

The Influence of Innovativeness on On-Site Smartphone Use among American Travelers: Implications for Context-based Push Marketing

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Abstract

This study investigates the relationships between traveler innovativeness traits and the patterns of smartphone use during the experiential stage of tourism experience. Using data collected from 1126 travelers residing in the United States (US), it was identified that tourism innovativeness and technology innovativeness have significant positive effects on on-site use of smartphones for trip management, social networking, as well as searching deals, online consumer reviews, and push recommendations. In addition, technology innovativeness also positively influences smartphone use for navigation within destinations. The results suggest that highly innovative travelers are not only heavy users of smartphones for travel, they are also open to recommendations and influences when making on-site decisions. This makes the market segment an effective target for destinations and tourism businesses applying context-based marketing strategies to push recommendations for travelers on the move.

Keywords: consumer innovativeness, context-based marketing, push recommendation, smartphones, travel apps.

1. Background

Smartphones are adopted at a phenomenal pace (with 71% overall penetration rate in the US in 2014 according to Nielsen, 2014a) and, as a result, become an essential part of people's lives. Due to the persistent network connectivity and abundance of mobile apps, the use of smartphones causes changes in the ways in which people socialize, carry out tasks, find, gather and share information, have fun, and generally manage their lives (Oulasvirta, Rattenbury, Ma, & Raita, 2012; Nielsen, 2014b). These behavioral impacts are attributed to the core characteristics of portable computing: mobility, connectivity, and intelligent systems. Because of the ubiquitous and continuous access to information and social networks, smartphone users are increasingly able to communicate, collaborate, manage, and complete tasks while on the move that are traditionally carried out at home or at work. Additionally, as intelligent systems, smartphones are sensitive to contextual information such as time and user locations, enabling the technology to offer relevant real-time information for users to make immediate decisions on the spot. Therefore, smartphones are considered important in influencing travel behavior and travelers' use of smartphones remains a relevant research area that receives an increasing attention in the travel and tourism literature (Dickinson et al., 2014; Wang & Xiang, 2012; Wang, Xiang, & Fesenmaier, 2014a; 2014b).

In general, the roles of information and communication technology (ICT) in travel are associated with facilitation and enhancement of tourism experiences (Neuhofer, Buhalis & Ladkin, 2012; Tussyadiah & Fesenmaier, 2009; Wang, Park & Fesenmaier, 2012). Smartphones support travelers through convenience in travel planning and enhancement in the overall tourism experience by providing access to information and interpretation, direction and navigation, social networks, and entertainment (Wang, Park & Fesenmaier, 2012; Wang & Xiang, 2012). Most

importantly, the use of smartphones for travel has transformed the traditional way of understanding the chronological definition of tourism experiences, which categorizes them into anticipatory (pre-trip), experiential (en-route, on-site), and reflective (post-trip) stages. That is, travelers are increasingly able to make more on-site decisions with the assistance of a global positioning system (GPS) and mobile sensors (i.e., moving the planning tasks from anticipatory to experiential stage) and immediately share travel experiences (e.g., pictures, status updates) with the help of mobile social networking applications (apps) (i.e., moving the sharing tasks from reflective to experiential stage) (Wang, Park, & Fesenmaier, 2012; Wang, Xiang, & Fesenmaier, 2014b). Therefore, the use of smartphones by travelers emphasizes on-site experiences as the critical stage of tourism experience. As a consequence, there is an immense opportunity for tourism destinations and hospitality businesses to shape travelers' behavior by influencing their on-site decisions with relevant context-based push recommendations (Lamsfus, Wang, Alzua-Sorzabal, & Xiang, 2014; Tussyadiah, 2012).

