

Perceived value of advanced mobile messaging services

A cross-cultural comparison of Greek and Spanish users

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Abstract

Purpose – The purpose of this paper is to analyse the role of perceived value on post-acceptance behaviour for users of advanced mobile messaging services (AMMS). The paper also compares differences in the influence of perceived value on satisfaction and of satisfaction on loyalty to AMMS in Spain and Greece, to test the moderating effect of culture.

Design/methodology/approach – Partial least squares path modelling is used to test the model. Perceived value is modelled as a multidimensional reflective construct with four dimensions. Culture is studied at a national level. Differences between countries are tested using the multigroup analysis approach proposed by Henseler *et al.* (2009).

Findings – Perceived value contributes significantly to satisfaction. Satisfaction also has a significant effect on loyalty. Regarding the moderating effect of culture, the influence of perceived value on satisfaction is higher in Greece than in Spain. The authors report similar findings for the effect of satisfaction on loyalty, demonstrating the relevant moderating role of cultures with different degrees of masculinity, uncertainty avoidance and collectivism.

Practical implications – This cross-cultural comparison enables mobile phone companies to understand how to provide the greatest value with AMMS in each country in order to increase user satisfaction and loyalty to the service.

Originality/value – This is one of the first studies that develops cross-cultural research to analyse the post-acceptance of mobile services. It analyses the effect of perceived value and satisfaction, making an original comparison of two countries generally considered too similar to be compared.

Keywords Cross-cultural issues, Customer satisfaction/service, Post-implementation, Cross-national study, Mobile communications, Service quality (SERVQUAL)

Paper type Research paper

1. Introduction

The mobile phone industry is regarded as one of the most important sectors, not only in the communications field but also in the economy as a whole, contributing 2 per cent of global gross domestic product in 2011. The worldwide penetration rate was over 95.5 per cent by the end of 2014 with more than 6.9 billion mobile subscriptions, for a growth rate of 8 per cent since 2005 (International Telecommunication Union, 2014). The mobile phone industry is now reaching the mature stage in its lifecycle, with an increasing number of mobile service operators and declining traditional voice service revenues (Jin and Von Zedtwitz, 2008; Kuo and Yen, 2009; Rudd, 2010). Therefore, in order to enhance their profits,

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mobile service operators need to retain customers and steal market share from their competitors, providing new services and applications with greater value for users (Kuo *et al.*, 2009; Borges *et al.*, 2015).

Most research on mobile services is focussed on cognitive processing inherent to the individual's initial use, testing behavioural models such as the technology acceptance model (TAM) and the theory of planned behaviour (TPB) (Lippert and Volkmar, 2007; Yang and Jolly, 2009; Muk, 2012; Muk and Chung, 2015). These models study perceptions related to the intrinsic attributes of the technology (usefulness, ease of use, etc.) and explain the individual's acceptance. Nevertheless, they do not take into account what happens after acceptance and which factors come into play when the individual already uses and knows the mobile service (Varnali and Toker, 2010; Al-Debei and Al-Lozi, 2014; Wang, 2015).

In the era of smartphones, acceptance of mobile services is overcome, so research should address which factors determine the individual's behaviour during the post-acceptance stage. During this stage, individuals' choice whether they reverse or continue using the mobile service and, therefore, whether they are loyal towards the service. Perceived value is crucial to the continuance of the service and has become a very interesting source of competitive advantage since it is one of the main determinants of payment intentions (Deng *et al.*, 2010; Hsiao and Chen, 2016).

In the last years, several mobile value-added services have been developed. They are defined as services beyond traditional voice calls and short messaging services that are accessible from mobile devices and can be either self-produced by mobile service operators or provided by application and content developers (Kuo *et al.*, 2009; Tojib and Tsarenko, 2012; Wang and Lin, 2012). These services enable customers to communicate with other parties, seek pleasure, perform transactions and obtain information, offering an abundance of opportunities and potential revenue streams (Ahn *et al.*, 2011; Gummerus and Pihlström, 2011). They include games, ringtones, graphics, photos, messaging services, mobile commerce, mobile banking, location-based services, news and web browsing (Kuo *et al.*, 2009; Tojib and Tsarenko, 2012; Wang and Lin, 2012).

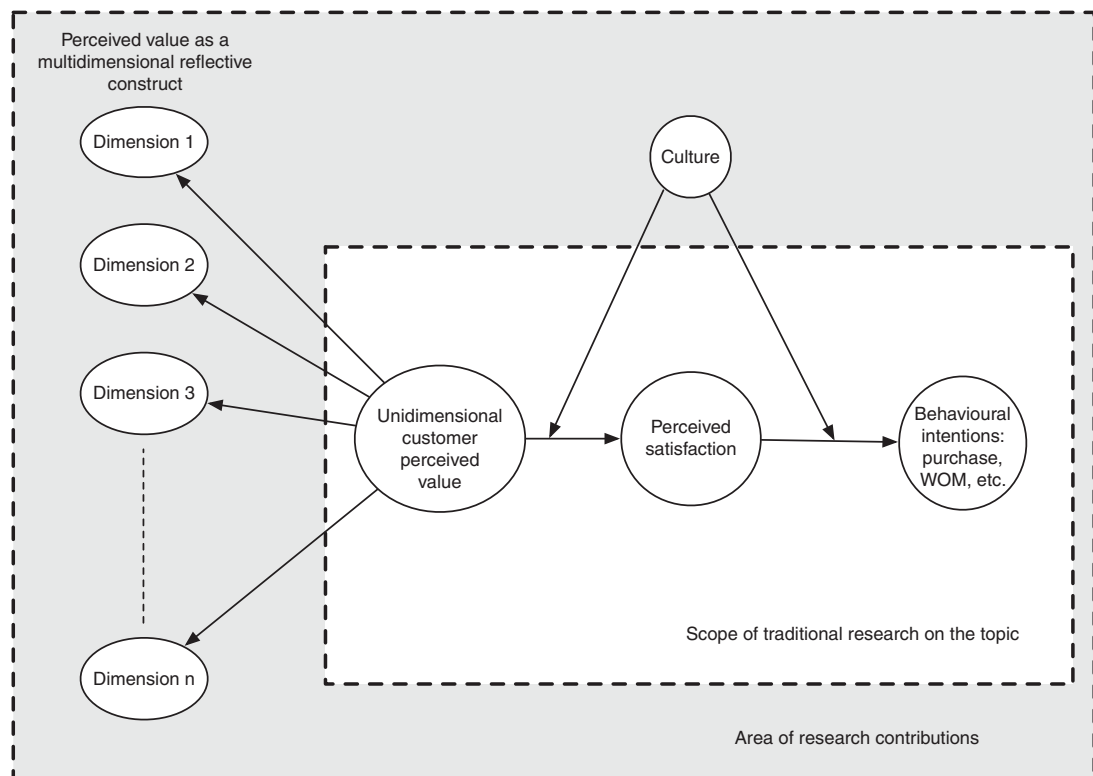
Advanced mobile messaging services (AMMS) are one of the most varied and promising value-added services, due to new trends in communication and the possibilities offered by smartphones. AMMS can operate with 3G and 4G mobile telecommunication networks, involve communication and network access services, and can be provided through different applications (e.g. WhatsApp, Viber or Telegram). AMMS include premium multimedia message services, videophone message services, instant mobile messaging and mobile chat, among others. They allow users to conduct ubiquitous interactions, both as a peer-to-peer channel and as a conferencing platform, achieving personal, versatile and expressive communications (Bones *et al.*, 2007; Hsu *et al.*, 2007). AMMS are having an increasing impact on users' lives because they offer information and entertainment (Kim *et al.*, 2010). Despite the potency of AMMS, these services have not spread homogeneously throughout the world and mobile service providers still lack understanding of how value is constructed from a customer value creation perspective (Gummerus and Pihlström, 2011).

The growing tendency of markets towards globalization is making the influence of culture critical, especially in internationalized sectors like the mobile phone industry. Mobile service operators should be aware of the cultural characteristics of each market in which they wish to compete because these characteristics may be the source of differences in the customers' usage of the services offered. According to Varnali and Toker (2010), who developed a meta-analysis on mobile marketing, cross-cultural research is still scarce. Straub *et al.* (1997) and Sun and Zhang (2006) share this opinion. They consider that global mobile marketing strategy focussed on a single country is imprudent, and establish that further analyses are needed to improve understanding of the effects of cultural dimensions on user behaviour. Most cross-cultural studies on information technologies (ITs) has centred

on very different cultures, like China and the USA (Pavlou and Chai, 2002) or Korea and the USA (Dinev *et al.*, 2009). Differences between apparently similar European countries, such as Spain and Greece, have scarcely been studied. For this reason, mobile operators that direct their services to these countries have generally made very little effort to adapt their offering, assuming that services can be standardized. But, if adoption and usage are different, can cultural effects be neglected or, as Yang and Jolly (2009) point out, is culture the basis of this different behaviour?

