

How to improve travel-app use continuance: The moderating role of culture

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ABSTRACT

The use of travel apps profoundly influences the behavior of tourists throughout the entire tourism experience. The aim of the present study is therefore to contribute to travel-app use continuance. An extended 'continued use' model based on the UTAUT2 framework is proposed, including important tourist behavior variables: satisfaction, privacy risk, personalization, e-WOM, relative advantage, aesthetics, social interaction, and information quality. The importance of culture for technology acceptance and use is also verified, as is culture's influence on tourist behavior, the latter being reflected in the moderating variables of the proposed model: the cultural dimensions of uncertainty avoidance and individualism/collectivism.

1. Introduction

The development of smartphones and apps has profoundly affected people's behavior and ways of relating to one another (Hoehle & Venkatesh, 2015). In the tourism sector, the arrival of mobile technology increased travel and changed tourist behavior (Wang, Xiang, & Fesenmaier, 2016). Authors such as Gokgoz, Ataman, and van Bruggen (2021) emphasize the need for further studies on the factors related to app acceptance, as the literature, to date, has not yet examined app user behavior or the strategies adopted by app developers in any great depth (Dinsmore, Swani, Goodrich, & Konus, 2021).

Different theories and models have been used to study the factors that affect technology acceptance and use, among which the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Expectation-Confirmation Model-Information Systems (ECM-IS), among others, stand out. When analyzing technology acceptance, it is important to note the difference between adoption and continued use (Bhattacharjee, 2001). The former refers to the initial stage during which an individual selects a particular mobile app, for instance (Kim, Lin, & Sung, 2013); and the latter generally refers to its subsequent sustained use by long-term users (Yoon & Rolland, 2015). This difference is important, since almost 40% of users who download an app abandon it immediately after one use following download (Fang, Zhao, Wen, & Wang, 2017). App acceptance has been widely studied in the literature, but *continued* app use requires more extensive, in-depth research (Lee, 2018). Furthermore, like all other technologies, app adoption and use are affected by the culture of the users (Hoehle, Zhang, & Venkatesh, 2015; Jung, Lee, Chung, & tom

Dieck, 2018) because cultural differences can pose a barrier to the process of acceptance of information technologies (Erumban & De Jong, 2006; Van Everdingen & Waarts, 2003). Therefore, given that culture is known to affect behaviors, it is necessary to study how it may also shape the continued use of travel apps (De Mooij, 2019; Hofstede, Hofstede, & Minkov, 2010).

However, there are very few studies that deal with travel apps in particular, and even fewer that verify the effect of culture on their continued use (Gupta, Dogra, & George, 2018; Law, Chan, & Wang, 2018). The aims of the present research are therefore (a) to propose an extended model of the UTAUT2 (Venkatesh, Thong, & Xu, 2012) that incorporates relevant variables affecting behavior in terms of continued travel-app use and (b) to analyze how culture—in the form of the cultural dimensions of uncertainty avoidance and individualism—affects the relationships proposed in the model. The results of this research highlight the behavioral variables or attributes of the apps that tourism and technology-providers must consider in their design, bearing in mind the culture of the users, to optimize the tourist experience via technology.

2. The evolution of travel apps and a proposed continued-use model

Technology acceptance has been a prominent subject of study in the fields of marketing and information and communications technology; over the last three decades, researchers have studied the factors that influence technology acceptance to predict and explain technology use (Tarhini, Arachchilage and Abbasi, 2015; Venkatesh et al., 2012).

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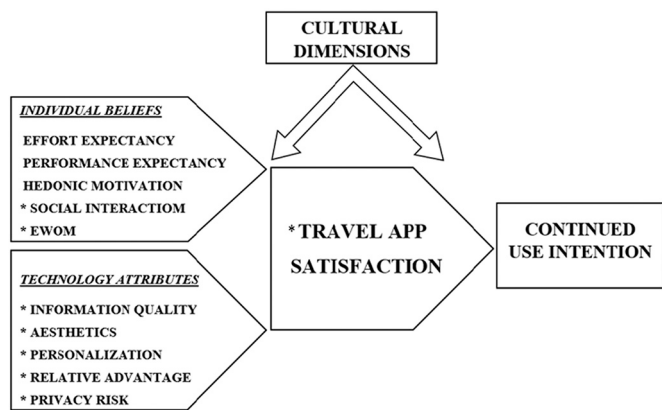


Fig. 1. Theoretical model.

* New variables added to UTAUT2 to study continued travel-app use.

Numerous theories and models have been used in behavioral studies examining information-technology adoption and continued use. According to authors including Venkatesh, Thong, and Xu (2016) or Oliveira and Martins (2011), the key approaches are Innovation Diffusion Theory (IDT)/Diffusion of Innovations (DOI) theory (Rogers, 2003), the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), TAM (Davis, 1989), the Technology–Organization–Environment (TOE) framework (Tornatzky & Fleischer, 1990), the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Information Systems Success (ISS) model (DeLone & McLean, 2003), ECM-IS (Bhattacharjee, 2001), UTAUT (Venkatesh, Morris, Davis, & Davis, 2003) and UTAUT2 (Venkatesh et al., 2012), among others. However, in the case of mobile apps, the general trend has been to study their adoption and initial use rather than their continued use. This is problematic because almost half of all apps downloaded are deleted shortly afterward—that is, without the consumer having made continuous use of them (Fang et al., 2017). As observed by Hsieh, Rai, and Keil (2008), although the initial acceptance of a technology is important, this does not guarantee its continued use; and the long-term viability of a new information technology depends more on users' continuity behavior than on their initial adoption decisions (Venkatesh, Thong, Chan, Hu, & Brown, 2011).

In the context of travel apps, despite the importance of continued use, there is little literature on this topic. Among the outstanding exceptions is the work of Weng, Zailani, Iranmanesh, and Hyun (2017), which studied continued-use intention for a mobile taxi-booking app based on the TAM and ECM-IS model. Joia and Altieri (2018) also studied continued-use intention for e-hailing apps, combining the TAM, TRA, and IDT models. Choi, Wang, and Sparks (2019) and Liu, Li, Edu, and Negricea (2020) studied continued travel-app use in general, using the ECM-ISS. Filieri, Acikgoz, Ndou, and Dwivedi (2020) observed continued use of TripAdvisor using the TAM and ECM-IT. Using the UTAUT model, Fong, Lam, and Law (2017) and Ozturk, Nusair, Okumus, and Hua (2016) studied continued-use-intention for hotel reservation apps. The present research aims to advance on the literature dealing with continued travel-app use by proposing a model based on the UTAUT2. We take this as our baseline model as it has not been used previously to study continued travel-app use. According to our literature review, it has also attracted the attention of e-Tourism researchers (Pourfakhimi, Duncan, Ould, Allan, & Coetzee, 2020) for the following reasons:

1. The UTAUT2 model, unlike other models such as TRA and TPB (Ajzen, 1991), brings together eight theories of technology acceptance and consumer behavior. Unlike its predecessor UTAUT, which was proposed for organizational environments, UTAUT2 was developed for the context of mobile Internet consumption (Venkatesh et al., 2012).

Table 1
Variables included in the model.