From a marketing perspective, the introduction of geosocial services (i.e., apps that combine GPS and social networking platforms, such as Foursquare) to smartphones signifies the importance of marketing strategies that take advantage of contextual information and social networks. Tussyadiah (2012) suggests the term location-based social network (LSN) marketing to explain this approach; travel and social media practitioners refer to it as social, local, mobile (SoLoMo) or social, contextual, mobile (SoCoMo) marketing (e.g., Ankeny, 2013; Buhalis & Foerste, 2014; Lowy, 2013). Indeed, Zickuhr (2012) reveals that about 74% of smartphone owners in the US use geosocial services to obtain real-time location-based information, including directions, on their smartphones; 18% of them use the services to check-in. However, little is known about the use of these services in the travel context. In order to better understand the

prospects of contextual marketing in influencing travelers' on-site decisions, it is important to investigate the extent to which travelers use their smartphones to fulfill various needs while experiencing tourism destinations. Importantly, identifying the characteristics of the traveler segments who are open to contextual recommendations and social network influences while making on-site decisions will help tourism destinations and hospitality businesses to better target their marketing strategies.

Previous studies highlight the importance of targeting lead users for faster adoption and diffusion of new products, services, and technologies (e.g., Morrison, Roberts, & Midgley, 2004; Schreier, Oberhauser, & Prügl, 2007; Urban & von Hippel, 1988). Lead users are characterized by stronger innovativeness traits. They perceive technologies as less complex than “ordinary” customers do and, thus, are better prepared to adopt them (Schreier, Oberhauser, & Prügl, 2007). More recently, Couture, Arcand, Sénécal, and Oullet (2013) have suggested that consumer innovativeness in tourism explains tourists' online behaviors, including activities associated with information search, purchasing, and communication on tourism websites. Based on these studies, it can be suggested that the innovativeness traits of travelers will be reflected in their smartphone usage behaviors. That is, the more innovative the travelers are, the more they use smartphones for travel-related needs. Therefore, the main goal of this study is to assess the relationships between consumer innovativeness and on-site use of smartphones for travel. Specifically, this study applies domain-specific consumer innovativeness (Goldsmith & Hofacker, 2001) to tourism and technology domains and assesses its influence on the extent of on-site use of smartphones for information search, navigation, trip management, and social networking. The results from this study will inform tourism destinations and hospitality businesses in their

identification of the segment of travelers with a higher tendency to rely on smartphones for on-site decision making.

2. On-Site Use of Smartphones

Previous literature on mobile technology and tourism is dominated by studies that introduce various mobile applications for travelers, such as mobile tour guides, and test the usability of these applications for their users (see for example Abowd et al., 1997; Cheverst et al., 2000; Kramer, Modsching, Schulze, & ten Hagen, 2005; Kramer, Modsching, ten Hagen & Gretzel, 2007). However, since the birth of smartphones, which gave rise to the pervasive development in travel-related apps, most recent studies have started to focus more on the different types of use of smartphones for travel and their impacts on the different aspects of tourism experience (see for example Dickinson et al., 2014; Wang, Park, & Fesenmaier, 2012; Wang & Xiang, 2012; Wang, Xiang, & Fesenmaier, 2014a; 2014b). In general, these studies can be categorized into two groups: (1) studies based on an analysis of travel-related apps (i.e., what smartphones could be used for; the potential use) and (2) studies based on an analysis of traveler behavior (i.e., what travelers really use; the actual use).

Within the first group, Wang, Park and Fesenmaier (2012) as well as Wang and Xiang (2012) analyze travel-related apps that are available in Apple's App Store, classify them based on their functionalities, and suggest various usage of smartphones for travelers before, during and after a trip. According to these studies, smartphones can be used on-site for navigation and itinerary management (i.e., using tour guide apps), information search (e.g., using food finders or apps that offers travel tips), entertainment (i.e., for passing the time), and facilitation of travel (e.g., translation, currency converter, weather reporting, etc.). More recently, Dickinson et al. (2014) have suggested on-site smartphone types of usage based on a content analysis of visitor

attraction apps in the United Kingdom (UK). They suggest such on-site use as for information search (i.e., for description of attractions), sharing, itinerary management, and tagging (e.g., tagging locations with user stories).