The main objective of this study is twofold. First, we will determine the influence of satisfaction on user's loyalty towards AMMS, as well as the effect of perceived value on satisfaction during the post-acceptance stage. Second, we will analyse the differences in users' behaviour depending on their culture. We study the moderating effect of national culture and simultaneously test the proposed model in two different countries, Spain and Greece (see also Lee *et al.*, 2002; Yang and Jolly, 2009). Likewise, we will check whether the user's loyalty is not only affected by his/her perceptions of value and satisfaction during the use of services, but also by his/her norms and beliefs derived from his/her nationality (Triandis, 1989).

This paper contributes in two ways (see Figure 1). First, it addresses the appeals for additional research that generalizes mobile services employment across countries by examining the influence of national culture (Gummerus and Pihlström, 2011). This cross-cultural comparison will allow us to better understand the success and effectiveness of mobile services. As Sun and Zhang (2006) and Varnali and Toker (2010), among others, point out, the cultural incongruence impacts users' behaviour and limits the external validity of many papers on mobile marketing. Each country has its unique characteristics (Wallace *et al.*, 2013) and users perceive mobile benefits through their own culture (Steer *et al.*, 2008). Therefore, users from different countries are likely to experience different value derived from the employment of AMMS. The contextualization of the model incorporating the moderating effect of culture



that conditions perceived value, satisfaction and loyalty is fundamental, since it helps to understand user's behaviour and to develop differentiated marketing value strategies for each country, according to national features.

Second, this paper goes beyond the traditional approach of research on mobile services, which is based on behavioural models and initial use, studying the individual's post-acceptance behaviour. So, it deals with the user's evaluation of value derived from the AMMS employment and determines his/her satisfaction and loyalty. This approach will contribute to a deeper understanding of mobile services since it focusses on value perceptions to explain the service long-term use. To study value perceptions, we propose a broader decomposed view of multidimensional value that includes emotional, social and performance components. All these components covary with one another to form AMMS perceived value, so we incorporate a reflective formulation and propose that they jointly influence user satisfaction.

Figure 1 shows, in the white area, an example of a traditional approach of academia to analysing perceived value in the services arena (e.g. Yang and Peterson, 2004; Ryu *et al.*, 2008; Kuo *et al.*, 2009) and differentiates, in the shadowed area, the novelty and main contributions of the present study.

2. Theoretical framework

In mobile services field, research on acceptance has been a dominant subject. Behavioural models that emerged during the 1980s and 1990s, such as TAM and TPB, have been widely applied to explain the effect of individual's perceptions on technology acceptance (Lippert and Volkmar, 2007; Yang and Jolly, 2009; Muk, 2012; Muk and Chung, 2015). Nevertheless, mobile services have evolved and individuals use them regularly, developing continued use and loyalty. Nowadays, studying exclusively the acceptance of mobile services leads to a partial view of user behaviour, since it ignores the relevance of other factors that may influence the individual after experiencing the characteristics of the service. Therefore, the current mobile context requires the development of theoretical frameworks that analyse post-acceptance behaviour derived from the individual's value perceptions.

We can highlight three main theoretical grounds that have been utilized to study the post-acceptance behaviour. The first is the expectation-confirmation theory, where factors tested to explain the individual's initial use are generally extended to analyse post-acceptance behaviour (Oliver, 1980). This theory shows the limitation that it studies a limited number of post-acceptance factors. The second is the information systems (IS) success model (DeLone and McLean, 1992). It tries to identify components of IS success and considers six interdependent variables: system quality, information quality, use, user satisfaction, individual impact and organizational impact. This model is naturally dependent and should be applied on the organizational context (Petter *et al.*, 2008). The third theoretical ground is based on consumer value theories, which claim that value perceptions are the pivotal predictors of loyalty, attitudes and behaviours after consumption (Sweeney and Soutar, 2001; Han, 2015; Kim *et al.*, 2016). For ITs, these theories consider that the acceptance behaviour differs from the post-acceptance behaviour since the former is derived from individual's impressions while the latter depends on individual's own experiences. After evaluating characteristics and requirements of these theoretical grounds, we build our model to study AMMS according to the customer perceived value stream.

2.1 Customer perceived value

The concept of customer value is an increasing concern for consumers, practitioners and researchers because it is one of the most powerful forces in today's marketplace (Albrecht, 1992; Ryu *et al.*, 2008). Nevertheless, despite its wide interest, there is no single unanimously accepted definition of customer value because the concept is multi-faceted

and complex. Economic disciplines define value as the difference between the consumer's willingness to pay and the actual price paid, which is equal to the consumer's surplus, that is, the excess value retained by the consumer (Hinterhuber, 2004). Other studies on new product development, however, refer to customer value provided by a breakthrough product which distinguishes it from its predecessors and followers (Cagan and Vogel, 2002).

In the marketing literature, initial conceptualizations of value emphasized price perceptions through a single overall value factor (Thaler, 1985; Patterson and Spreng, 1997). They apply a rational and cognitive perspective focussed on acquisition and transaction value (Gutman, 1982; Monroe, 1990; Dodds *et al.*, 1991), analysing "fair price" or "value for money" (Grewal *et al.*, 1998) and ignoring other non-monetary questions (Baker *et al.*, 2002). In this context, one of the more popular proposals is that of Zeithaml (1988), who define value as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given". In mobile research, this unidimensional (first-order) approach has been widely applied; see for example, Lai (2004) for SMS, Kuo *et al.* (2009) for mobile value-added services and Kim *et al.* (2013) for mobile user engagement.

Although the unidimensional approach to value is effective, it cannot discern the complex nature of the concept based on the perceived customer benefits and sacrifices (Lapierre, 2000; Lin *et al.*, 2005). In an attempt to avoid this limitation, some authors suggest multidimensional approaches that address value generators connected to consumption and linked to affective, emotional and experiential factors (Holbrook, 1994; Mattson, 1992; Sweeney and Soutar, 2001). They consider that value perceptions not only serve as the basis for a purchase decision but are also the result of a particular consumption experience, that is, value in use. Therefore, these perceptions may differ according to consumer needs, preferences and financial resources, depending also on the usage situation (Ravald and Grönroos, 1996; Pura, 2005). This approach is followed by the utilitarian and hedonic value theory (Babin *et al.*, 1994), the consumption-values theory (Sheth *et al.*, 1991) and the typology of consumer value (Holbrook, 1996, 1999). Thus, there are several proposals regarding the components that define the concept of customer value (e.g. de Ruyter *et al.*, 1997; Heinonen, 2004).

In the mobile services arena, recent studies on perceived value are complementing the traditional functional/cognitive approach with other hedonic/affective components (Pura, 2005; Turel *et al.*, 2007; Deng *et al.*, 2010). They consider that both kinds of components may be interrelated so that perceived value should be defined as a multidimensional factor made up of several correlated components derived from the consumption experience. Following them, we focus on the Sweeney and Soutar's (2001) framework because its scale of value, known as PERVAL, involves functional, experiential and monetary aspects of the service consumption, ignoring other non-significant components that previous research had considered. This framework tries to define a sophisticated measure to understand how consumers value products and services, after his/her consumption and/or employment. Sweeney and Soutar's (2001) framework is characterized by its functionality and parsimony, and it has been validated by several authors in different contexts (e.g. Turel *et al.*, 2007; Walsh *et al.*, 2014). Specifically, this framework is one of the most common approaches applied to analyse value for mobile services (e.g. Hsu and Lin, 2015 for paid mobile apps and Deng *et al.*, 2010 for mobile instant messages). Therefore, we propose that perceived value comprises four dimensions: emotional, social, cost-benefit and quality-performance value.

