it a fundamental element in the early stage of technology adoption. In these ways, this study is both unique and relevant for m-commerce literature and analyses of travellers' behaviour. We thus reveal a sustained, logical sequence for improving the theory and gaining a better understanding of customers' intentions to purchase using their mobile phones. If we assume that the

foundation for customer behaviour theory is the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), which was expanded to the TPB, our proposal for an extended TPB with TR offers a wider perspective on online customers' behaviour, including and confirming the effects of personality characteristics on travellers' decision to purchase travel-related services through mobile phones.

The empirical results suggest a positive effect of customers' TR on perceived control and subjective norms related to mobile travel purchases; they also indicate a positive effect of subjective norms on customers' intentions to purchase travel using their mobile phones. Therefore, a person who is more technologically ready is more prone to perceive control and to influence other parties' views, which exert further social impact on their m-purchases of travel. Customers who perceive themselves as capable and prepared to use the mobile phone for purchasing travel sense higher control over the actual use of that technology. Then the technologically ready travellers transmit their positive views to other people in their environment. Once they accomplish goals, travellers come to feel even more confident about their TR, which they perceive as approved by others. When a person is more optimistic, more prone to innovations and less likely to perceive insecurity associated with mobile technology usage, it enhances her or his perception of what other socially relevant people (e.g., friends, family, colleagues) think of her or his capabilities. Furthermore, these subjective norms serve as an incentive to purchase travel by mobile phone. Moreover, customers' TR positively influences their intention to purchase a travel using a mobile phone. However, discomfort, as an element of TR, is not a pertinent influence, a finding that aligns with some previous research (Parasuraman, 2000; Lam, Chiang, & Parasuraman, 2008).

We also find that TR does not influence customers' attitudes toward m-advertising, nor does this attitude influence customers' intentions to purchase by mobile phone. We predicted this effect as a direct antecedent of customers' m-purchase intentions (Watson et al., 2013), critical for the initial phases of m-commerce, with the sense that customers might still have doubts about m-purchases or lack previous experience with them. Besides, even though m-advertising by the companies is permission-based, to which customers previously have consented, it still highlights privacy issues, which may influence associated behaviours (Richard & Meuli, 2013). But even if this reasoning does not hold, customer-based drivers still might not be significant (Bauer et al., 2005). In the case of travel-related services, the decision-making process involves personal experiences, individual feelings, emotional reactions and behavioural responses related to the travel and destination (Zhang, Fu, Cai, & Lu, 2014)—all aspects that could interfere with the relationships we depict.

Moreover, we did not include other factors that might affect customers' receptiveness to m-advertising or intentions to carry out m-purchases, such as their attachment to their mobile devices or the interactivity of the mobile site (Watson et al., 2013). A customer who is apprehensive about using a technology and assigns little value to a task is unlikely to undertake an online travel purchase for example (Amaro & Duarte, 2013). In addition, customers' attitudes toward m-advertising are conditioned by the relevance of the advertising (Leppäniemi & Karjaluoto, 2005). Thus, even if customers lack other concerns about the technology or m-advertising, if they perceive the m-advertising as irrelevant, it might affect their related attitudes and behaviours.

A similar situation arises with regard to customers' perceived control; we find that a person who perceives more control over mobile phone usage does not necessarily exhibit greater intentions to purchase travel using this device. This finding reflects results pertaining to Spanish online travel consumers (Bigné, Sanz, Ruiz, & Aldás, 2010), and it may be explained by noting that m-purchases of travel services require customers' high-involvement, self-reliance, confidence and convenience. Without all these factors, they likely show a general reluctance to purchase travel by mobile phone (Keramati, Taeb, Larijani, & Mojir, 2012; Park & Huang, 2017). Thus, a person might perceive control but still not be prepared to purchase, due to the uncertainty associated with not having conducted an m-purchase previously or the potential risk of making a mistake.

As Ajzen (1991) argues, the influence of the three independent variables of the TPB on customers' intention can vary due to relations with a particular context or situation. Similarly, different segments of customers manifest varying degrees of the four TR dimensions, such that they enter markets at different moments (Massey et al., 2007). In this sense, the 'TR typology describes market penetration regarding the progression in the types of customers the market attracts' (Massey et al., 2007, p. 282). This reasoning could explain why some TR factors have less impact on customers' behaviours related to m-purchases of travel.