BLOCKS	VARIABLE	DEFINITION
Individual beliefs	Effort expectancy	The “degree of ease associated with consumers’ use of technology” (Venkatesh et al., 2012, p. 159). This construct is equivalent to the TAM’s perceived ease of use (Saadé & Bahli, 2005; Tam et al., 2020; Venkatesh et al., 2003).
	Performance expectancy	The “degree to which technology will provide benefits to consumers in performing certain activities” (Venkatesh et al., 2012, p. 159). This factor is similar to the TAM’s perceived utility (Pynoo et al., 2011; Venkatesh et al., 2003).
	Hedonic motivation	The “fun or pleasure derived from using technology” (Venkatesh et al., 2012, p. 161).
	e-WOM	Other users’ evaluations of an app, based on informal communication between individuals about the characteristics, properties, and use of the technology (Kim, Kankanhalli, & Lee, 2016; Litvin, Goldsmith, & Pan, 2008).
	Social Interaction	The “degree to which a user perceives that the mobile application enables users to connect with other individuals” (Hoehle & Venkatesh, 2015, p.14).
Contextual factors/ technology attributes	App aesthetics	Users’ perception of the attractiveness of a travel app’s interface, derived from user interface design factors, color schemes, spatial design details, and shape-selection (Fang et al., 2017).
	Information quality	The extent to which an app provides the user with useful, complete, accurate, relevant, up-to-date, and timely information (DeLone & McLean, 2003; Hoehle & Venkatesh, 2015).
	Personalization	The ability to understand the needs and preferences of users of a technology, facilitating tailored content and services and generating personalized interaction (Adomavicius & Tuzhilin, 2005; Jung et al., 2015).
	Relative advantage	The “degree to which an innovation is perceived as better than the idea it supersedes” (Rogers, 2003 p. 15).
Satisfaction	Travel app satisfaction	Privacy risk is associated with the incorrect use of travel-app user information or its use without the express consent of the app’s providers (Featherman & Pavlou, 2003; Hsiao, Lin, Wang, Lee, & Zhang, 2019; Xu et al., 2015).
	App continued-use intention	Consumers’ perception of overall consumption when they use travel apps (Hsiao, Chang, & Tang, 2016).
Continued use	App continued-use intention	Intention to continue using a travel app over time (Bhattacharjee, 2001; Yoon & Rolland, 2015).

Source: The authors.

2. It completes the original UTAUT model with variables such as habits and hedonic motivations that are not included in models such as the TAM, TPB, or TRA (Legris, Ingham, & Collerette, 2003). UTAUT2 also includes moderating variables of the relationships, such as experience, gender, and age (Venkatesh et al., 2012).

Table 2
Cultural dimensions and technology acceptance.

Cultural dimensions (Hofstede et al., 2010)	Characteristics of the cultural dimensions that influence technology acceptance	Effect of cultural dimensions on technology acceptance	Authors
Individualism/ Low uncertainty avoidance	Flexibility, independence, freedom, risk-taking, and tolerance	Positive influence	Gales (2008); Kedia and Bhagat (1988); Steenkamp, Ter Hofstede, and Wedel (1999); Shore and Venkatachalam (1996); Van Everdingen and Waarts (2003); Yaveroglu and Donthu (2002). Gales (2008); La Ferle, Edwards, and Mizuno (2002); Steenkamp et al. (1999); Yeniyurt and Townsend (2003).
Collectivism/ High uncertainty avoidance	Joint decision-making, loyalty, security, adherence to customs and traditions, conservatism, resistance to change	Negative influence	

Source: The authors.

3. UTAUT and UTAUT2 explained 70% of variance in technology use intention (Venkatesh et al., 2016), compared to 40% for models such as the TRA, TPB, and TAM (Venkatesh et al., 2003).

Following the recommendations of Venkatesh et al. (2016) on the need to expand the UTAUT framework, in the present research, an extended version of the UTAUT2 model is proposed (Fig. 1).

As recommended by Venkatesh et al. (2016), the model is extended by including the following variables: individual beliefs, contextual factors (Technology Attributes), and app satisfaction, with culture as a moderating variable. Table 1 shows the variables included in the model. First, the variables identified as individual beliefs (from the baseline UTAUT2 model) are effort expectancy, performance expectancy, and hedonic motivations (Fong et al., 2017; Gupta et al., 2018; Lai, 2015). Updating Social Influence, two newer constructs adapted to the app environment are added: e-WOM (Tandon, Aakash, & Aggarwal, 2020) and interaction between users (Hoehle & Venkatesh, 2015; Sigala, 2015).

Second, contextual factors (Technology Attributes) such as the aesthetics of the app, information quality, personalization, relative advantage, and privacy risk are added (Hoehle & Venkatesh, 2015; Joia & Altieri, 2018; Jung, Chung, & Leue, 2015; Xu, Peak, & Prybutok, 2015). Third, satisfaction with the travel app is added to the model as a direct antecedent of continued-use intention (Alalwan, 2020; Choi et al., 2019; Liu et al., 2020; Tam, Santos, & Oliveira, 2020). This variable derives from the ECM-IS model of continued technology use (Bhattacharjee, 2001) and is included in our research in response to the suggestion of Venkatesh et al. (2016) to integrate the UTAUT/UTAUT2 baseline model with other theories to examine the impact on technology acceptance. Lastly, the inclusion of culture as a moderating variable in the model is proposed in the form of the cultural dimensions of individualism and uncertainty avoidance (Franque, Oliveira, Tam, & de Oliveira Santini, 2020; Hoehle et al., 2015; Lee, Chung, & Jung, 2015) (Table 2).

3. The moderating effect of culture

Hofstede et al. (2010, p. 6) define culture as “the collective programming of the mind that distinguishes the members of one group or category of people from others”. This cultural framework is the most

widely used in cross-cultural research (Soares, Farhangmehr, & Shoham, 2007). According to Hofstede, culture comprises six dimensions: power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long-term vs. short-term orientation, and indulgence vs. restraint (Hofstede et al., 2010). However, several different authors have confirmed that the dimensions of individualism/collectivism and uncertainty avoidance are the most influential in technology acceptance (Lee, Trimi, & Kim, 2013; Leidner & Kayworth, 2006; Yeniyurt & Townsend, 2003) and in the context of apps (Chopdar, Korfiatis, Sivakumar, & Lytras, 2018; Hoehle et al., 2015; Qin, Kim, & Tan, 2018). The individualism/collectivism dimension refers to the relationship between the group and the individual, and the individual's role in society. The uncertainty-avoidance dimension refers to the degree to which a person would take measures to avoid something they perceive to be uncertain (Hofstede et al., 2010). Table 2 shows the influence that the cultural dimensions developed by Hofstede exert on technology acceptance. Authors such as Van Everdingen and Waarts (2003) or Yaveroglu and Donthu (2002) argue that individualism and low uncertainty avoidance positively influence the acceptance of innovations, based on characteristics linked to these cultures, such as flexibility or independence. In contrast, uncertainty-avoidant and collectivist cultures that are associated with resistance to change and the need for security tend to adopt innovations and new technology to a lesser degree (Gales, 2008; Yeniyurt & Townsend, 2003).

In light of the influence of culture on technology acceptance and based on a review of the literature dealing with cross-cultural studies and technology acceptance and use, we can confirm that several of the relationships proposed in the theoretical research model (Fig. 1) have already been studied and confirmed. Table 3 presents the relationships that different authors have shown to be *unaffected* by culture. First, according to the literature, performance expectancy, eWOM, and relative advantage all exert an influence on travel app satisfaction, but these relationships are not moderated by culture (Arpaci, Yardimci Cetin, & Turetken, 2015; Chopdar et al., 2018; Foster, Styvén, Wallström, & Engström, 2017). Second, effort expectancy and information quality both influence performance expectancy, but, again, culture does not moderate these relationships (Lin, Wu, Lim, Han, & Chen, 2019; Lu, Liu, & Wei, 2017). Third, while the aesthetics of the app have a clear influence on hedonism, once again, culture does not moderate this relationship (Jung et al., 2018). Finally, travel app satisfaction influences continued-use intention, but this relationship is not moderated by culture (Franque et al., 2020).