Emotional value refers to the feelings or affective states generated by the service (Sweeney and Soutar, 2001), and usually reflects the enjoyment associated with its use (Turel *et al.*, 2007; Yang and Lin, 2014). It contains the hedonic view of consumption (Holbrook and Hirschman, 1982). Social value is related to the utility of the service to connect people and improve social self-concept and self-image among other individuals

(Sweeney and Soutar, 2001; Yang and Lin, 2014). Cost-benefit value expresses the utility derived from use of a service as a result of the cost, time or effort spent in the short or long term (Sweeney and Soutar, 2001; Turel *et al.*, 2007). Finally, quality-performance value refers to the expected performance of using a service.

Compared to other mobile value-added services, AMMS require communication between at least two users, allowing them to express their personality, participate in conversations and share their experiences. These services are inter-personal in nature so include a socialization perspective that may increase the customer's overall perceived value (Tojib and Tsarenko, 2012). Users can also interchange funny texts, photos, music and files so they feel positive emotions that generate recreational and experiential value (Rouibah, 2008; Gummerus and Pihlström, 2011; Al-Debei and Al-Lozi, 2014). The cost-benefit value dimension is especially relevant for IS, in general, and for mobile services, in particular, since economic considerations are traditionally described as the main reason for individual decisions to adopt and use them (Yang and Jolly, 2009; Deng *et al.*, 2010; Lin and Lu, 2011). Finally, quality-performance value of AMMS refers to the practical or technical benefits that users can obtain when using them, including convenience, immediacy and ubiquity, among others.

Prior research and the original proposal made by Sweeney and Soutar (2001) state that the hedonic and utilitarian components of attitude are interrelated (e.g. Osgood *et al.*, 1957). Accordingly, we consider that these dimensions must be included and interrelated when we define perceived value, establishing that this construct must be defined as a second-order reflective latent variable. For example, users can employ AMMS to send interesting pictures or jokes to their environment, which allow them to communicate with their friends anytime and anywhere (functional value), have fun (emotional value) and improve their social relationships (social value). Therefore, these dimensions are almost interchangeable and form a high-order factor with a reflective structure (Chen and Lin, 2015). We define perceived value as the consumers' overall assessment of the four dimensions of AMMS based on perceived benefits and costs, which are separate but not independent and should be correlated (Sweeney and Soutar, 2001). Likewise, according to MacKay (1999, p. 182), we can state that value derived from the employment of AMMS is an "amalgam of rational and emotional factors" that forms a critical building block in the development of relationships (Kashani and Kasmani, 2015).

2.2 Consequences of perceived value: satisfaction and loyalty

Perceived value has been revealed as an important concept that predicts customer behaviour, influencing outcomes such as customer satisfaction, purchase intentions, word-of-mouth and loyalty (Lam *et al.*, 2004). As long as a product or a firm provides superior value, customers feel satisfaction with it, increase their willingness to buy and decrease their intention to search for alternatives (Hellier *et al.*, 2003; Pura, 2005). Therefore, perceived value has become the cornerstone in every marketing activity (Holbrook, 1994, 1999). Our research focusses on customer satisfaction and loyalty as the main consequences of perceived value.

Customer satisfaction is defined as "the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience" (Oliver, 1981). If consumers have good experiences with a product or service, they will be satisfied and will tend to use the product or service in future. Nevertheless, several studies about mobile services have found that satisfied consumers also switch to another service or operator for reasons other than dissatisfaction, such as looking for lower costs or better attributes and performance – in fact, perceived value components – (Polo and Sese, 2009). For this reason, mobile service operators are shifting their marketing efforts from pure satisfaction with the service to loyalty cultivation (Varnali and Toker, 2010). The joint study of these concepts is relevant for understanding customer behaviour, trying to achieve customer retention and long-term

relationships (Ganesh *et al.*, 2000). For AMMS, service loyalty refers to the user's intention to continue using this service in the future and recommend it to other individuals (Zeithaml *et al.*, 1996; Lam *et al.*, 2004). Service loyalty is a major source of sustained growth and profit since loyal customers are more willing to pay higher prices, tend to be more tolerant of problems in service performance and are usually willing to recommend through word-of-mouth communication (Reichheld and Scheffer, 2000; Gefen, 2002). Therefore, retaining existing customers and strengthening customer loyalty appear to be crucial for mobile service providers to gain competitive advantage.

Satisfaction has traditionally been considered a key antecedent of loyalty because it acts as a mediator of many other independent variables (Lam *et al.*, 2004; Anderson and Swaminathan, 2011). Satisfied customers use the product more than those who are not satisfied, they recommend it to their friends and relatives, and possess stronger intentions to purchase and consume it again (Zeithaml *et al.*, 1996; Liao *et al.*, 2009). If a service can satisfy customer needs better than other alternatives, their switching intentions decrease, and their loyalty improves (Choi *et al.*, 2008). So, most researchers consider loyalty to be the natural consequence and the ultimate objective of satisfaction (Homburg and Giering, 2001; Deng *et al.*, 2010). Nevertheless, it should not be forgotten that this relationship has not been always demonstrated, since customers' comparisons between the results obtained with a service and those offered by alternative providers can induce them to change despite their initial satisfaction (Thibaut and Kelley, 1959). Moreover, few studies have investigated the linkage between satisfaction and loyalty in the context of mobile telecommunications (Aksoy *et al.*, 2013). For these reasons, we consider it essential to test this relationship in the field of AMMS. Following the consistent evidence that has proved the positive and significant effect of customer satisfaction on loyalty for several mobile services (Deng *et al.*, 2010; Zhao *et al.*, 2012; Chang, 2015), we propose that:

H1. User satisfaction with AMMS positively influences loyalty towards them.

As we have already explained, perceived value has traditionally been considered an antecedent of satisfaction (Caruana *et al.*, 2000; Babin and Kim, 2001; Oh, 2003). The relationship between them is explained attending to the cognitive/affective nature of both concepts. Cognitive orientation always precedes affective orientation (Bagozzi, 1992), so the traditional consensus is that the cognitive nature of perceived value determines the cognitive/affective nature of satisfaction (Zeithaml, 1988; Anderson and Sullivan, 1993; Ostrom and Iacobucci, 1995; Oliver, 1999).

The relationship between perceived value and satisfaction has been also tested in research on online shopping websites and e-commerce (Yang and Peterson, 2004; Hsu, 2006), as well as in studies about mobile services (Lin and Wang, 2006; Turel and Serenko, 2006; Kuo *et al.*, 2009). Likewise, Lin and Wang (2006) show that consumer satisfaction mediates the relationship between perceived value and loyalty for mobile e-commerce in Taiwan. Similarly, Turel and Serenko (2006) for mobile services, Kuo *et al.* (2009) for mobile value-added services, Deng *et al.* (2010) for mobile instant message and Chang (2015) for mobile applications, reveal that perceived value is positively related to customer satisfaction. Therefore:

H2. Perceived value of AMMS positively influences user satisfaction.

Although the interrelationships between perceived value, satisfaction and loyalty have attracted much attention, few studies have compared results from different countries.

3. Culture

3.1 The importance of culture

Culture is defined as "the collective programming of the mind that distinguishes the members of one human group from another" (Hofstede, 1980, p. 5). It represents a collection

of shared values and patterns of thinking, feeling and acting that are rooted in societal conventions and influence individual perceptions, attitudes, preferences and responses (Nakata and Sivakumar, 2001; Zhou *et al.*, 2007). Culture differs intrinsically from other macro-environmental factors such as the economic, political, legal, religious, linguistic, educational, technological and industrial environments in which people find themselves (Sekaran, 1983, p. 68). Nevertheless, isolating culture from these factors is very difficult, as no clear-cut boundaries exist between the interrelated influences.