While analyzing the available travel-related apps can be useful to understand the potential use and impacts on travel behavior, understanding how travelers use their smartphones while traveling (i.e., actual use) provides a better foundation on which to assess the roles of smartphones in travel. The second category of literature explored the actual use of smartphones for travel-related activities based on observation, interviews and online surveys targeting travelers. Using the first generation internet phone (Nokia's N95) equipped with GPS, camera, and applications with access to social networking sites, Tussyadiah, Fesenmaier, and Yoo (2008) conducted an experience-based survey and ethnographic study to observe tourists behavior as they experienced the city of Philadelphia, US. The findings from this study suggest several on-site types of use, which include information search (i.e., using mobile internet to search for user reviews and location-based information), navigation (i.e., using GPS tracker), and sharing (i.e., posting pictures and stories). Other studies by Verkasalo, Lopez-Nicolas, Molina-Castillo, and Bouwman (2010) on the use of smartphones in everyday life and Modschein (2011) on the use of smartphones for *passeggiata* (i.e., a stroll through town) activities suggest the types of use that are relevant to tourism, including navigation and information search (i.e., the use of mobile internet and mapping services) as well as itinerary management (i.e., scheduling and coordination).

More recently, based on in-depth interviews with smartphone users, the phenomenological studies by Wang, Xiang, and Fesenmaier (2011; 2014a; 2014b) reveal how travelers use smartphones while traveling in relation to their usage habits in their daily lives.

Based on their categorization, on-site smartphone usage types can be summarized into communication, entertainment, facilitation, and information search. In their studies, the use of smartphones for entertainment is associated with filling the down time and, thus, is not critical to decision making. In summary, the usage types relevant to on-site decision making as suggested in previous studies are navigation, trip management, information search, and communication (i.e., sharing). Wang, Xiang, and Fesenmaier (2014b) suggest two broad categories that encapsulate these usage types: (1) en-route planning (accommodating a shift from the planning stage), including navigation, information search, and itinerary/trip management, and (2) en-route sharing (accommodating a shift from the reflective stage), including taking and posting pictures on social networking sites. Therefore, this study explores the extent of on-site smartphone use for navigation, trip management, information search, and social networking. Furthermore, in order to provide a meaningful contribution to the area of context-based mobile marketing (i.e., SoLoMo and SoCoMo marketing approaches), the use for information search is expanded to capture different types of information and sources relevant to geosocial services, including the use of smartphones to search for online consumer reviews (Tussyadiah, Fesenmaier, & Yoo, 2008), deals and discounts (Wang, Xiang, & Fesenmaier, 2014b), and context-based push recommendations (Tussyadiah, 2012) to make on-site decisions (such as what to do, where to eat and shop, etc.).

3. Consumer Innovativeness

Consumer innovativeness, defined as the propensity of consumers to adopt novel ideas, goods, services, technologies, and so on (Hirschman, 1980), is immediately relevant to consumer behavior as it is associated with the diffusion of new products and services (Goldsmith, Freiden, & Eastman, 1995; Roger & Shoemaker, 1971). That is, more innovative consumers typically

expect high benefits from innovation and adopt new products and services more extensively and quickly than others (Morrison, Roberts, & Midgley, 2004; Urban & von Hippel, 1988; von Hippel, 1986). Consumer innovators provide feedback and revenues to companies offering new products and services, making them a valuable market segment (Hjalager & Nordin, 2011). Additionally, studies in marketing suggest that consumer innovativeness leads to preference, decision making, and brand loyalty (see for example Flynn & Goldsmith, 1993; Im, Bayus, & Mason, 2003). Therefore, Midgley (1977) argues that focusing on consumer innovators is the key to successful introduction of new products and services.

Generally, there are two streams of research on consumer innovativeness: one focusing on innate innovativeness (i.e., predisposition as an underlying psychological factor) (see for example Hirschman, 1980; Midgley & Dowling, 1978) and the other focusing on actualized innovativeness (i.e., actual acquisition of products, services, technologies, etc.) (see for example Midgley & Dowling, 1993; Rogers, 2003; Rogers & Shoemaker, 1971). The first stream of research defines innate innovativeness as a generalized unobservable predisposition toward innovations that is applicable across different product categories (Im, Bayus, & Mason, 2003). In other words, innate innovativeness is a generalized personality trait, which reflects an individual's receptiveness to new experiences and novelty. Furthermore, in line with Gatignon and Robertson (1985) who argue that innovativeness does not overlap across domains, Goldsmith and Hofacker (1991) differentiate between global (general) innovativeness and domain-specific innovativeness (DSI) based on the abstraction level of the traits. DSI reflects consumers' tendency to adopt new products within a specific domain of interest (e.g., a product category). The second stream of research uses indirect measures of actualized innovativeness (i.e., adoption or purchase behavior) such as purchase intentions (see for example Citrin, Sprott,