Based on the above, we propose hypotheses for those relationships that have not been examined previously in the literature and have not been tested to determine whether they are affected by cultural dimensions. Fig. 2 represents the research model where these relationships can be observed.

In this regard, authors such as Filieri et al. (2020) have confirmed the influence of ease of use of a tourism platform, such as TripAdvisor, on customer satisfaction. Turning to the effect of effort expectancy on satisfaction with a travel app, this may be affected by the culture of the tourist. As reflected in the results of different studies (Chopdar & Sivakumar, 2019; Hung & Chou, 2014; Im et al., 2011; Zhang, Weng, & Zhu, 2018), societies that are more individualistic and less uncertainty-avoidant are more predisposed to using innovative technologies, especially if these are easy to use. Therefore, tourists from such societies are likelier to be more open to using a travel app and more satisfied with it if it is easy to use. In contrast, according to authors such as Al-Gahtani, Hubona, and Wang (2007) and Merhi, Hone, and Tarhini (2019), in the most collectivistic and uncertainty-avoidant cultures, the influence of ease of use or effort expectancy will not be significant. This is because, if individuals perceive the benefits of using the technology to be high, it will not matter how difficult it is to use. Based on the above, the following research hypothesis is proposed:

H1. *The positive effect of effort expectancy on satisfaction with the travel*

Table 3
Relationships.

	Relations
Performance expectancy → Travel app satisfaction	<p>Liu et al. (2020) confirm this relationship for a travel app used by Chinese tourists. There are no differences between cultures because, as confirmed by Im, Hong, and Kang (2011) and Tam et al. (2020), performance expectancy is considered the most important determining factor in user behavior in terms of technology acceptance. This finding is in line with the work of Chopdar et al. (2018).</p> <p>Various authors confirm this relationship for apps in the tourism field (Lai, 2015; Lee, Chen, & Su, 2017). It has been found to be a very important relationship in the framework of technology acceptance (Pavlou, 2003; Venkatesh & Davis, 2000); and, according to previous works dealing with apps, there are no cultural differences (Lee et al., 2015; Lu et al., 2017).</p> <p>There are no studies analyzing the influence of culture on this relationship, but all tourists—no matter where they are from—need quality information about a destination to make the most of the tourism experience or minimize risks. Therefore, culture should not affect this relationship. Authors such as Lin et al. (2019) confirm this in their study on mobile payment. Lee et al. (2015) demonstrates that the aesthetic characteristics of an augmented reality travel app influence hedonic perceptions. If an individual, regardless of their culture of origin, perceives the aesthetics and design of a travel app to be of quality, this will have a positive influence on their enjoyment of the app. Therefore, culture does not moderate this relationship. This is in line with other studies dealing with tourism-related mobile technology (Jung et al., 2018).</p>
Effort expectancy → Performance expectancy	<p>No studies, to date, have observed this relationship, but authors such as Tandon et al. (2020) have confirmed the influence of the e-WOM of an e-shopping website on user satisfaction with e-commerce. Jalilvand and Samiei (2012) also confirmed the influence of e-WOM on attitudes toward visiting a tourist destination. Culture does not affect this relationship because, as suggested by Foster et al. (2017), consulting the opinions of other users is now a widespread practice in the tourism and mobile sectors in any society and culture.</p>
Information quality → Performance expectancy	<p>While there is no literature in the tourism sphere on this relationship, it is confirmed in studies dealing with smartphones (Lin, Huang, & Hsu, 2015) and apps (Joia & Altieri, 2018). This is because travel apps are ubiquitous, which gives them an insurmountable advantage over other technologies. As this is important for any culture, there will be no differences between cultures. Other cross-cultural studies examining smartphone acceptance (Arpaci et al., 2015) or technology acceptance (Carter & Weerakkody, 2008) also suggest this.</p> <p>Liu et al. (2020) and Choi et al. (2019) have confirmed this relationship. The influence of culture has not been studied in this context but, if a tourist is satisfied with the app, they used during their tourism experience and it helped them to enhance and get the most out of their trip, it is most likely that they will continue to use it, regardless of their culture of origin. Franque et al. (2020) conducted a meta-analysis of the quantitative studies dealing with continued-use intention for an information system (IS). Their results confirmed that satisfaction with an IS is an important predictor of continued-use intention and that the cultural dimensions of individualism/collectivism and uncertainty do not moderate this relationship.</p>
Aesthetics → Hedonism	
e-WOM → Travel app satisfaction	
Relative advantage → Travel app satisfaction	
Travel app satisfaction → Continued-use intention	

Source: The authors.

app is moderated by culture, such that this effect will be significant among tourists from individualistic, low-uncertainty-avoidance cultures and not significant among those from collectivistic cultures with high uncertainty avoidance.

In the tourism context, Lai (2015) confirmed the influence of information quality on the effort expectancy of an app-based mobile tour guide. In the cross-cultural sphere, there is no previous research that has studied the influence of cultural dimensions on the relationship between the information quality of travel apps and effort expectancy. However, people from individualistic, low-uncertainty-avoidance cultures are more predisposed to accepting technology (Steenkamp et al., 1999; Yaveroglu & Donthu, 2002) and to innovate in their tourism experience (Litvin & Kar, 2004; Money & Crotts, 2003). Conversely, users from collective and uncertainty-avoidant cultures are more reluctant to accept technology and, as tourists, are less innovative (Gales, 2008; Manrai & Manrai, 2011; Yenyurt & Townsend, 2003). Therefore, if the information in the travel app is of high quality and is reliable and relevant, the app's ease-of-use increases (Lai, 2015). For this reason, tourists from collectivistic cultures characterized by high uncertainty avoidance will attach more importance to information quality as it facilitates technology use and also reduces the stress and uncertainty derived from the difficulty of using the travel app. Based on the above, the following research hypothesis is proposed:

H2. *The positive effect of the information quality of the travel app on effort expectancy is moderated by culture, such that this effect will be greater among tourists from collectivist, high-uncertainty-avoidance cultures than among tourists from individualistic cultures with low uncertainty avoidance.*

In addition, previous studies on tourism show that hedonism influences mobile telephony acceptance (Law et al., 2018). Choi et al. (2019) confirmed that the perceived hedonic benefits of a travel app influence satisfaction with the app because most travel apps offer games, prizes, and other challenges to amuse and entertain tourists. They can also make the trip more enjoyable, thanks to the information they provide on places of interest or personalized suggestions for activities at the destination. However, in the context of travel apps, no authors, to date, have addressed the influence of cultural dimensions on this relationship. According to Lee et al. (2015) and Jung et al. (2018), in their cross-cultural studies on augmented-reality apps in tourist sites, the influence of entertainment on use intention is greater in collectivistic and uncertainty-avoidant societies. Elsewhere, in a cross-cultural study by Dwivedi, Shareef, Simintiras, Lal, and Weerakkody (2016), the authors found that the influence of hedonic motivations on the intention to use a mobile healthcare service system was greater in collectivistic and high uncertainty avoidance cultures. This can be explained by these countries' greater experience in the use of virtual media. In a similar vein, the cross-cultural study on mobile banking conducted by Merhi et al. (2019) observed that hedonic motivations have no influence on technology use intention among British (individualistic and low-uncertainty-avoidant) consumers. This is because, for such consumers, using this technology has become a habit that is no longer associated with pleasure or fun. Based on the above, the following research hypothesis is proposed:

H3. *The positive effect of hedonic motivations on satisfaction with the travel app is moderated by culture, so that this influence will be significant for tourists from collectivistic cultures and with high uncertainty avoidance, and not significant for individualistic tourists and with low uncertainty avoidance.*