Several approaches have been proposed to analyse culture, and the direct value inference method is one of the most interesting (other methods that could be considered include ethnological description, use of proxies and the indirect value inference) (Soares *et al.*, 2007). This method measures cultural values of subjects in a sample, and infers cultural characteristics based on the aggregation of these values (Lenartowicz and Roth, 1999). Table I shows some pieces of research that have applied the direct value inference method to discuss the dimensions most appropriate for conceptualizing and operationalizing culture. Hofstede's framework is clearly remarkable in this group since it provides "the beginnings of the foundation that could help scientific theory building in cross-cultural research" (Sekaran, 1983, p. 69). Hofstede's framework is based on a multinational sample of work-related values, and it considers that culture is a too complex phenomenon to be treated as a single package. So, it proposes the existence of four original dimensions related to cultural differences which are quantified and standardized in order to facilitate multiple comparisons between countries, determining cultural distance scores. These scores measure the extent to which one country's culture is similar to, or different from, another country's culture (Clark and Pugh, 2001; Shenkar, 2001). Although Hofstede originally applied his framework to human resources management, it is being used increasingly in business,

	Object analysed	Countries	Sample	Variables
Hofstede (1980, 2001)	Dimensions of culture	70	60,000 IBM workers	Masculinity-femininity, individualism-collectivism, hierarchical distance, uncertainty avoidance
Clark (1990) ^a	Dimensions of culture	–	–	Relations to self, relation to authority, relation to risk
Schwartz (1994)	Universal psychological values	31	60,000 professors	Hierarchy <i>vs</i> equality, traditionalism <i>vs</i> autonomy, skill <i>vs</i> harmony
Trompenaars and Hampden-Turner (1997)	Dimensions of culture	30	100 workers per country (30,000)	Universalism <i>vs</i> particularism, communitarianism <i>vs</i> individualism, neutral <i>vs</i> emotional, diffuse <i>vs</i> specific cultures; achievement <i>vs</i> ascription, attitudes to time, attitudes to the environment
Inglehart <i>et al.</i> (1998)	Beliefs, values and cultural motivations	90	400,000 respondents	Traditional values <i>vs</i> secular-rational values, survival values <i>vs</i> self-expression values
Triandis and Gelfand (1998)	Dimensions of culture	2	326 students from Korea and 127 students from the USA	Horizontal <i>vs</i> vertical, individualism <i>vs</i> collectivism
Steenkamp (2001) ^a	Intangible elements of culture: values and beliefs systems	–	–	Autonomy <i>vs</i> collectivism, egalitarianism <i>vs</i> hierarchy, mastery <i>vs</i> nurturance, uncertainty avoidance

Note: ^aRefers to the theoretical contributions

Table I.
Research on culture
applying direct value
inference method

marketing and new technologies studies, being considered a benchmark in the field of cross-cultural comparison (Sondegaard, 1994; Ford *et al.*, 2003; Zhang *et al.*, 2008).

Scholars in recent years have raised concerns about over-reliance on Hofstede's framework. First, some argue that this classification was originally for work values rather than other micro-phenomena, so it may be less relevant for studies of individual behaviour (Yau *et al.*, 1999; Ford *et al.*, 2003). Second, others establish that Hofstede's dimensions assume that culture is uniform and contained within national boundaries, ignoring the presence of subcultures and possible intra-national variety (Myers and Tan, 2002). Third, some scholars maintain that the methodology applied by Hofstede (1973) is too weak: the tendency of an IBM sample does not necessarily reflect the national tendency, the data were collected in 1967-1973, and the dimensions tested are too simplistic, bipolar and do not reflect incompatible views of an individual (Albers-Miller and Gelb, 1996; McSweeney, 2002; Williamson, 2002). Finally, some highlight that it has not been proved that national culture motivates questionnaire responses, so the identification of dimensions based on empirical data rather than on the theoretical review may not be valid (McSweeney, 2002; Williamson, 2002).

In spite of these criticisms of Hofstede's framework, articles published in leading journals support its original contributions and establish its usefulness for developing theories on cultural variation (Moenaert and Souder, 1996; Png *et al.*, 2001; Dickson *et al.*, 2003). Various reasons are put forward. First, although many researchers state that culture is a very complex variable to operationalize, Hofstede's framework is analysed with a sample of 116,000 IBM employees and 400 managers from a variety of organizations. Moreover, it tested results using data from demographic, geographic, economic and political aspects of a society, and public opinion pools. Likewise, the real potential of the proposed dimensions is shown, as the framework compares data sets that have never been previously compared (Kale and Barnes, 1992; Ford *et al.*, 2003; Soares *et al.*, 2007). Second, Hofstede's framework is the norm used in international marketing studies (Dawar *et al.*, 1996; Sivakumar and Nakata, 2001) and has been a reference for newer theoretical approaches (e.g. Schwartz, 1994; Dickson *et al.*, 2003), and is more widespread than any other approach. This framework provides theoretical justification for expecting cultural differences and a practical model to identify what differences can be found between countries (Hofstede, 1998). Third, the prominence of Hofstede's framework in the cross-cultural literature has led to its dimensions being empirically tested in several countries and in most social sciences. Using this approach, our results can be compared to many other results and general conclusions can be drawn (see the meta-analyses of Kirkman *et al.*, 2006; Soares *et al.*, 2007). Fourth, Hofstede's dimensions and cultural differences are extremely persistent so changes basic enough to invalidate their country index scores should not be appreciable for a long time (according to Hofstede, 2001 and Sivakumar and Nakata, 2001, this date would be around 2001). Moreover, only data which remained stable across two subsequent surveys were maintained by the authors and recent replications show no loss of validity (Hofstede, 2001). Modifications in dynamic and fast-changing contexts like new technologies and mobile phones could be explained by culture, as identified by Hofstede. Consequently, analysis of cultural differences using Hofstede's framework is still valid. Overall, these reasons support the theoretical relevance and stability of this framework, demonstrate the rigorous method employed to develop its dimensions, and justify its further use. According to Blodgett *et al.* (2008), we can state that Hofstede's framework provides the catalyst for many studies on consumer IT behaviour.

We describe below the four main dimensions proposed in Hofstede's framework and their importance in the two countries of our research, Greece and Spain.

Masculinity is defined as the degree to which values like assertiveness, performance, success and competitiveness – associated with the role of men – prevail over other values,

such as maintaining warm personal relationships, taking care of the weak, and solidarity – the role of women – (Hofstede, 1993; Sun and Zhang, 2006). Masculine cultures place more emphasis on work and material achievement, whereas feminine societies emphasize human values such as modesty, tenderness and quality of life (Moghadam and Assar, 2008). According to the Hofstede scores, masculinity is lower for Spain (42) than for Greece (57), a difference of 13 per cent. The average for Europe is 49.

The individualism-collectivism dimension refers to the degree to which the members of a society prefer to act as individuals instead of as part of a group (Sun and Zhang, 2006). A person with a high level of individualism considers him/herself as being more important than the collective entity and expects that everyone will take care of him/herself. In collective societies, people are integrated into groups that are strongly united and tend to act as extensions of the family (Harris *et al.*, 1995). The average for Europe is 60. The high level of individualism in Spain (51) vs Greece (35) is an indicator that Spanish society has more individualist attitudes and fewer bonds of cohesion with others. Spanish individuals have more trust in themselves as independent individuals. In Greece, however, people have stronger ties with the other members of society, relationships are closer, and there is a greater degree of group cohesion. The two countries are in different intervals of the individualism index with a difference of 13.4 per cent.

Hierarchical distance can be defined as the degree of inequality that is considered reasonable among the people of a given society: from relatively equal (e.g. low hierarchical distance score) to extremely unequal (high hierarchical distance score). The hierarchical distance for the two countries in this study is quite similar and greater than in Europe (with an average of 50) Greece scores 60 while Spain scores 57. These figures indicate that both countries accept an unequal distribution of power, with a difference of just 3 per cent.

Uncertainty avoidance refers to the perception of the threat that ambiguity and novelty generates. Cultures that value uncertainty avoidance try to minimize the possibility of unstructured, surprising and unknown situations by favouring strict rules, laws and principles (Lam *et al.*, 2009). People who do not mind assuming situations of risk prefer not to be subject to rules and regulations. For Greece (112), as well as for Spain (86), uncertainty avoidance is the highest scoring dimension, the European average being 70 and that of the world, 64. In this dimension, the two countries are in different intervals with a difference of 21.6 per cent.

Cultural dimensions play an important role in consumer behaviour and in the continued use of services (Tsaur *et al.*, 2005). Consequently, it is highly probable that culture, as well as questions related to technological infrastructure and economic development, affects the diffusion of mobile phone services. The influence of perceived value may vary due to the effect of the cultural characteristics of each country, generating different levels of satisfaction and loyalty that explain the different adoption rates and post-acceptance behaviour. Specifically, we centre on the effect of individualism-collectivism, uncertainty avoidance and masculinity dimensions because these three dimensions show greater distances with Europe and between the two countries, with percentage differences of more than 10 per cent, they are easier to interpret, being related to important determinants of user's technological behaviour such as the perceived risk (Hassan *et al.*, 2016) and they have been those most used to analyse cultural differences in the IT arena (Yoo, 2009; Sabote-Ortiz *et al.*, 2016). We rely on these dimensions to propose the hypotheses and explain differences between Spain and Greece, but we analyse the influence of culture at a whole, comparing the findings of the proposed model in both countries.