Silverman, & Stem, 2000; Goldsmith, 2002; Holak & Lehmann, 1990; San-Martín & Herrero, 2012), frequency of purchase (e.g., Goldsmith, 2000; 2001; Goldsmith & Lafferty, 2001), and relative time of adoption (Rogers & Shoemaker, 1971). Similarly, on-site smartphone usage behaviors by travelers can also be considered as indicators of actualized innovativeness (i.e., technology adoption behaviors). Finally, as summarized in Table 1, a notable amount of research is devoted to explain the influence of innate innovativeness (i.e., traits; abstract) on actualized innovativeness (i.e., adoption behavior; concrete), confirming that the former is a significant predictor of the latter.

Generally, previous studies support the hypothesis that the innovativeness trait is a factor of adoption behavior. Midgley and Dowling (1978) conceptualize a contingency model of innovativeness in which innate innovativeness interacts with personal characteristics and social communication networks to influence adoption behavior. Furthermore, past empirical studies provide support for positive associations between innovativeness traits and innovative behavior. Consumer innovativeness is positively associated with adoption of new products (Goldsmith, Freiden, & Eastman., 1995; Im, Bayus, & Mason, 2003) and online shopping behavior (Citrin et al., 2000; Limayem, Khalifa, & Frini, 2000), which includes time, frequency, and amount of spending associated with online shopping (Goldsmith & Flynn, 1992; Goldsmith, Flynn, & Goldsmith, 2003). In the domain of tourism, consumer innovativeness is linked to adoption behavior in terms of purchase intention for travel products (San-Martín & Herrero, 2012), adoption of travel agencies (Goldsmith, Flynn, & Bonn, 1994), online information search behavior (Couture et al., 2014), and attitude towards location-based marketing involving mobile phones (Beldona, Lin, & Yoo, 2012). Based on empirical evidence provided in these studies, it is

reasonable to assume that travelers' innovativeness (i.e., innate innovativeness) has a positive impact on their smartphone usage behavior (i.e., actualized innovativeness).

Past research confirms that DSI is more predictive of a particular behavior than the general innovativeness traits (Agarwal & Prasad, 1998; Goldsmith, Freiden, & Eastman, 1995). Therefore, DSI should be applied to travel and tourism domain in order to predict travel-related behavior. Flynn and Goldsmith (1993) apply the DSI scale to identify innovative travel consumers and predict innovative travel behavior. They show that adults who score higher in their DSI in travel take more vacations and make a greater use of travel agents. Similarly, Goldsmith and Litvin (1998) suggest that DSI in the domain of travel is positively correlated with travel involvement, product knowledge, opinion leadership, information seeking, travel frequency, and total annual trips taken. More recently, Couture et al. (2013) identify that innovativeness in the domain of tourism positively influences online behavior, which includes number of visits to travel websites, average time between visits, online travel purchase, as well as tendency to download information brochures, to use chat functions, and to write email comments when using travel websites. Therefore, it can be suggested that consumer innovativeness in the domain of tourism is a determinant of on-site smartphone use for travel-related purposes. The following hypotheses are suggested:

Hypothesis 1: Perceived tourism innovativeness has a positive effect on on-site smartphone use among travelers, including smartphone use for trip management (*H1a*), navigation (*H1b*), push recommendations (*H1c*), information search via online consumer reviews (*H1d*), information search on deals and discounts (*H1e*), and social networking (*H1f*).