The literature review also shows that, in the sphere of travel apps, there are no studies confirming the relationship proposed in the present research model between social interactions and e-WOM. However, Wang, Zhang, Suomi, and Sun (2017) confirmed the positive influence of social interaction on e-WOM-generation on a travel review website, as the interaction creates the context for active communication (Yadav & Varadarajan, 2005). Therefore, a relationship between tourist interaction and e-WOM is to be expected

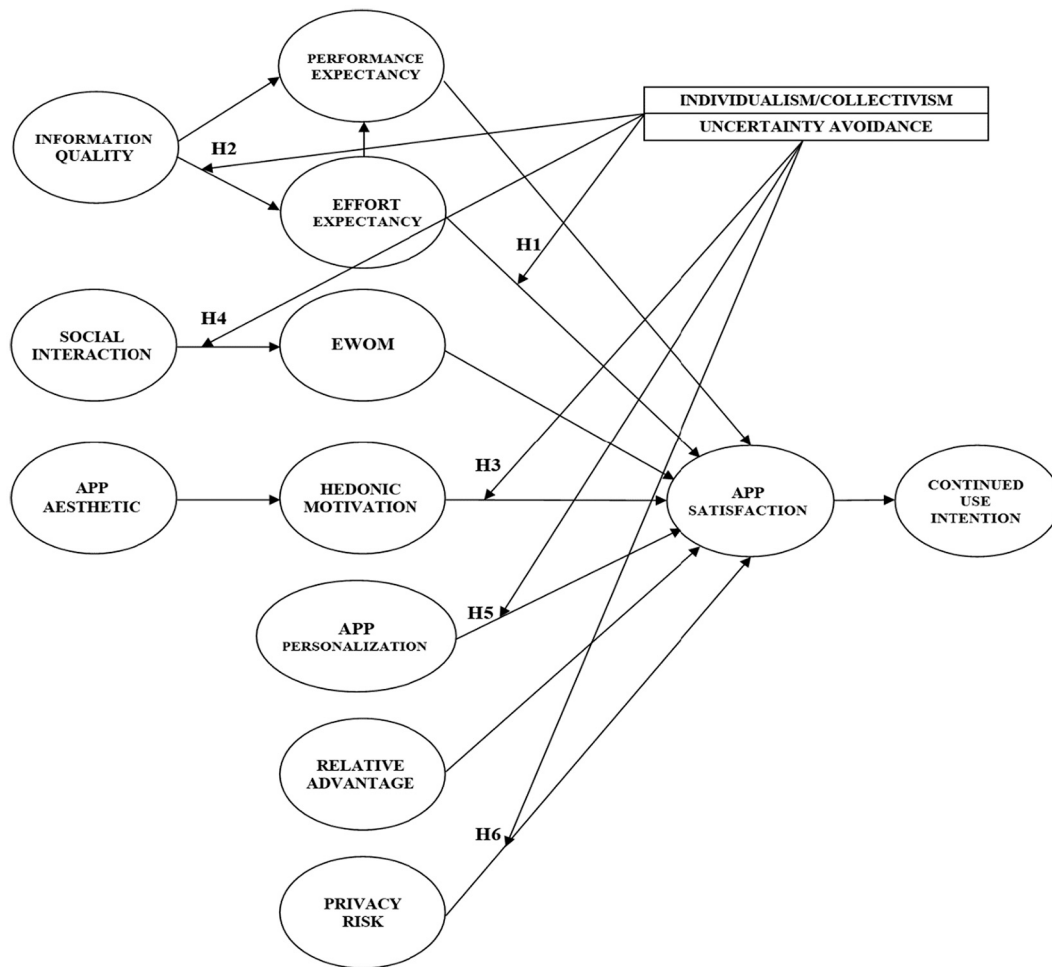


Fig. 2. The research model.

because, to generate e-WOM in a travel app, there must first be interaction between users. However, the influence of culture on this relationship has not been studied, to date. People from collectivistic cultures place great importance on the “we” rather than the individual “me”, and feel a strong sense of dependence on the group, which is characterized by close ties between individuals (Hofstede et al., 2010). Srite and Karahanna (2006) noted that people with high individualism are less affected by the opinion of others, while those with high collectivistic cultural values tend to follow the opinions of their reference groups. Interaction with the group has been found to be closely associated with dependence on others to provide satisfaction with the tourist experience (Huang & Crotts, 2019). In cultures with low risk-tolerance, people endeavor to plan ahead and anticipate what is going to happen (Triandis, 2004). Therefore, it is to be expected that, in a collectivistic and uncertainty-avoidant society, there will be more interaction between the users of the travel app and that the influence of this interaction on e-WOM will be greater than in the case of individualistic cultures, which are more associated with tourists’ autonomy while traveling and higher tolerance of risk (Manrai & Manrai, 2011; Money & Crotts, 2003). Based on the above, the following hypothesis is proposed:

H4. *The positive effect of social interaction on e-WOM is moderated by culture, such that this effect will be greater among tourists from collectivistic, high-uncertainty-avoidance cultures than among individualistic tourists with low uncertainty avoidance.*

In the tourism field, there are very few studies that have analyzed the influence of personalization on mobile marketing acceptance (Kang &

Namkung, 2019). More specifically, there are no extant studies that observe the influence of personalization on satisfaction with a travel app. However, tourists want to receive information adapted to their needs and tastes to facilitate their activities at the destination. Therefore, the fact that an app can provide the tourist with information tailored to their preferences regarding their tourism experience is important for users to feel satisfied with the app. In a similar vein, there are no previous works examining the influence of culture on this relationship. Dai and Palvi (2009) suggest that consumers from individualistic cultures will use mobile services to demonstrate their individuality and will choose to use more personalized services, while collectivistic consumers may tend to use services that enable them to feel better connected with others. This is because tourists from individualistic, low-uncertainty-avoidance cultures will seek apps that can be customized, since the technology will be adjusted to their particular needs and tastes and it will be easier to source innovative activities that help them immerse themselves in the destination they are visiting; and they will find it easier to tolerate the risk and stress that this immersion may produce (Kim & Lee, 2000; Manrai & Manrai, 2011). On the other hand, tourists from collectivistic cultures characterized by high uncertainty avoidance will not attach any importance to personalization in the travel app, as they tend to put common goals and tastes before their own (Hofstede et al., 2010). What is more, the customization of this software involves a privacy risk, due to the transfer of data. Based on the above, the following research hypothesis is proposed:

H5. *The positive effect of personalization on satisfaction with the travel app is moderated by culture, such that this influence will be significant among*

tourists from individualistic, low-uncertainty-avoidance cultures and not significant among collectivistic tourists with high uncertainty avoidance.

Finally, privacy risk is included in the research model as an antecedent of satisfaction with the travel app. Privacy risk is a prominent variable in the field of technology acceptance and is known to negatively influence travel-app use intention (Fong et al., 2017; Gupta et al., 2018). However, there are no studies, to date, that examine the relationship between privacy risk and satisfaction with a travel app. Tourists who wish to receive more personalized information regarding products, services, or activities on offer at the destination must share certain private information with the app, such as preferences, tastes, locations, or past experiences. While the sharing of this information enables the app to adapt its focus to each individual tourist's interests, Hsu and Chiu (2004) found that technologies with insufficient or unreliable security will increase users' risk perception, which will lead to lower satisfaction and less willingness to continue using the technology in a context of e-commerce. Therefore, if a tourist perceives their personal information to be at risk when using a travel app, their satisfaction with that app is likely to be lower. There are no studies examining the influence of cultural dimensions on this relationship, but authors such as Chopdar et al. (2018) have empirically verified that culture does moderate the relationship between privacy risk and shopping-app use intention, this being greater in collectivistic, uncertainty-avoidant cultures. Tourists from such societies are likely to be more concerned about the security of their data and information; hence, on the premise of cultural differences, the influence of privacy on satisfaction with the travel app should be greater among collectivistic tourists. Based on the above, the following research hypothesis is proposed:

H6. *The negative effect of privacy risk on satisfaction with the travel app is moderated by culture, such that this effect will be greater among tourists from collectivistic, high-uncertainty-avoidance cultures than among individualistic tourists with low uncertainty avoidance.*

4. Methodology

4.1. Sample design and data-collection

The initial sample comprised 500 tourists (250 Spanish and 250 British) who had used a travel app during a trip made in the six months prior to the survey. The participants were selected via a panel of Internet users managed by Dynata SL. The fieldwork was conducted from November 26 to 29, 2019, based on a self-administered questionnaire organized by the online panel.