The present study conceptualizes culture at a national level and employs Hofstede's (2001) values to measure its influence. These values are broad rather than specific, so they reflect the overall behaviour of both countries beyond the particular characteristics of their individuals. Although this approach has many supporters, it is also controversial and has

received several criticisms[1] (for reviews see Minkov, 2013; Minkov and Hofstede, 2012). Trying to overcome these criticisms, some studies have compared national-level vs individual-level approaches in cultural studies. They conclude that some cultural dimensions such as individualism have stronger moderating effects at a national level (Taras *et al.*, 2010; Frank *et al.*, 2015). So, culture acts as a gravitationally force that brings the regions of a nation together, into a shared cultural space. These conclusions are consistent with classic sociology research which already argues that group-level variables have effects over and above the characteristics of group members (Erbring and Young, 1979). Table II shows several studies that apply the national-level approach to study individual's loyalty and/or technological behaviour.

3.2 Differences in perceived value, satisfaction and loyalty

As we have already explained, the increasing pace of globalization in the mobile phone industry requires an understanding of cultural differences because they affect how people use and adopt new services and technologies (Straub *et al.*, 1997; Choi and Totten, 2012). In particular, cultural orientation is a powerful force in forming individual attitudes and behaviours (Homer and Kahle, 1988; Gregory *et al.*, 2002). In accordance with the cultural characteristics of Greece and Spain described above, we propose the following differences in the hypotheses formulated.

Several studies have proposed reasons for a higher satisfaction-loyalty link in collectivist cultures (see e.g. Jin *et al.*, 2008). They consider that collectivist individuals are integrated into strong cohesive groups (Kang and Jung, 2014; Ali *et al.*, 2015) and establish affective bonds with their social environment, including firms and brands with which they interact (Liu *et al.*, 2001). These individuals develop engagement feelings during commercial relationships, so they are more tied after the transaction (Laroche *et al.*, 2004) and are less prone to express their complaints (Liu *et al.*, 2001). So, once satisfied, members of collectivist cultures, such as Greek customers, are more willing to adhere to the product and provider because they consider that the product and provider belong to their environment. They are expected to be more loyal and committed in their business relationships with the firms with which they deal (Ali *et al.*, 2015). In contrast, customers with high individualism, such as Spanish customers, may openly express their satisfaction but easily change product and/or provider preferences because during the interaction they do not develop affective bonds to the others. In the field of AMMS which are focussed, as explained before, in services that facilitate ubiquitous interactions and make social interaction easier, it makes sense to expect that the same degree of satisfaction with the service will increase loyalty to a higher degree as the characteristics of these services are especially relevant for collectivistic culture customers. At the same time, Greek customers belong to a culture that dislikes uncertainty to a higher degree than Spanish customers. Seeking for alternative service providers is always a risky decision which forces customers to leave their comfort area since nobody can be sure that the new provider will offer them a higher service performance. Accordingly, it makes sense to expect that for a similar degree of satisfaction Greek users will tend to be more loyal to avoid the risk of switching. Therefore, the effect of individuals' satisfaction on their loyalty towards the service is expected to be higher in collectivist cultures with high uncertainty avoidance:

H3. The influence of satisfaction on loyalty is higher for Greek users than for Spanish users.

As stated before, individuals in cultures with high uncertainty avoidance feel threatened by unfamiliar situations (Hofstede, 1991), so they tend to keep away from products, firms, relationships and activities that can involve unknown implications (Murray, 1991). They try to reduce the level of risk and continue to use the same products that have already satisfied them. But at the same time, a rational consumer cannot take the decision to be loyal to a

Authors	Context	Countries	Cultural dimensions	Findings
<i>Research about the influence of culture on the effect of loyalty antecedents</i>				
Jin <i>et al.</i> (2008)	E-commerce	South Korea and the USA	Culture as a whole	The influence of e-satisfaction on e-loyalty is greater in South Korea than in the USA
Dash <i>et al.</i> (2009) ^a	Banking services	Canada and India	Power distance and Individualism	These cultural dimensions are correlated to SERVQUAL dimensions
Smith and Reynolds (2009)	Higher education	Africa (East/West), China and England	Individualism	Differences in the relationships between quality, satisfaction, affect/emotion and loyalty
Pantouvakis (2013)	Tourism sectors (hotel customers)	Austria, Germany, France, Belgium, USA, England, Dutch, Scandinavian countries and other European countries	Culture as a whole	Culture moderates the relationship between satisfaction and loyalty
Zhang <i>et al.</i> (2014)	Banking and supermarket customers	China and the Netherlands	Culture as a whole	Value, brand and relationship equity exert a greater influence on loyalty in The Netherlands than in China. Chinese customers have higher loyalty intentions
Carlson <i>et al.</i> (2015)	Online channel of multichannel retailers	Austria and France	Culture as a whole	No statistical differences are found between the Australian and the French sample for the relationships between perceived value, satisfaction and loyalty
<i>Research about the influence of culture on the use of ITs</i>				
Chai and Pavlou (2004)	Electronic commerce	Greece and the USA	Uncertainty avoidance	The influence of perceived behavioural control on purchase intentions is weaker in a society with high uncertainty avoidance. The influence of attitude on purchase intentions is weaker in a society with high uncertainty avoidance
McCoy <i>et al.</i> (2005)	E-mail	Uruguay and the USA	Culture as a whole	Perceived control influences behavioural intentions to use e-mail more strongly in Uruguay than in the USA
Lippert and Volkmar (2007)	IT acceptance (collaborative visibility network)	Canada and the USA	Masculinity	Canadians respond with less intensity than US people: in their overall evaluation towards a new IT, on normative expectations for a new IT and on awareness of supply chain functions of a new IT
(continued)				

Table II.
Research on culture
at a national level

Table II.

Authors	Context	Countries	Cultural dimensions	Findings
Yang and Jolly (2009)	Mobile data service adoption	America and Korea	Culture as a whole	Culture moderates the influences of social and monetary value on attitude
Kassim and Abdullah (2010)	E-commerce	Qatar and Malaysia	Culture as a whole	The influence of satisfaction on trust is greater in Qatar
Smith <i>et al.</i> (2013)	Online shopping behaviour	Germany, Norway and the USA	Culture as a whole	The relationship between perceived ease of use and behavioural intentions is stronger in the USA than in Norway. The relationship between perceived usefulness and behavioural intentions is weaker in the USA than in Norway. No significant differences can be identified between the USA and Germany
Belanche <i>et al.</i> (2015)	Websites	Spain and Argentina	Individualism, pragmatism and masculinity	The influence of e-service quality on loyalty intentions is greater in Argentina. The influence of consumer satisfaction on loyalty intentions is greater in Spain
Hsu <i>et al.</i> (2015)	Social networking	Australia, Austria, Japan, Taiwan and the USA	Individualism	Information seeking has a stronger influence on continuance intentions for individualist cultures than for collective cultures. Socialization has a stronger influence on continuance intentions for collective cultures than for individualist cultures
Mortimer <i>et al.</i> (2015)	Mobile banking	Australia and Thailand	Individualism	Individualism moderates the relationships between perceived risk and intentions to use, as well as social influence on intentions to use
Muk and Chung (2015)	SMS advertising	Korea and the USA	Culture as a whole	Significant differences of perceived usefulness and attitudes towards intentions to use between Koreans and Americans
Note: ^a This research analysed the moderating effect of culture both at the individual and national level				

provider if this provider is not giving a good service because the cognitive dissonance would be unbearable. So, these individuals will be looking for arguments that allow them to avoid service switching, and a high degree of perceived value is the best argument that could be found. Under this argument, in cultures with high uncertainty avoidance, such as Greece, the effect of perceived value on satisfaction must be greater as the role of perceived value perfectly suits individuals needing uncertainty avoidance. Moreover, individuals in masculine cultures are results oriented and therefore more concerned about the benefits and success they can obtain by using a product (Sun and Zhang, 2006). Compared to other mobile services, new uses and communication promoted by AMMS will improve perceived value and this value will be a more intense conditioner of satisfaction in masculine cultures. Finally, more collectivist cultures like Greece perceive greater value in technologies that enable them to communicate, enjoy and interchange experiences with their social environment, since these technologies give them emotional and social value and increase their satisfaction (Zhang and Maruping, 2008; Smith and Reynolds, 2009). Therefore, the effect of perceived value on satisfaction is expected to be higher in collectivist cultures with high uncertainty avoidance and masculinity, such as Greece:

H4. The influence of perceived value on satisfaction is higher for Greek users than for Spanish users.