As suggested by Goldsmith and Goldsmith (1996), consumer innovativeness tend to manifest itself within specific categories with little overlap with other categories. In addition to the domain of tourism, on-site smartphone use behaviors are also associated with the domain of information technology. Therefore, it is important to take into account consumer innovativeness in both domains (i.e., tourism and information technology) when analyzing smartphone usage behavior while traveling. Perceived innovativeness in the domain of information technology is defined as an individual's willingness to try out, or experiment with, new information technology (Agarwal & Prasad, 1998). Empirical evidence from e-commerce research indicates the predominance of this variable as a predictor of online behaviors (Citrin et al., 2000; Goldsmith & Lafferty, 2001; Limayem, Khalifa, & Frini, 2000). In the context of rural tourism, San-Martín and Herrero (2012) assess the influence of DSI in information technology on online purchase intention for rural accommodations (i.e., intention to make a reservation). Their findings indicate that perceived innovativeness in information technology plays a fundamental role as a direct predictor of online purchase intention and as a moderator variable for other psycho-cognitive effects. Based on the evidence from past research, it can be suggested that consumer innovativeness in the domain of information technology is a determinant of on-site smartphone usage behaviors. The following hypotheses are suggested:

Hypothesis 2: Perceived technology innovativeness has a positive effect on on-site smartphone use among travelers, including smartphone use for trip management (*H2a*), navigation (*H2b*), push recommendations (*H2c*), information search via online consumer reviews (*H2d*), information search on deals and discounts (*H2e*), and social networking (*H2f*).

Characterized as consumer traits, personal innovativeness has been assessed in relation to various demographic characteristics in previous studies, even though the results were inconsistent. For example, Steenkamp, Hofstede, and Wedel (1999) found a significant relationship between age and innovativeness, while it was found insignificant in Im, Bayus, and Mason's (2003) study. Similarly, significant relationships were found between innovativeness and income (Steenkamp & Burgess, 2002), education (Venkatraman & Price, 1990), and gender (Steenkamp & Burgess, 2002). However, these relationships remain insignificant in other studies: education (Im, Bayus, & Mason, 2003; Steenkamp & Burgess, 2002; Steenkamp, Hofstede, & Wedel, 1999), income (Im, Bayus, & Mason, 2003; Steenkamp & Burgess, 2002; Steenkamp, Hofstede, & Wedel, 1999), and gender (Venkatraman & Price, 1990). Similarly, demographics have been associated with smartphone use. For example, Deloitte (2014) revealed that as smartphone owners are dominated by younger demographics, younger users dominate the use of smartphones for social networking (i.e., 75% of 18 – 24 year old users use social networking weekly, compared to 28% of users 65 years and older). Rahmati et al. (2012) identified differences in patterns of iPhone usage among users with different socioeconomic status (SES), with those from lower SES spending more money on and installing more apps. However, based on their research on smartphone activities, Falaki et al. (2010) conclude that user demographics cannot reliably predict how a user will use his or her smartphones. Due to the inconsistent results tying demographic characteristics to innovativeness traits and smartphone usage behavior, while this study does not hypothesize demographic variables as predictors of on-site smartphone use for travel, it is important to include them as control variables in the analysis. Additionally, as travel frequency was associated with innovativeness in the context of tourism (Flynn & Goldsmith, 1993; Goldsmith & Litvin, 1998), it is also important to control for travel

frequency in the hypothesis testing. Controlling for demographic variables and travel frequency will allow for an identification of the “independent” effects of innovativeness traits on smartphone use behavior.

4. Methodology

In order to achieve the goals of this study, an online survey was administered to capture responses from adult travelers residing in the US. A questionnaire was designed to explore traveler innovativeness in the domains of tourism (i.e., Perceived Tourism Innovativeness, InTour) and technology (i.e., Perceived Technology Innovativeness, InTech) and the patterns of smartphone use for six different activities during traveling. A DSI scale (Goldsmith & Hofacker, 1991) was adapted to two domains, namely tourism and technology, using five measurement items (please see Appendix). Responses to these items were presented as a 5-point Likert-type scale from 1–Strongly Disagree to 5–Strongly Agree. To capture the patterns of on-site smartphone use, questions on the frequency of smartphone use for trip organization, navigation, searching for online consumer reviews, deals, and contextual recommendations as well as social networking activities during traveling were included (see Appendix). Responses to these questions were presented on a 5-point Likert-type scale from 1–Never to 5–All the time. Additionally, questions regarding respondents’ demographic characteristics and travel frequency were also included in the questionnaire.