To detect any atypical cases, the Mahalanobis distance was used (Hair, Black, Babin, & Anderson, 2018), resulting in a final sample of 482 individuals (243 Spanish tourists and 239 British). Subsequently, as two different nationalities were involved, the sample was standardized to eliminate cross-cultural differences that were not due to the variables under study, but rather to the response sets and the methodological instruments (Dolnicar & Grün, 2007; van de Vijver & Leung, 1997).

Table 4 presents the scores for the Hofstede cultural dimensions of individualism/collectivism and uncertainty avoidance for Spain and the United Kingdom (UK). For this cross-cultural study, a sample comprising Spanish and British tourists was chosen because they represent countries that present significant differences in the scores for these two cultural dimensions. In addition, the United Kingdom is one of the main sending

Table 4
Cultural scores.

Cultural dimensions	Scores	
	Spain	UK
Individualism	51	89
Uncertainty avoidance	86	35

Source: <https://www.hofstede-insights.com/product/compare-countries/>

countries of inbound tourists to Spain (National Institute of Statistics of Spain, 2021). Therefore, it is important for researchers and professionals alike to understand in some depth the behavior of these tourists, by observing how they adapt to cultures other than their own. This understanding will have a beneficial effect on the Spanish tourism sector, as it will enable it to better tailor its services to the needs and preferences of these tourists.

Of the total sample, 41.7% were women and 58.3% were men. 65% of those surveyed were over 35 years old. Half (54.14%) of the respondents had studied to university level. The monthly income in the sample was €1500–€2499 (30%) and €2500–€3499 (26%). The majority of those surveyed work full time (59%), They are married (64.7%), and usually travel accompanied by their partner (66.2%). According to the results presented in Table 5, it can be concluded that most of the sociodemographic variables are equal across the Spanish and British groups and, therefore, that no bias is being introduced into the research. That said, differences between groups are present in the gender and age variables. Therefore, as can be seen in Appendix 1, gender and age were incorporated into the research model as control variables (Zhang, Li, Liu, & Ruan, 2019). The results shown in Appendix 2 indicate that there are no significant differences in the relationships, comparing the original research model to the model in which the control variables are included. For this reason, we opted to retain the model without the control variables as it is more parsimonious.

4.2. Measurement scales

The Questionnaire used in the research can be seen in Appendix 3. The scales selected to measure the variables included in the research were identified from the literature review. To measure effort expectancy, performance expectancy, and hedonism, the UTAUT2 scales were adapted (Venkatesh et al., 2012). Information quality was measured on a scale adapted from Noh and Lee (2016), derived from previous works on technology acceptance (DeLone & McLean, 2003). Social Interaction was measured using a scale adapted from studies on apps and tourism (Hoehle & Venkatesh, 2015; Sigala, 2015). To measure the aesthetics of a travel app, a scale adapted from Xu et al. (2015) was applied. In the case of the e-WOM of a travel app, a scale adapted from Kim et al. (2016) was used, the original having been based on the work of Hennig-Thurau, Gwinner, Walsh, and Gremler (2004). To measure the personalization of a travel app, a scale adapted from Jung et al. (2015) was used. Privacy risk was measured using an adapted scale, proposed for a hotel app environment by Fong et al. (2017). Relative advantage was measured using a scale adapted from Lu, Yang, Chau, and Cao (2011). To measure satisfaction with the travel app, a scale adapted from Xu et al. (2015) was used, the original being based on previous research on technology satisfaction (Bhattacharjee, 2001) and consumer satisfaction (Oliver, 1980; Spreng, MacKenzie, & Olshavsky, 1996). Finally, tourism-app continued-use intention was measured on a scale adapted from previous research dealing with technology acceptance and continued use (Bhattacharjee, 2001; Venkatesh et al., 2012). All measurements were made on 7-point Likert scales, where 1 indicated “entirely disagree” and 7 “entirely agree”.

Table 5
Test Chi-square.

Pearson's Chi-square	Value	gl	Asymptotic significance (bilateral)
Gender	8.378	1	0.04
Travel companion(s)	1.86	1	0.173
Age	156.39	6	0.00
Marital status	0.053	1	0.818
Employment status	1.908	1	0.167
Income level	0.834	1	0.361
Education	2.052	1	0.152

5. Results

5.1. Analysis of the validity of the measurement scales

Before testing the hypotheses, the scales of the constructs were validated by confirmatory factor analysis (CFA). The maximum likelihood estimation method (MLM) was used for this purpose, as the sample did not follow a normal distribution (Bollen, 1989). As shown in Table 6, the model presented an acceptable level of individual reliability, since the relationship between each item and its respective dimension was statistically significant and the standardized loads were greater than 0.5 in all cases (Anderson & Gerbing, 1988). Regarding internal consistency, the composite reliability (CR) values were higher than 0.70; and those of the variance extracted (AVE) were higher than 0.50 (Hair et al., 2018). Therefore, the measurement model can be considered reliable. In turn, the discriminant validity of the scales of the variables was verified.

Discriminant validity is obtained if the correlations between the dimensions are less than the square root of the AVE of each variable. It can be seen that the square roots of all the AVEs are greater than the elements that are not presented on the diagonal (Table 7). Therefore, the measured variables are shown to have discriminant validity.

5.2. Testing the hypotheses

To test the research hypotheses, the psychometric properties of the

proposed model were estimated and evaluated. A structural equation model (SEM) (Fig. 2) was used, using the maximum likelihood estimation method combined with bootstrapping (Yuan & Hayashi, 2003). The software used for data analysis was RStudio 1.3.959. The results of the research model indicated acceptable fit indices ($\chi^2(1695) = 3774.050$, $p = 0.000$; CFI = 0.91; NFI = 0.84, NNFI = 0.9, IFI = 0.90, TLI = 0.90, RMSEA = 0.07). Table 8 shows the results of the analysis. We can verify that the relationships previously studied and tested in the literature (Table 3) are also confirmed in this study. Effort expectancy, eWOM, and relative advantage all exert a direct, positive, and significant influence on travel app satisfaction, regardless of culture. Effort expectancy and information quality have a direct, positive, and significant influence on performance expectancy, and there are no differences in these relationships across the two groups (Spanish vs. British). In addition, culture does not moderate the influence of aesthetics on eWOM, or satisfaction on continued-use intention.

Effort expectancy has a direct, positive and significant influence among the British tourists ($\beta = 0.244$, $p = 0.00$) and is not significant for the Spanish ($\beta = 0.092$, $p = 0.36$). Thus, H1 receives empirical support, and the cultural dimensions of uncertainty avoidance and individualism/collectivism moderate the relationship. Information quality positively and significantly influences effort expectancy among both Spanish ($\beta = 0.866$, $p = 0.00$) and British ($\beta = 0.588$, $p = 0.00$) tourists, but it is confirmed that there are cultural differences ($p = 0.09$) and that the influence is greater for Spanish tourists (whose society is characterized by greater uncertainty

Table 6
Confirmatory factor analysis.