Figure 2 shows the model and hypotheses proposed.

4. Data analysis

4.1 Methodology

In previous research, several approaches have been used to study the behaviour of mobile services users. Some researchers measure the real behaviour of users/consumers by recording their use: for example, Nitzan and Libai (2013) study average monthly use in hours and Polo and Sese (2013) analyse service usage through the mobile credit consumed. Other researchers use a survey asking about individual's perceptions and intentions to behave in a specific way (e.g. Zhou and Lu, 2011; Wang and Wu, 2012). Despite the limitations of the second approach that may arise from the discrepancy between intentions

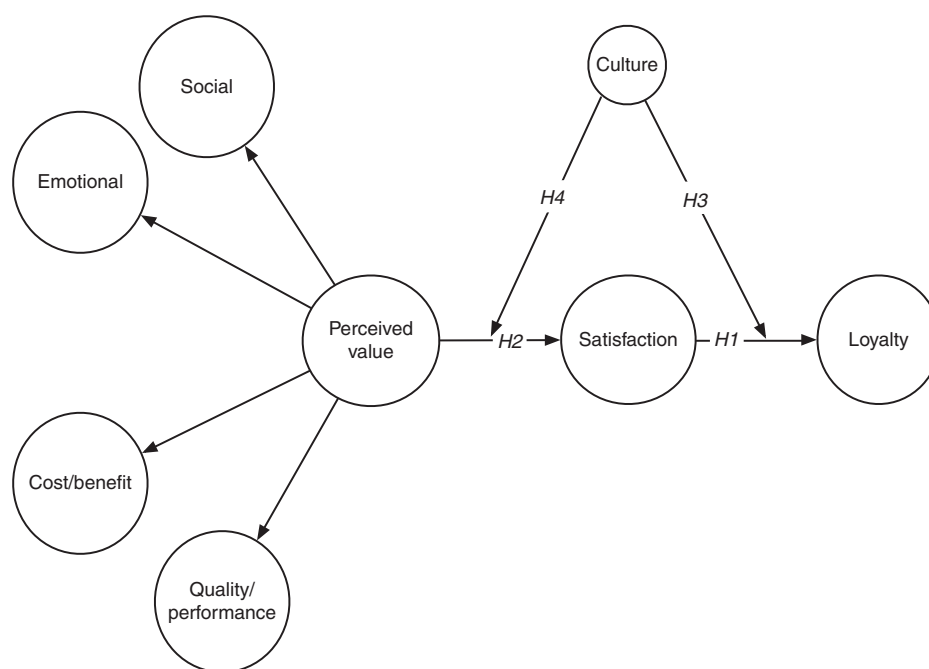


Figure 2.
Hypothesized model

and real behaviour, perceived value dimensions can only be measured using this approach. So, the research tool we applied was a personal survey with a structured questionnaire. To minimize the above limitations, before starting to gather information, a set of personal in-depth interviews was carried out with AMMS users. The interviews allowed us to test the relevance of each dimension of perceived value, understanding general user attachment to the services and evaluating if we could expect consistency between perceived value, intention and behaviour from the final survey results. Moreover, a pre-test was carried out with a sample of 20 Spanish and 20 Greek AMMS users, which made it possible to improve the drafting of some of the items and avoid confusion in their interpretation.

We have tried to select two countries with very similar economic indicators and a similar IT infrastructure (see Netsize, 2012) in order to control for as many environmental variables as possible and limit the influence of variables not included in our model. Some indicators like annual growth rate, consumer price index, unemployment rate and mobile rate penetration are analogous in Spain and Greece in the year of study. Nevertheless, other factors, such as religion and the political situation, do differ between the two countries.

To ensure that the respondent profile reflected user characteristics, age quotas were established according to the profiles reflected in Pihlström and Brush (2008), Tsang *et al.* (2004) and Xu *et al.* (2008). The fieldwork was carried out between August and September 2011, obtaining a sample of 158 users in Spain and 156 users in Greece. Table III reproduces the final sample demographics. We treat both samples globally, without defining user profiles within each sample. Culture is defined at a national level as a moderating variable following the original Hofstede's (1998) framework and recommendations, since it exerts a subtle and powerful influence on people and organizations (Leidner and Kayworth, 2006). Consequently, no measure of individual scores in each dimension has been used. National-level approach allows us to employ objective data obtained from secondary sources of information (Hofstede, 2001), which alleviates common method bias between cultural values and the other variables of the survey (Zhou *et al.*, 2015). Moreover, trying to avoid any discrepancy derived from the existing intra-national clusters, we have not included in the study regions in Spain and Greece that are not attached with their country (see these clusters in Minkov and Hofstede, 2014).

In all cases, the variables analysed were measured using seven-point Likert scales, in which 1 indicates "strongly disagree". They were adapted from other research (see Table AI). The adaptation consisted of replacing the service worded in the original scale with the service in our research, namely, AMMS.

4.2 Measurement model assessment

In order to estimate the proposed model, first of all, the reliability and validity of the measurement model was evaluated. Given the size of both samples, partial least

Variable	Greece <i>n</i> = 156	Spain <i>n</i> = 158
<i>Age</i>		
14-24	53.8	53.8
25-34	35.3	33.5
35-49	7.7	8.9
50+	3.2	3.8
<i>Sex</i>		
Male	53.2	42.4
Female	46.8	57.6

Table III.
Sample demographics

squares modelling was used (Tenenhaus *et al.*, 2005), employing SmartPLS 3.0 software (Ringle *et al.*, 2015). Tables IV and V show the results of the evaluation for reliability and convergent validity, respectively, for Spain and Greece. The indicators show a high internal consistency. In all cases, Cronbach's α exceeds the 0.70 value as recommended by Nunnally and Bernstein (1994). The composite reliability coefficient, which represents variance shared between indicators measuring the same construct (Fornell and Larcker, 1981), reaches the minimum value of 0.70 in all cases (Bagozzi and Yi, 1988). Similarly, the average variance extracted (AVE) exceeds the value of 0.50 for all constructs (Fornell and Larcker, 1981) (Tables IV and V).

As evidence of convergent validity, the results show that all the indicators are significant ($p < 0.01$) and their standardized loadings are higher than 0.70 (Bagozzi and Yi, 1988). Discriminant validity was evaluated (Table VI), confirming that the AVE exceeds the variance shared with any other factor in the model (i.e. the squared correlation between the two factors) (Fornell and Larcker, 1981).

On the basis of these criteria, we conclude that the measurement scales exhibited sufficient evidence of reliability and convergent and discriminant validity.

Table VII shows the results of the analysis carried out to test the proposed hypotheses. In line with Hair *et al.*'s (2012) recommendations, bootstrapping was applied (5,000 sub-samples of the same size as the original sample for each country) to obtain standard errors and t -values in order to evaluate the significance of the parameters.

Factor	Indicator	Factor loading	Bootstrap t -value	CA	CR	AVE
Emotional value	VPE1	0.87**	23.64	0.94	0.95	0.80
	VPE2	0.89**	54.74			
	VPE3	0.92**	45.35			
	VPE4	0.94**	90.72			
	VPE5	0.90**	58.25			
Social value	VPS1	0.90**	53.37	0.95	0.96	0.87
	VPS2	0.93**	72.49			
	VPS3	0.91**	52.38			
	VPS4	0.86**	33.86			
Cost-benefit value	VPV1	0.90**	35.66	0.90	0.93	0.77
	VPV2	0.92**	52.15			
	VPV3	0.95**	92.20			
	VPV4	0.89**	37.60			
Quality-performance value	VPC1	0.90**	50.87	0.88	0.92	0.80
	VPV2	0.88**	37.56			
	VPC3	0.88**	40.58			
Satisfaction	SAT1	0.92**	57.84	0.95	0.96	0.87
	SAT2	0.90**	58.12			
	SAT3	0.91**	58.21			
	SAT4	0.91**	63.57			
Perceived value	Emotional	0.94**	88.13	0.94	0.95	0.84
	Social	0.92**	66.16			
	Cost-benefit	0.92**	78.43			
	Quality-performance	0.88**	44.34			
Loyalty	APR1	0.90**	34.85	0.96	0.97	0.86
	APR2	0.89**	55.46			
	APR3	0.89**	44.40			
	APR4	0.87**	38.82			
	APR5	0.88**	43.91			