Some useful managerial implications also emerge from our findings. To increase intentions to purchase travel using mobile phones, companies should pursue technologically ready customers, who can be identified by their high propensity to use new technologies, great optimism and a strong tendency to innovate. They also do not perceive much insecurity surrounding the use of mobile phones. As previously indicated

(Walczuch et al., 2007), technologically ready, optimistic customers have positive attitudes about their success in fulfilling tasks and perceive the functionality and usefulness of mobile technologies. They employ a variety of new technologies, not only in e- and m-commerce activities but during traditional purchase occasions too. Therefore, companies might employ global systems for mobile communications (Yılmaz & Olgaç, 2016) to identify technologically ready customers, then trigger greater intentions to engage in m-purchases among these consumers.

Technologically ready customers do not worry about possible negative outcomes in an unknown situation and perceive innovations as reliable, which gives them more security. To provide services in an atmosphere that stimulates m-purchases and enhances consumers' experiences, companies might turn to Near Field Communication (NFC) to establish a comfortable, secure way to undertake a purchase (Liébana-Cabanillas, Muñoz-Leiva, & Sánchez-Fernández, 2017). With NFC, consumers can conduct fast, easy scanning of an identification code, thereby completing an electronic transaction with only their mobile phones. This innovative technology for mobile payment currently is growing in terms of its implementation by service companies.

However, for customers who are not technologically ready, companies should offer applications to simplify the purchase process, so even if these consumers lack effective skills with new technologies, they still find the action easy to implement. Furthermore, companies must regularly update the information they provide, such as Frequently Asked Questions (FAQ) pages, to reflect the nearly technological changes. To give customers clear information about the system's security, privacy and data management, companies might provide video tutorials on technology and privacy principles, in an easy-to-

understand format. Supporting quick contacts with and full information about the company also may help customers feel more confident about its continued existence. Data-centred platforms and security systems solutions could help identify customers' security concerns and resolve them timely and effectively (Keller, Möhring, Toni, Di Pietro, & Schmidt, 2016).

As consumers gain more technological readiness, they likely propagate the value and usefulness of m-purchases, which might help companies attract new and maintain existing customers. Thus, a more comfortable environment would emerge, providing technical support that customers can understand easily, such that they would not feel uncomfortable or judged due to their lack of knowledge. Moreover, to target these customers and capture new ones, companies could encourage opinion leaders, using personal testimonials, or establish mobile forums to allow customers to discuss issues or concerns they have. To identify customers who might be less technologically ready, companies should monitor customers' feedback, then try to enhance their optimism and innovativeness dimensions, perhaps by adapting or customising operational functions (Wong et al., 2016). A practical way to accomplish all these outcomes would be to employ Customer Relationship Management (CRM) systems (Rahimi, Köseoglu, Ersoy, & Okumus, 2017) and offer solutions and further customer service through social media such as Twitter (Gunarathne, Rui, & Seidmann, 2017).

Finally, since generation Y is deeply involved in m-purchases and engaged in travel planning (Xiang et al., 2015), companies should use various channels (e.g., social networks, chats, blogs) to distribute their service offers, directly or indirectly through these younger generations, to expanded audiences of consumers. Thus, customers would



be in continuous contact with the company and aware of its activities, and they could easily return to the same mobile app or site to repeat their travel purchases. This communication strategy also will help customers enhance their skills and capacities, then transmit them to others in their social network, which might influence the image formed about customers' purchase of travel by mobile phone.

One of the *limitations* of this study is that it encompasses a relatively small sample of Spanish customers and refers solely to the travel sector, which limits the generalisability of the findings. As previously established (Oh, Yoon, & Chung, 2014), the influence of TR could vary across cultures; further research, therefore, should conduct a comparison of Spanish m-customers' purchasing activity with those of other countries. Replicating the proposed model could reveal similarities or differences across other European countries with similar levels of digitalisation progress, such as Malta, Lithuania or Portugal, following their Digital Economy and Society Index points (ONTSI, 2016; European Commission, 2017). It also would be interesting to analyse differences across customers who indicate varying levels of online or m-purchase experience, such as first-timers versus experienced buyers, and to consider the specific device and app they use for their purchases. Along these lines, a novel contribution might distinguish customers according to Rogers's (2010) classification (i.e., innovators, early adopters, early majority, late majority and laggards). Additionally, there is lack of information in this study regarding the type of travel-related services purchased in the past. Therefore, detailed data about previous purchases could be gathered in future, so that a deeper understanding can be obtained of customers' purchasing habits and the effect of their

earlier practices, so that anticipation of future travel-purchase intentions could be projected.