Causal relationships		Standardized estimators	z	p	CR	AVE
APPSAT1	←	APPSAT	0.89	–	–	
APPSAT2	←	APPSAT	0.90	29.85	0.00	0.93
APPSAT3	←	APPSAT	0.89	28.15	0.00	
APPSAT4	←	APPSAT	0.85	23.40	0.00	
INFOQUAL1	←	INFOQUAL	0.81	–	–	
INFOQUAL2	←	INFOQUAL	0.88	22.42	0.00	0.91
INFOQUAL3	←	INFOQUAL	0.86	21.53	0.00	
INFOQUAL4	←	INFOQUAL	0.86	18.16	0.00	
INTERACT1	←	INTERACT	0.81	–	–	
INTERACT 2	←	INTERACT	0.88	23.01	0.00	0.93
INTERACT 3	←	INTERACT	0.91	22.06	0.00	
INTERACT 4	←	INTERACT	0.89	20.32	0.00	
EE1	←	EE	0.82	–	–	
EE2	←	EE	0.91	20.46	0.00	0.93
EE3	←	EE	0.91	19.46	0.00	
EE4	←	EE	0.86	19.90	0.00	
PE1	←	PE	0.81	–	–	
PE2	←	PE	0.89	23.16	0.00	0.9
PE3	←	PE	0.86	20.65	0.00	
PE4	←	PE	0.78	16.08	0.00	
AESTHET1	←	AESTHET	0.86	–	–	
AESTHET2	←	AESTHET	0.88	34.12	0.00	0.93
AESTHET3	←	AESTHET	0.89	29.70	0.00	
AESTHET4	←	AESTHET	0.87	28.10	0.00	
AESTHET5	←	AESTHET	0.81	21.38	0.00	
EWOM1	←	EWOM	0.81	–	–	
EWOM2	←	EWOM	0.87	18.48	0.00	0.88
EWOM3	←	EWOM	0.86	16.24	0.00	
HEDON1	←	HEDON	0.89	–	–	
HEDON2	←	HEDON	0.92	32.74	0.00	0.92
HEDON3	←	HEDON	0.88	30.32	0.00	
CUSEINT1	←	CUSEINT	0.86	–	–	
CUSEINT2	←	CUSEINT	0.90	23.12	0.00	0.9
CUSEINT3	←	CUSEINT	0.86	23.28	0.00	
PERSONALIZ1	←	PERSONALIZ	0.85	–	–	
PERSONALIZ2	←	PERSONALIZ	0.89	27.89	0.00	0.9
PERSONALIZ3	←	PERSONALIZ	0.86	23.67	0.00	
PRIVRISK1	←	PRIVRISK	0.82	–	–	
PRIVRISK2	←	PRIVRISK	0.87	20.76	0.00	0.9
PRIVRISK3	←	PRIVRISK	0.90	23.39	0.00	
RELADV1	←	RELADV	0.83	–	–	
RELADV2	←	RELADV	0.88	25.32	0.00	0.89
RELADV3	←	RELADV	0.86	22.36	0.00	

Table 7
Evaluation of discriminant validity.

VARIABLES	PERSONALIZ	PRIVRISK	AESTHET	INTERACT	INFOQUAL	RELADV	EE	HEDON	PE	EWOM	APPSAT	CUSEINT
PERSONALIZ	0.880											
PRIVRISK	-0.102	0.860										
AESTHET	0.864	-0.147	0.860									
INTERACT	0.808	-0.101	0.762	0.870								
INFOQUAL	0.838	-0.142	0.818	0.695	0.850							
RELADV	0.693	-0.066	0.790	0.642	0.747	0.860						
EE	0.537	-0.091	0.524	0.445	0.640	0.478	0.870					
HEDON	0.736	-0.125	0.852	0.649	0.697	0.673	0.446	0.900				
PE	0.646	-0.110	0.631	0.536	0.771	0.576	0.733	0.537	0.830			
EWOM	0.617	-0.077	0.581	0.763	0.530	0.490	0.340	0.495	0.409	0.850		
APPSAT	0.794	-0.142	0.791	0.721	0.802	0.745	0.667	0.705	0.751	0.627	0.880	
CUSEINT	0.629	-0.112	0.627	0.571	0.635	0.590	0.529	0.558	0.595	0.497	0.792	0.870

Table 8
Relationships.

Regressions	SPAIN			UK			Differences test	Hypothesis
	Estim.	P	Z-value	Estim.	P	Z-value		
Performance expectancy → App satisfaction	0.3	0	3.599	0.165	0.009	2.619	0.17	-
Effort expectancy → App satisfaction	0.092	0.359	0.918	0.244	0	3.876	-	H1
Effort expectancy → Performance expectancy	0.561	0	5.278	0.399	0	3.703	0.21	-
Information quality → Performance expectancy	0.668	0	5.601	0.635	0	5.560	0.85	-
Information quality → Effort expectancy	0.866	0	12.224	0.588	0	5.340	0.09	H2
Hedonism → App satisfaction	0.222	0.012	2.522	0.046	0.499	0.676	-	H3
Aesthetics → Hedonism	0.952	0	16.777	0.931	0	16.494	0.77	-
EWOM → App satisfaction	0.162	0.006	2.731	0.23	0	4.320	0.5	-
Interaction → EWOM	1.011	0	12.954	0.644	0	10.056	0.008**	H4
Personalization → App satisfaction	0.056	0.7	0.385	0.27	0	3.102	-	H5
Relative advantage → App satisfaction	0.194	0.003	2.935	0.246	0	3.201	0.67	-
Privacy risk → App satisfaction	-0.005	0.813	-0.237	-0.063	0.092	-1.687	-	H6
App satisfaction → Continued-use intention	0.844	0	15.832	0.67	0	10.583	0.11	-

Signif. codes: 0 '*****' 0.001 '****' 0.01 '***' 0.05 '**' 0.1 '*' 1 '.'

avoidance and collectivism than the British society, which is characterized as more individualistic and not uncertainty-avoidant. Therefore, H2 obtains empirical support, and it can be affirmed that the cultural dimensions of individualism/individualism and uncertainty avoidance moderate the relationship. H3 is also confirmed, as hedonic motivations were found to have a positive and significant influence among Spanish tourists ($\beta = 0.222, p = 0.012$) but not among British tourists ($\beta = 0.046, p = 0.5$). Therefore, the relationship is moderated by culture. Interaction has a direct, positive and significant effect for both Spanish ($\beta = 1.011, p = 0.00$) and British ($\beta = 0.644, p = 0.00$) tourists. From the results of the ANOVA analysis/nested models ($p = 0.008$), it can be seen that there are differences between the two groups, the greatest influence being among Spanish tourists. H4 therefore obtains empirical support, confirming that cultural dimensions moderate this relationship. Personalization has a positive and significant influence in the case of British tourists ($\beta = 0.27, p = 0.00$), whereas the relationship is not significant in the case of Spanish tourists ($\beta = 0.056, p = 0.7$). H5 is therefore confirmed, with cultural dimensions moderating this relationship. Finally, contrary to expectations, privacy risk exerts no significant influence on satisfaction with the travel app for either of the two groups. Therefore, H6 does not receive empirical support.