Notes: CA, Cronbach's α ; CR, composite reliability; AVE, average variance extracted. ** $p < 0.01$

Table IV.
Measuring model
assessment for Greece
(reliability and
convergent validity)

Factor	Indicator	Factor loading	Bootstrap <i>t</i> -value	CA	CR	AVE
Emotional value	VPE1	0.84**	26.04	0.94	0.96	0.82
	VPE2	0.87**	31.63			
	VPE3	0.90**	56.56			
	VPE4	0.89**	43.93			
	VPE5	0.91**	52.12			
Social value	VPS1	0.92**	44.13	0.92	0.94	0.81
	VPS2	0.96**	131.86			
	VPS3	0.92**	48.97			
	VPS4	0.93**	64.85			
Cost-benefit value	VPV1	0.86**	25.47	0.94	0.96	0.84
	VPV2	0.84**	27.33			
	VPV3	0.90**	41.88			
	VPV4	0.83**	25.30			
Quality-performance value	VPC1	0.85**	30.60	0.86	0.92	0.78
	VPV2	0.92**	60.70			
	VPC3	0.89**	43.03			
Satisfaction	SAT1	0.88**	41.73	0.93	0.95	0.83
	SAT2	0.94**	87.00			
	SAT3	0.93**	49.95			
	SAT4	0.94**	74.63			
Perceived value	Emotional	0.89**	55.95	0.88	0.86	0.61
	Social	0.79**	19.68			
	Cost-benefit	0.76**	16.37			
	Quality-performance	0.68**	13.59			
Loyalty	APR1	0.91**	58.51	0.93	0.95	0.78
	APR2	0.94**	85.32			
	APR3	0.95**	111.53			
	APR4	0.93**	67.37			
	APR5	0.89**	41.90			

Table V.
Measuring model
assessment for Spain
(reliability and
convergent validity)

Notes: CA, Cronbach's α ; CR, composite reliability; AVE, average variance extracted. ** $p < 0.01$

	1	2	3	4	5	6	7
1. Cost-benefit value	0.92/0.86	0.50	0.41	0.76	0.43	0.33	0.54
2. Emotional value	0.83	0.90/0.88	0.77	0.89	0.58	0.65	0.60
3. Loyalty	0.70	0.83	0.88/0.92	0.72	0.55	0.78	0.47
4. Perceived value	0.92	0.94	0.82	0.83/0.71	0.68	0.62	0.79
5. Quality-performance value	0.71	0.78	0.77	0.88	0.88/0.89	0.63	0.26
6. Satisfaction	0.69	0.78	0.88	0.78	0.74	0.91/0.92	0.33
7. Social value	0.81	0.77	0.69	0.92	0.81	0.66	0.90/0.93

Table VI.
Measuring model
assessment
(discriminant validity)

Notes: The diagonal represents the squared root of the average variance extracted (Greece/Spain). Above the diagonal, correlations are represented for Spain, and below the diagonal, for Greece

Although the R^2 of the dependent variables for both countries exceeded the value of 10 per cent suggested by Falk and Miller (1992), power analysis was carried out using G*Power (Faul *et al.*, 2007) in order to confirm that the R^2 s guaranteed a power above 80 per cent (Cohen, 1988). A positive blindfolding Q^2 statistic (Stone, 1974; Geisser, 1975) demonstrated the predictive relevance of the estimated model.

In order to evaluate the moderating effect of culture on the proposed relationships, an approach recently put forth by Henseler *et al.* (2009) was followed. Instead of assuming that the data follow normal distributions, the observed distribution of the bootstrapped

estimation of the parameters is evaluated. If $b^{(1)}$ and $b^{(2)}$ are the bootstrapped estimation of the regression coefficients in the two sub-samples (e.g. the influence of perceived value on satisfaction in Spain and Greece), the probability that both parameters are significantly different can be shown as:

$$P\left(b^{(1)} > b^{(2)} \mid \beta^{(1)} \leq \beta^{(2)}\right) = 1 - \sum_{\forall j,i} \frac{\Theta\left(2\bar{b}^{(1)} - b_j^{(1)} - 2\bar{b}^{(2)} + b_i^{(2)}\right)}{J^2}$$

where $\beta^{(1)}$ and $\beta^{(2)}$ represent the population values of the regression coefficients in the two sub-samples, $b_j^{(1)}$ and $b_i^{(2)}$ are each of the J estimates via bootstrapping (5,000 in our case), $\bar{b}^{(1)}$ and $\bar{b}^{(2)}$ are the averages in the J estimates and Θ is a function that takes the value 1 if the argument is positive and 0 when it is not.

5. Results

As Table VII shows, first, the effect of perceived value on satisfaction is highly significant for Greece and Spain ($H2$; $\beta_g = 0.78$, $p < 0.01$; $\beta_s = 0.64$; $p < 0.01$) and the same result holds for the effect of satisfaction on loyalty ($H1$; $\beta_g = 0.88$, $p < 0.01$; $\beta_s = 0.79$; $p < 0.01$). $H1$ and $H2$ are confirmed.

Focussing on the moderating hypotheses, Henseler's test (Henseler *et al.*, 2009) verifies that the influence of perceived value on satisfaction is significantly higher in Greece than in Spain ($\alpha = 0.003$) and the same result can be found for the effect of satisfaction on loyalty ($\alpha = 0.005$). $H3$ and $H4$ are verified. Therefore, cultural differences do exist and they are strong. Both the effect of perceived value on satisfaction and the influence of satisfaction on user loyalty are greater in collectivist cultures with high uncertainty avoidance and masculinity, such as Greece. Customers in these cultures establish affective bonds with the service during their interactions, value the competitiveness and success that they can obtain, and try to avoid the risk derived from changing the service.

6. Theoretical contributions and practical implications

6.1 Theoretical contributions

The present paper contributes to the literature by formulating a theoretical framework that analyses the moderating effect of culture and studies individual's post-acceptance of AMMS, considering the role of perceived value, satisfaction and loyalty.

The first contribution is related to the analysis of the moderating effect of culture, testing the proposed model in Spain and Greece. As far as we know, this is one of the first studies to demonstrate the importance of multidimensional perceived value in different countries for the mobile sector. Despite the evident similarities between the two countries in variables such as economic indicators and technological infrastructure, very important cultural differences arise when they are compared. Our research has demonstrated that the effect of

Hypothesis	Relationship (Total effects for PV and PV dimensions)	Standardized coefficients (bootstrap t -values)		$\alpha = 1 - \text{Prob}(\beta_g > \beta_s)$
		Greece (β_g)	Spain (β_s)	
$H1/H3$	Satisfaction→Loyalty	0.88** (46.42)	0.79** (25.39)	0.005**
$H2/H4$	Perceived value→Satisfaction	0.78** (22.26)	0.64** (15.71)	0.003**

Notes: Greece: $R^2(\text{loyalty}) = 0.78$; $Q^2(\text{loyalty}) = 0.60$; $R^2(\text{satisfaction}) = 0.61$; $Q^2(\text{satisfaction}) = 0.51$. Spain: $R^2(\text{loyalty}) = 0.60$; $Q^2(\text{loyalty}) = 0.54$; $R^2(\text{satisfaction}) = 0.39$; $Q^2(\text{satisfaction}) = 0.35$. * $p < 0.05$; ** $p < 0.01$

Table VII.
Results

perceived value on satisfaction and the effect of satisfaction on loyalty vary across countries, modifying user behaviour. Therefore, these differences should be taken into account before generalizing perceived value or satisfaction effects, since in otherwise conclusions and implications about these variables will not be valid.

The second contribution concerns the approach applied, related to the individual's post-acceptance behaviour in the mobile service context. As stated before, most research on mobile services is focussed on initial use. Nevertheless, we consider that the quick evolution of mobile services requires that user's post-acceptance behaviour to be studied, when he/she has already applied these services and knows the value that he/she can obtain. Perceived value has been conceptualized as a complex reflective second-order construct that synthesizes the effect of the four dimensions which define it.

Overall, this paper explains how AMMS should be adapted to each country depending on its cultural features and why post-acceptance behaviour may differ across countries.