The questionnaire was distributed through Amazon Mechanical Turk (mturk.com), a crowdsourcing marketplace facilitating the coordination of task completion that requires human intelligence, as part of a larger study on travel behavior. The questionnaire was presented in a task (i.e., called ‘human intelligence task’ or HIT) and distributed to adult users who reside in the US (i.e., by geographic targeting, making the HIT only accessible to users with a US address) on

August 24, 2014 and September 22, 2014. In order to make sure that respondents had recent travel experiences, a screening question was included to allow only those who had taken at least one trip for tourism and leisure purposes in the past six months to answer the questionnaire. Depending on the overall length of the task, all respondents received US\$.40 – US\$.80 (between forty to eighty cents) upon completion of the questionnaire, which is equivalent to an effective hourly compensation of US\$4.65 (four dollars and sixty five cents) on average. These efforts resulted in 1126 usable responses.

Because the DSI scale has been verified in various contexts before, the two DSI scales as applied to tourism and technology domains in this study were tested using confirmatory factor analysis (CFA), a multivariate statistical technique used to verify the factor structure of a set of observed variables. In order to determine the goodness of fit, several measures were calculated and compared against model fit criteria. These measures include loadings of all factors, chi-square value, Comparative Fit Index (CFI) (i.e., $CFI > .90$, Hair, Black, Babin, & Anderson, 2010), Tucker-Lewis Index (TLI) (i.e., $TLI > .90$, Hair et al., 2010), Root Mean Square Error of Approximation (RMSEA) (i.e., cut-off value of .05 for a good fit and .08 for a moderate fit, MacCallum, Browne, & Sugawara, 1996), and Standardized Root Mean Square Residual (SRMR) (i.e., $SRMR < .08$; Hu & Bentler, 1999). In order to confirm reliability, Composite Reliability (CR) was calculated (i.e., $CR > .70$; Chin, 1998). To test for convergent validity and discriminant validity, Average Variance Extracted (AVE) was calculated (i.e., $AVE > .50$; Dillon & Goldstein, 1984; Fornell & Larcker, 1981) and compared against the inter-construct correlation (i.e., square root of AVE greater than inter-construct correlation; Hair et al., 2010). The CFA was run using Mplus software (Muthén & Muthén, 2012).

Furthermore, to test the proposed hypotheses and to explain the relationships between tourism and technology innovativeness on the six on-site smartphone uses among travelers, several hierarchical regression analyses were conducted. Hierarchical regression attempts to improve the standard regression estimates by adding terms to regression models in stages. Given that demographic variables and travel frequency have been found to be associated with innovativeness and smartphone use (Falaki et al., 2010; Flynn & Goldsmith, 1993; Goldsmith & Litvin, 1998; Rahmati et al., 2012; Steenkamp & Burgess, 2002; Steenkamp, Hofstede, & Wedel, 1999; Venkatraman & Price, 1990), variables of gender, age, education, income, and travel frequency were included as control variables in the regression analysis to assess the potential causal relationship with smartphone usage behavior. These control variables were entered first in Step 1. In Step 2, the DSI scale representing personal innovativeness in the domains of tourism (InTour) and technology (InTech) were included. This way, the effects of InTech and InTour tested in the regression models are independent of the effects of the first set of variables (i.e., demographic and travel frequency), which are already controlled for. At each stage, the change in R^2 was calculated as additional terms were included to determine if the change in R^2 is significantly different from 0. The regression analyses were run using IBM SPSS Statistics 19 software.

5. Results and Discussion

The respondents in this study are predominantly males (60.4%) and 53.3% of them are between 25 and 35 years of age. The majority of respondents (40.1%) have a four-year college degree (i.e., undergraduate level) and a little less than 40% have some experience with higher education (9.1% have a two-year college degree and 28.5% have some college education). In terms of income, the majority of respondents have an annual income of less than US\$60,000, with 15.4%

in the range of US\$30,000 – US\$39,999 and 14.2% in the range of US\$40,000 – US\$49,999. The majority of respondents (45%) indicate that they travel two to three times a year for tourism and leisure purposes; 27% of them travel about once a year and 18.6% travel more than three times a year (Table 1).