6. Conclusion

6.1. Theoretical implications

Travel apps have significantly changed behaviors and processes in the tourism experience (Wang et al., 2016). In addition, travel-app acceptance and continued use, as well as tourist behavior, are affected by culture. Therefore, it is important to continue researching the variables that affect behavior in terms of continued travel-app use and to better understand how tourists' culture may influence their relationship with technology. Based on these premises, the present work makes

several contributions to the literature.

First, this research contributes to improving and expanding the study of continued technology use by proposing a model of travel-app use continuance. Importantly, most studies deal with initial adoption, but, in today's hyper-connected and technologically-aware society, this focus provides an incomplete picture of real usage. Any smartphone user will have been familiar with the use of apps for some time; hence, the more valuable factor to study is *continued* app use, given that individuals tend to stop using most apps after their first experience of them (Fang et al., 2017). Second, based on the literature, a use-continuance model is proposed that includes a series of novel variables for studying continued travel-app use as antecedents of satisfaction with a travel app and continued-use intention. The results confirm the relationships previously identified in the literature. Third, culture is used as a moderating variable for the aforementioned relationships. According to different authors such as Leidner and Kayworth (2006) or Sabote-Ortiz, Frías-Jamilena, and Castañeda-García (2016), the cultural dimensions of individualism/collectivism and uncertainty avoidance are the best suited to studying consumer behavior from a cross-cultural perspective. Among the contributions of the present work to the literature in this regard, the following should be highlighted: a) effort expectancy has an influence on app satisfaction among tourists from individualistic, uncertainty-avoidant cultures (a finding that is aligned with other studies on technology acceptance) (Im et al., 2011; Zhang et al., 2018). However, for tourists from collectivistic, uncertainty-avoidant cultures, such as the Spanish, if this technology is useful to them during a trip, they will be satisfied with it regardless of how difficult it is to use. These results are similar to those obtained in previous cross-cultural studies on technology acceptance and use, which conclude that effort expectancy does not influence technology use intention (Al-Gahtani et al., 2007; Merhi et al., 2019); b) the influence of information quality on effort expectancy is significantly greater among Spanish tourists (that is, from

a more collectivistic culture, characterized by a high level of uncertainty avoidance). If tourists have access to high-quality information, it will facilitate the use of the travel app, which will help reduce risks and stress during the trip, and this is important for this type of culture (Manrai & Manrai, 2011). However, for the British, this feature will not be so important, since tourists from individualistic, low-uncertainty-avoidance cultures seek novel situations and are less concerned about taking the potential risks associated with a tourism experience (Money & Crotts, 2003); c) hedonism only has a significant influence on travel app satisfaction among tourists from collectivistic, uncertainty-avoidant cultures. In line with the findings of other authors, such as Lee et al. (2015) or Merhi et al. (2019), these tourists find using the app more enjoyable than tourists from individualistic, non-uncertainty-avoidant cultures such as the British, who are more familiar with this type of technology. For the latter, using such technology is not such much a fun experience but rather a routine activity, which ultimately affects app satisfaction; d) interaction has a greater influence on travel app satisfaction among Spanish tourists compared to British tourists. These results are derived from the fact that people from societies with high levels of individualism are less affected by the opinions of others (Huang & Crotts, 2019; Srite & Karahanna, 2006). Therefore, they will generate less e-WOM on the travel app. Furthermore, uncertainty-avoidant societies, such as that of Spanish tourists, will generate more e-WOM if there is more interaction between users. This is because they will also perceive less risk and experience less stress, as they will obtain more information about the destination directly from other tourists; e) personalization will only influence app satisfaction in the case of individualistic tourists who are not risk-averse, such as the British. This is because these tourists want personalized activities and services tailored to their preferences (Dai & Palvi, 2009), and they demand novel experiences that bring them closer to the local culture—which entails a degree of risk and stress. This is in direct contrast to the demands of tourists from less individualistic, uncertainty-avoidant cultures, as they prefer to avert uncertainty and take part in more group activities (Manrai & Manrai, 2011); f) in the case of privacy risk, contrary to expectations, this has no influence on app satisfaction, which is in line with other previous studies on apps (Hsiao et al., 2019; Oghuma, Libaque-Saenz, Wong, & Chang, 2016). This may be due to the fact that tourists offset the risk of sharing personal data, for example, by receiving tourist information that is personalized to their tastes in relation to a given trip, by being able to get the most out of the app, or by enjoying a tourism experience that is well-planned and coordinated at all times and in all locations. Some tourists are therefore prepared to take the risk because, in return, the benefits of using the travel app are much greater than the loss of privacy to which they are exposed.

6.2. Practical implications

Regarding the main professional contributions of this research, it should be noted that the use of smartphone technology and apps has revolutionized the tourist experience. Indeed, the destinations themselves increasingly use such technology, thus classifying themselves as

smart tourism destinations and enriching the tourist experience. Therefore, tourism service providers must take into account that the use of these tools will determine their competitiveness, especially taking into account the fact that the use of apps is something that tourists take for granted now in day-to-day life. Suppliers must offer these tools among their services and understand the characteristics and factors that determine their continued use. By doing so, app designers will be able to develop more effective tools that further enhance the use of tourist services delivered by providers and increase tourist satisfaction with the technology, with the provider, and with the destination. Additionally, app providers and designers should be aware that travel app acceptance differs from use continuance. Care must be taken to observe which factors and characteristics of these tools foster their continued use by tourists and ensure they are not discarded shortly after being downloaded, with the economic damage that this entails. Cultural differences can also act as a barrier that can impede travel-app acceptance and use continuance. Therefore, tourism service providers and app designers must take into account the characteristics that define users and tourists from particular cultures to design travel apps that are genuinely useful and enable tourists to derive the maximum benefit from their tourism experience, taking into account cultural differences.

6.3. Limitation and future research

Finally, the present research has certain limitations that point to potential future lines of research. First, tourists from other cultures who have used travel apps on their trips could be used to test the effect of cultural differences. Second, the inclusion of other variables in the model could be considered, as could other moderating variables in the user experience, such as smartphone dependence.

CRedit authorship contribution statement

Ángel L. Coves-Martínez: Conceptualization, Methodology, Writing – original draft, Visualization, Investigation, Formal analysis. Carmen M. Sabiote-Ortiz: Supervision, Data curation, Writing – review & editing, Software, Conceptualization. Dolores M. Frías-Jamilena: Supervision, Funding acquisition, Writing – review & editing, Project administration, Conceptualization.

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Appendix 1. Relationships in model with control variables (age and gender)

Regressions	SPAIN			UK			Differences test	Hypothesis
	Estim.	P	Z-value	Estim.	P	Z-value		
Performance expectancy → App satisfaction	0.297	0	3.528	0.178	0.001	3.379	0.3	–
Effort expectancy → App satisfaction	0.1	0.268	1.108	0.237	0	3.724	–	H1
Effort expectancy → Performance expectancy	0.597	0	6.431	0.444	0	4.121	0.17	–
Information quality → Performance expectancy	0.617	0	4.776	0.596	0	5.116	0.81	–
Information quality → Effort expectancy	0.820	0	11.005	0.571	0	5.187	0.09.	H2
Hedonism → App satisfaction	0.224	0.001	3.419	0.086	0.149	1.444	–	H3

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Regressions	SPAIN			UK			Differences test	Hypothesis
	Estim.	P	Z-value	Estim.	P	Z-value		
Aesthetics → Hedonism	0.927	0	16.282	0.915	0	16.327	0.67	–
eWOM → App satisfaction	0.180	0	4.209	0.256	0	5.711	0.46	–
Interaction → eWOM	0.971	0	12.700	0.644	0	9.595	0.000***	H4
Personalization → App satisfaction	0.021	0.665	0.447	0.235	0	6.032	–	H5
Relative advantage → App satisfaction	0.210	0.001	3.395	0.238	0	3.638	0.81	–
Privacy risk → App satisfaction	0.003	0.901	0.124	–0.066	0.087	–1.786	–	H6
App satisfaction → Continued-use intention	0.844	0	8.329	0.671	0	5.447	0.18	–

Signif. codes: 0 ‘*****’ 0.001 ‘****’ 0.01 ‘***’ 0.05 ‘**’ 0.1 ‘.’ 1.