6.2 Business and practical implications

Our results have important implications for mobile service operators and application developers as they improve understanding of the critical determinants of users' decisions to use value-added services. First, our results allow companies to deal with the user's post-acceptance behaviour and to design specific strategies based on perceived value, satisfaction and loyalty. Second, the results regarding the influence of cultural differences can be used by companies to more efficiently allocate resources in each country. The combination of user's post-acceptance behaviour, perceived value and cultural differences provides a decision grid to guide managers in their search for effective service development.

Regarding perceived value, interactions via AMMS with other users do not need to be designed solely to allow for communication (functional value) but should also constitute a recreational experience (emotional value) in order to boost customer satisfaction and loyalty. Mobile developers should focus their attention on attractive applications and menus that make messages interesting and entertaining, including, for example, original emoticons that creatively reflect what users want to communicate. Social value is also relevant since, whatever a country's level of collectivism, users are looking for the best way to interact with their social environment using AMMS. We recommend mobile companies to promote the positive social effects associated to the use of these services. These effects of perceived value may improve user satisfaction, become important switching barriers and enhance customer loyalty.

Furthermore, mobile companies should adapt their price strategies and investments in AMMS depending on the country they target. Ignoring that the effect of perceived value on satisfaction and of satisfaction on loyalty is significantly stronger in countries with a higher degree of masculinity, uncertainty aversion and collectivistic behaviour can, for instance, provoke a non-efficient resource allocation in communication investments as lower amounts can be invested in these countries to achieve the same effects. Marketing strategies such as informing the user of the costs involved, offering price cuts or selling promotions, will be more successful in countries like Greece because the value generated will influence users' satisfaction more intensely. Therefore, the internationalization policy of mobile service operators and application developers should take culture into account. A system feature appropriate for one country may not be appropriate for others without significant adaptation.

In order to enhance loyalty and continuance intentions, mobile companies can develop customizing strategies adapted to the requirements and culture of users that already used AMMS (i.e. post-acceptance). Moreover, it would be interesting to develop several types of services with different aims that allow individuals to carry out numerous uses and to achieve different gratifications. So, AMMS related to problem solving (e.g. learning, positioning, health, etc.), entertainment and leisure (e.g. games, music, video, photos, etc.), communication (e.g. social networking) and commercial transactions, will generate not only

social but also functional and emotional value. These values can be jointly developed through the use of different AMMS. Mobile companies should also take into account that users have many alternative mobile services that provide similar functions, and most of them are free. Thereby, they should offer trial versions of their AMMS to increase their competitiveness.

Finally, as internet-based mobile applications are growing daily more important in industry portfolios, we will try to link our results to the specific characteristics of these applications. First, it should be highlighted that internet-based mobile applications allow real time information and communication, and have hedonic attributes such as avatar shows, games and music. These characteristics make user loyalty be highly connected with the opportunity to have fun and social interactions. These issues allow us to suppose that social and hedonic components of perceived value are inherent to internet-based mobile applications and will be very positively considered by all users, as our results also show for AMMS. Second, it should be highlighted that the tariffs associated with these services are different to those associated with more traditional mobile services. The former are related to a single payment for a specific amount of data, regardless of the number of applications using those data. However, it should be borne in mind that, although internet-based mobile applications do not mean additional cost, they do imply an investment of time and effort (e.g. to learn how they work). Balancing cost and time investment with these application advantages depends on each user and may differ depending on the country's culture, as we have shown for AMMS in Spain and Greece.

7. Conclusions, limitations and future lines of research

In recent years, the high level of penetration and use of mobile phone devices in the majority of countries has favoured the development of marketing strategies. These strategies try to improve the relationship with current users and create loyal customers through the consumption of new services that offer more value than voice services. AMMS are a good example of these new services.

Our results highlight that to properly understand customer loyalty and post-acceptance behaviour we need to deconstruct perceived value and analyse it as a multidimensional reflective construct. Perceived value is high in both countries. An explanation is that users employ AMMS to have fun and to socialize, increasing the overall evaluation of their experience. Therefore, aspects such as fun, relaxation and enjoyment are relevant for AMMS use, since users will associate them with the service. Perceived value is also relevant because AMMS facilitate communication among users, making the social value an intrinsic and important characteristic of the service. Moreover, there are functional aspects related to the perceived value that have to be taken into account. Users seek not only for hedonic experiences when using these services but also practical and economic characteristics. All these components are interrelated and form the individual's value perception while using AMMS.

In line with our theoretical propositions about culture, we find that the proposed hypotheses differ between countries and may depend on national characteristics. We should keep in mind that we applied a national-level approach to test the effect of culture. Therefore, we cannot be sure that individuals included in both samples always carry the values proposed by Hofstede. We should consider our conclusions referred to the country at a whole. Perceived value has a higher impact on satisfaction in Greece. This result can be explained by factors like uncertainty avoidance, masculinity and collectivism, which imply that Greek users have a higher degree of aversion to change, are more results oriented and value those technologies that allow them to interact and feel a sense of belonging to a group. These users do not desire to try new alternatives with unknown risks so perceived value is a guarantee of the expected results that they can obtain. Moreover, satisfaction has a greater

effect on user loyalty in Greece, due to the country's collectivism. So, collectivistic individuals tend to establish greater social links with people, products and brands with which they have established some relationship, creating feelings of loyalty that go beyond the mere exchange.

7.1 Limitations and future research lines

The conclusions reveal a series of limitations and open up future lines of research.

First, we should highlight the problems related to the method applied because the use of convenience sampling limits the generalization of the results. Although comparison of the sample profile with the population profile confirms the quality of the sample, random sampling will be used in future research. Furthermore, we applied a Likert-type questionnaire when other alternative methods based on recording the consumer using the service could be very useful to understand real user behaviour (see e.g. Nitzan and Libai, 2011; Polo and Sese, 2013). In future research, these data could be crossed with information from surveys for perceptual variables.

Second, it should be taken into account that AMMS have particular features that may condition an individual's perceptions and behaviour so, in future studies we will test the proposed model for other mobile value-added services. Comparison of different services will allow us to conclude whether the effect of value dimensions on user behaviour and cultural differences are contingent to the features of each service.

Finally, most of our conclusions are related to the characteristics and culture of the countries analysed. As we have previously stated, diffusion of these services changes between countries so our results cannot be globally applied. Moreover, consequences of different average income, economic situation, political situation and communication infrastructure cannot be exhaustively controlled. In future research, we would like to compare countries with similar cultures but with different economic, political and technological environments, such as South American countries, in order to test which differences in perceived value arise from them. Consequently, we will provide a wider picture of mobile services because the relative effect of culture can be compared with the relative effect of these other variables.

Note

1. The main criticisms to this approach are related to the following issues: it implicitly assumes that country is a surrogate variable for culture (Myers and Tan, 2002; Tams, 2013), it considers that individuals from a country always carry the values proposed by Hofstede for the whole nation and it does not take into account the large subcultures of some countries.

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Appendix

Perceived value of AMMS

Factor	Source
<i>Perceived value</i>	Adapted from: Sweeney and Soutar (2001), Turel <i>et al.</i> (2007)
Quality-performance dimension	
AMMS offer me consistent quality of service	
AMMS are well designed	
AMMS offer an acceptable standard of quality	
Emotional dimension	
I enjoy using AMMS	
AMMS make me want to use them	
I feel relaxed when I use AMMS	
Using AMMS makes me feel good	
Using AMMS is a pleasant experience	
Cost-benefit dimension	
AMMS are reasonably priced	
AMMS offer me added value in exchange for their price	
The quality of AMMS is good relative to their price	
Using AMMS is economical	
Social dimension	
The use of AMMS helps me feel accepted	
The use of AMMS improves the way I am perceived	
The use of AMMS makes a good impression on other people	
The use of AMMS gives me social approval	
Satisfaction with AMMS	Adapted from: Oliver (1981), Flavian <i>et al.</i> (2006)
I think my decision to use AMMS was right	
My experience using AMMS has been satisfactory	
I am satisfied with the way I have used AMMS in the past	
In general, I am satisfied with my decision to use AMMS	
Loyalty to AMMS	Adapted from: Cyr <i>et al.</i> (2006), Zeithaml <i>et al.</i> (1996)
If I had to choose again, I would choose to use AMMS messages	
I intend to continue using AMMS messages in the future	
I would recommend the use of AMMS message to anyone who asked me for advice	
I would encourage friends and acquaintances to use AMMS	
I would mention positive aspects related to the use of AMMS to other people	

Table AI.
Measurement of
the variables

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