As another limitation, not all our hypotheses received support. Additional research might include other variables, such as customer skills or self-efficacy, to predict adoption behaviours in mobile contexts. Studies also might consider the role of trust and the risk that customers perceive regarding mobile technology, then explore their effects on customers' behaviours. Likewise, m-advertising attitudes might be investigated more precisely, such as in relation to the permission-based mobile marketing activities of a particular travel website. Finally, to improve the reliability and consistency of the TR construct, it would be helpful to investigate the separate influences of the four TR dimensions on the rest of the variables in the model.

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**Table 1. Relevant variables in customer mobile purchase behaviour research**

<b>Studied variables</b>	<b>Approach and authors</b>	<b>Description</b>	<b>Application to customer behaviour research in mobile purchase context</b>
<b>Perceived usefulness and perceived ease of use.</b>	<i>Technology Acceptance Model (TAM), Davis (1989)</i> <i>TAM2, Venkatesh and Davis (2000)</i> <i>TAM3, Venkatesh and Bala (2008)</i>	Precisely two factors influence customer decision about how and when they will adopt and use a technology: perceived usefulness and perceived ease of use.	Duane, O'Reilly and Andreev (2014); Yan and Pan (2015); Kalinic and Marinkovic (2016); Chen, Hsu and Lu (2017); Shang and Wu (2017).
<b>Perceived control, attitude and subjective norms.</b>	<i>Theory of Planned Behavior (TPB), Ajzen (1991)</i>	Customers' attitude toward behaviour, subjective norms, and perceived behavioural control together shape individuals' behavioural intentions and behaviours.	Yang (2012); Zhong (2013); Mishra (2014); Hongyan and Zhankui (2017); Lombardi et al. (2017).
<b>Performance expectancy, effort expectancy, social influence and facilitating conditions.</b> <b>Gender, age, experience and voluntariness of use (moderating variables).</b>	<i>Unified Theory of Acceptance and Use of Technology (UTAUT), Venkatesh, Morris, Davis and Davis (2003)</i> <i>UTAUT2, Venkatesh, Thong and Xu (2012)</i>	The new technology adoption is a consequence of customer usage behaviour determined by their intentions to use a new technology.	Yang (2010); Yang and Forney (2013); Teo, Tan, Ooi and Lin (2015); Khalilzadeh, Ozturk and Bilgihan (2017); Lu, Yu, Liu and Wei (2017).

Note: The list of sources is not exhaustive to include all the existing studies, yet it reflects the most relevant ones for the purpose of this research.



**Table 2. Fact sheet**

<b>Characteristics</b>	<b>Questionnaire</b>
<b>Population statistics</b>	Internet buyers of both genders, older than 18 years of age, inhabitants of Spain, that have purchased online a travel at least once in the last year and that have an intention to purchase a travel through a mobile phone
<b>Geographical field</b>	Spain
<b>Sample size</b>	220
<b>Sampling error</b>	$\pm 6.61\%$ (confidence level of 95.5%)

**Table 3. Sample characteristics**

<b>Demographical characteristics</b>	<b>%</b>
<b>Gender</b>	Men
	46
	Women
	54
<b>Age</b>	18-24
	10.5
	25-34
	52.3
	35-44
	21.3
	45-54
<b>Education</b>	12.3
	55-64
	3.1
	> 64
	0.5
	Basic studies
	1.8
<b>Monthly home income</b>	High school/ Associate degree
	16.9
	University degree
	43.4
	Postgraduate/PhD
	37.9
	$\leq 900\text{€}$
	16.4
	901 to 1200€
	13.6
	1201 to 1500€
	15.9
	1501 to 2000€
	17.7
	2001 to 3000€
	18.2
	3001 to 4000€
	9.6
	> 4000€
	8.6

**Table 4. First-order measurement model for TR estimation**

<b>Latent variable</b>	<b>Dimensions</b>	<b>Lambda Coefficient (<math>\lambda</math>)/ t Value</b>
<b>Optimism</b>	Technology gives me more control over my daily life.	.975/17.315
	Technology gives me more freedom of mobility.	1.000/-
	It is much more convenient to buy trips using the new technologies.	.616/9.667
<b>Innovativeness</b>	Other people come to me for an advice on new technologies.	.969/15.891
	In general, I'm among the first in my circle of friends to acquire new technology when it appears.	1.000/-
	I can figure out new high-tech products and services without help from others.	deleted
<b>Discomfort</b>	Technical support lines are not helpful because they don't explain things in terms that I understand.	.486/6.406
	When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I was being taken advantage of by someone who knows more than I do.	1.000/-
	It is embarrassing when I have trouble with a high-tech gadget while people are watching.	deleted
<b>Insecurity</b>	I do not feel confident doing business with a place that can only be reached online.	.780/10.787
	I do not consider it safe giving out a credit card number over a computer.	1.000/-
	Any business transaction I do electronically should be confirmed later with something in writing.	.503/7.020

Note:  $\chi^2=77.206$  ( $p=0.000$ ); RMSEA=0.0782; NFI=0.90; CFI=0.934; IFI=0.935; RFI=0.862; GFI=0.928.