Appendix 2. Comparison of relationships in original research model vs. model including control variables (age and gender)

Regressions	SPAIN				UK				Differences test	Differences test ^a	Hypothesis
	Estim.	P	Estim. ^a	P ^a	Estim.	P	Estim. ^a	P ^a			
Performance expectancy → App satisfaction	0.3	0	0.297	0	0.165	0.009	0.178	0.001	0.17	0.3	–
Effort expectancy → App satisfaction	0.092	0.359	0.1	0.268	0.244	0	0.237	0	–	–	H1
Effort expectancy → Performance expectancy	0.561	0	0.597	0	0.399	0	0.444	0	0.21	0.17	–
Information quality → Performance expectancy	0.668	0	0.617	0	0.635	0	0.596	0	0.85	0.81	–
Information quality → Effort expectancy	0.866	0	0.820	0	0.588	0	0.571	0	0.09.	0.093.	H2
Hedonism → App satisfaction	0.222	0.012	0.224	0.001	0.046	0.499	0.086	0.149	–	–	H3
Aesthetics → Hedonism	0.952	0	0.927	0	0.931	0	0.915	0	0.77	0.67	–
eWOM → App satisfaction	0.162	0.006	0.180	0	0.23	0	0.256	0	0.5	0.46	–
Interaction → eWOM	1.011	0	0.971	0	0.644	0	0.644	0	0.008**	0.000***	H4
Personalization → App satisfaction	0.056	0.7	0.021	0.665	0.27	0	0.235	0	–	–	H5
Relative advantage → App satisfaction	0.194	0.003	0.210	0.001	0.246	0	0.238	0	0.67	0.81	–
Privacy risk → App satisfaction	–0.005	0.813	0.003	0.901	–0.063	0.092	–0.066	0.087	–	–	H6
App satisfaction → Continued use intention	0.844	0	0.844	0	0.67	0	0.671	0	0.11	0.18	–

Signif. codes: 0 ‘*****’ 0.001 ‘****’ 0.01 ‘***’ 0.05 ‘**’ 0.1 ‘.’ 1.

a: Values when gender and age are included in the model.

Appendix 3. Questionnaire

- What is your nationality? British Spanish Other
- Country of residence: United Kingdom Spain Other
- Have you ever used travel Apps before? Yes No
- Have you undertaken any touristic trip in the last six months? Yes No
- What was the main destination of your last (tourism) trip? _____
- App Satisfaction**
- APPSAT1 I feel very satisfied with overall experience of using travel Apps
- APPSAT2 I am very pleased with the overall experience of using travel Apps.
- APPSAT3 I am very contented with the overall experience of using travel Apps.
- APPSAT4 I feel very delighted with the overall experience of using travel Apps
- Information Quality**
- INFOQUAL1 Travel Apps provide valuable information.
- INFOQUAL2 Travel Apps provide necessary information.
- INFOQUAL3 Travel Apps provide accurate information.
- INFOQUAL4 Travel Apps provide relevant information.
- Interaction**
- INTERACT1 Travel Apps help you to share information with other tourists.
- INTERACT 2 Travel Apps allow you to connect with other tourists
- INTERACT 3 Travel Apps support collaboration with other tourists
- INTERACT 4 Travel Apps help you to interact with other tourists.
- Effort expectancy**
- EE1 Learning how to use travel Apps is easy for me.
- EE2 My interaction with travel Apps is clear and understandable.
- EE3 I find travel Apps easy to use.
- EE4 It is easy for me to become skillful at using travel Apps.
- Performance expectancy**
- PE1 I find travel Apps useful in my tourism experience.
- PE2 Using travel Apps increases my chances of achieving things that are important to me.
- PE3 Using travel Apps helps me accomplish things more quickly.
- PE4 Using travel Apps increases my productivity.
- Aesthetics**

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AESTHET1	The interface of travel Apps is aesthetically appealing.
AESTHET2	The interface of travel Apps is attractive.
AESTHET3	The interface of travel Apps is aesthetically designed
AESTHET4	The overall look and feel of travel Apps is visually appealing.
AESTHET5	The interface of travel Apps pleases my senses.
e-WOM	
EWOM1	Many tourists say good things about travel Apps.
EWOM2	Tourists recommend travel Apps.
EWOM3	Tourists like travel Apps.
Hedonism	
HEDON1	Using travel Apps is fun.
HEDON2	Using travel Apps is enjoyable.
HEDON3	Using travel Apps is very entertaining.
Continued use Intention	
CUSEINT1	I intend to continue using travel Apps in the future.
CUSEINT2	I will always try to use Apps in my travels.
CUSEINT3	I plan to continue to use travel Apps frequently.
Personalization	
PERSONALIZ1	Travel Apps provide personalized information.
PERSONALIZ2	Travel Apps have the ability to understand my needs and preferences.
PERSONALIZ3	Travel Apps are interactive to me.
Privacy Risk	
PRIVRISK1	I do not feel totally safe providing personal private information to travel Apps.
PRIVRISK2	I am worried about using travel Apps because other people may be able to access my account.
PRIVRISK3	I do not feel secure sending sensitive information across travel Apps.
Relative advantage	
RELADV1	Travel Apps have more advantages than Internet or off-line traveller services because are not limited by location and time.
RELADV2	Travel Apps are more convenient than Internet or off-line traveller services.
RELADV3	Travel Apps are more efficient than Internet or off-line traveller services.

Gender:	Age:	Education:	Employment status:	Income level:	Travel companion(s):
<input type="checkbox"/> Male	<input type="checkbox"/> 18–24	<input type="checkbox"/> Higher or postgraduate degree	<input type="checkbox"/> Employed, working full-time	<input type="checkbox"/> Less than £999	<input type="checkbox"/> Alone
<input type="checkbox"/> Female	<input type="checkbox"/> 25–34	<input type="checkbox"/> First degree or foundation degree	<input type="checkbox"/> Employed, working part-time	<input type="checkbox"/> £1000–£1499	<input type="checkbox"/> With your partner
Marital Status:	<input type="checkbox"/> 35–44	<input type="checkbox"/> Other course below degree level and above secondary education	<input type="checkbox"/> Unemployed	<input type="checkbox"/> £1500–£2499	<input type="checkbox"/> With your children
<input type="checkbox"/> Single	<input type="checkbox"/> 45–54	<input type="checkbox"/> Secondary education	<input type="checkbox"/> Student	<input type="checkbox"/> £2500€–£3499	<input type="checkbox"/> With other family members
<input type="checkbox"/> Married	<input type="checkbox"/> 55–64	<input type="checkbox"/> Other formal study	<input type="checkbox"/> Retired	<input type="checkbox"/> £3500–£4999	<input type="checkbox"/> With friends
<input type="checkbox"/> Widowed	<input type="checkbox"/> 65–74	<input type="checkbox"/> Informal or no instruction	<input type="checkbox"/> Unable to work	<input type="checkbox"/> £5000 or more	<input type="checkbox"/> With work colleagues
<input type="checkbox"/> Separated	<input type="checkbox"/> 75 and over	<input type="checkbox"/> Other _____	<input type="checkbox"/> Looking after home/family		
<input type="checkbox"/> Divorced			<input type="checkbox"/> Other _____		

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