**Table 5. Second-order measurement model estimation**

<b>Latent variable</b>	<b>Dimensions</b>	<b>Lambda Coefficient (<math>\lambda</math>)/ t Value</b>
<b>TR</b>	Optimism.	.621/9.504
	Innovativeness.	1.000/-
	Discomfort.	-.020/-0.275
	Insecurity.	-.269/-3.789
<b>Attitude towards m-advertising of travel</b>	I find mobile advertising messages of travels exciting.	.873/20.213
	I find receiving advertising messages of travels via mobile phone positive.	1.000/-
	I appreciate receiving advertising messages of travels via mobile phone.	.934/23.939
<b>Perceived control</b>	I have a profound knowledge about mobile communications.	.870/17.584
	In comparison to my circle of friends, I am an expert in mobile communications.	1.000/-
	In my circle of friends, I am usually the first who knows about the latest mobile phones.	.735/13.200
<b>Subjective norms</b>	If I purchased a trip by mobile phone, most of the people important to me would regard me as clever.	.822/14.586
	If I purchased a trip by mobile phone, most of the people important to me would regard the trips purchase by mobile phone as useful.	.918/17.130
	If I purchased a trip by mobile phone, most of the people important to me would regard the trips purchase by mobile phone as valuable.	1.000/-
<b>Intention to purchase</b>	My general intention to purchase a trip by mobile phone is very high.	1.000/-
	I will consider buying a trip using a mobile phone.	.876/13.036
	Next time I purchase a trip, if it is possible, I will do it using a mobile phone.	deleted

Note:  $\chi^2=163.781$  (p=0.000); RMSEA=0.0651; NFI=0.927; CFI=0.963; IFI=0.963; RFI=0.909; GFI=0.905.

**Table 6. Correlation matrix of the second-order model**

	TR	IP	PC	SG	AMA
TR	1.000				
IP	0.471	1.000			
PC	0.806	0.383	1.000		
SG	0.537	0.461	0.542	1.000	
AMA	0.038	0.037	0.091	0.090	1.000

Note: TR=Technology readiness; IP=Intention to purchase; PC=Perceived control; SG=Subjective norms; AMA=Attitude towards m-advertising.

**Table 7. Second-order structural model estimation and control variables**

<b>Hypothesised relations</b>		<b>Coefficient <math>\beta</math> (t Value)</b>	<b>Result</b>
H1: Subjective norms	→ Intention to purchase	0.276 (3.202)**	Supported
H2: Perceived control	→ Intention to purchase	- 0.0479 (-0.381) <sup>ns</sup>	Rejected
H3: Attitude towards m-advertising	→ Intention to purchase	- 0.0131 (-0.0203) <sup>ns</sup>	Rejected
H4: Technology readiness	→ Attitude towards m-advertising	0.0480 (0.604) <sup>ns</sup>	Rejected
H5: Technology readiness	→ Perceived control	0.803 (13.149)**	Supported
H6: Technology readiness	→ Subjective norms	0.471 (6.703)**	Supported
H7: Technology readiness	→ Intention to purchase	0.332 (2.277)*	Supported
<b>Control variables</b>		<b>Coefficient <math>\beta</math> (t Value)</b>	
Gender	Gender → Intention to purchase	- 0.0328 (-0.544) <sup>ns</sup>	
Age	Age → Intention to purchase	- 0.0662 (-1.093) <sup>ns</sup>	
Type of travel	Type of travel → Intention to purchase	0.0162 (0.268) <sup>ns</sup>	
Online purchase experience	Online purchase experience → Intention to purchase	- 0.128 (-2.060) <sup>ns</sup>	
Online purchase frequency	Online purchase frequency → Intention to purchase	- 0.0567 (-0.933) <sup>ns</sup>	
Involvement in the online purchase	Involvement in the online purchase → Intention to purchase	- 0.204 (-3.163) <sup>ns</sup>	
Expenses on online travel purchase	Expenses on online travel purchase → Intention to purchase	- 0.0953 (-1.570) <sup>ns</sup>	
<b>Goodness of fit: <math>\chi^2=199.858</math> (p=0.000); RAMSEA=0.0623; NFI=0.922; CFI=0.969; IFI=0.969; RFI=0.924; GFI=0.902;</b>			

Note: \*\*p<0.001; \*p<0.05; ns=not significant.