== Table 1 about here ==

5.1 Perceived Tourism and Technology Innovativeness

A CFA was conducted to verify the DSI scales as applied to the tourism (InTour) and technology (InTech) domains. First, several fit indices were consulted: χ^2 (df) = 390.49 (34), CFI = .96, TLI = .95, RMSEA = .08 and SRMR = .03. These indices meet the criteria for a good model fit (Hair et al., 2010; Hu & Bentler, 1999), with the exception of RMSEA, which is still in the range of value that indicates acceptable, moderate fit (Hair et al., 2010). Next, the values for CR and AVE were calculated to confirm the validity and reliability of the factors. The factor loadings of all but one item in InTour are above .70 (InTour1 = .84; InTour3 = .80; InTour4 = .90; InTour5 = .88) with *t*-statistic significant at $p < .01$. Item InTour2 has a factor loading of .58 ($p < .01$), which is within the common cut-off criteria of .40 (Salkind, 2010). The average variance extracted of the scale is above the cut-off point of .50 ($AVE = .65$), indicating convergent validity (Dillon & Goldstein, 1984; Fornell & Larcker, 1981). The composite reliability score is above .70 ($CR = .90$), indicating reliability of the scale (Chin, 1998; Hair et al., 2010). The factor loadings of all items in InTech are above .7 (InTech1 = .89; InTech2 = .74; InTech3 = .85; InTech4 = .91; InTech5 = .85) with *t*-statistic significant at $p < .01$. The average variance extracted of InTech is above the cut-off point of .50 ($AVE = .72$), indicating convergent validity of the scale (Dillon & Goldstein, 1984; Fornell & Larcker, 1981). The composite reliability score is also above .70 ($CR = .93$), indicating reliability of the scale (Chin, 1998). Finally, the square root of AVEs (InTour:

Sqrt AVE = .81; InTech Sqrt: AVE =.85) are greater than their inter-construct correlation ($r = .42$), confirming convergent validity (Hair et al., 2010). Therefore, it can be suggested that the measurement items of the DSI scale represent the two constructs well.

The overall mean score for tourism innovativeness scale is rather moderate ($Mean = 3.20$, $s.d. = .86$), while the average score for perceived technology innovativeness is slightly higher ($Mean = 3.61$, $s.d. = .88$). In order to assess the need for control variables in the regression models, independent samples t -tests were conducted for InTour and InTech to capture differences in terms of demographic characteristics and travel frequency (see Table 2). Statistically significant differences were found in terms of income (i.e., respondents with higher annual income rated themselves higher in terms of tourism innovativeness) and travel frequency (i.e., respondents who travel more frequently rated themselves higher in terms of tourism innovativeness), confirming the findings from previous research (Flynn & Goldsmith, 1993; Goldsmith, Flynn, & Bonn, 1994; Goldsmith & Litvin, 1998). No significant differences were found in terms of gender, age, and level of education. In terms of technology innovativeness, statistically significant differences were found in terms of gender (i.e., male respondents rated themselves higher in terms of technology innovativeness than female respondents), income (i.e., respondents with a higher annual income rated themselves higher in terms of technology innovativeness than respondents with a lower annual income), and education (i.e., respondents with lower level of education rated themselves higher in terms of technology innovativeness than respondents with a higher level of education). No significant differences were found in terms of age and travel frequency. These suggest that further analyses should control for demographic variables and travel frequency to isolate the true relationships as hypothesized in this study.

== Table 2 about here ==

5.2 On-Site Smartphone Usage Behaviors

Respondents indicated different frequency levels for different on-site smartphone usage types during traveling. They use their smartphones most often for Navigation (*Mean* = 4.24, *s.d.* = .85), followed by searching for Online Reviews (*Mean* = 3.83, *s.d.* = .95), Searching for Deals and discounts (*Mean* = 3.35, *s.d.* = 1.17), and relying on their smartphones for Push Recommendations (*Mean* = 3.31, *s.d.* = 1.15). It is noteworthy that these usage types are highly associated with on-site decisions, signifying the opportunities for destinations to influence their behavior on-site. Respondents use their smartphones less frequently for Social Networking (*Mean* = 3.09, *s.d.* = 1.27) and Trip Management (*Mean* = 2.90, *s.d.* = 1.18). Considering trip management can be highly associated with planning (i.e., organization of decisions made in advance, typically pre-trip), the fact that not many travelers use their smartphones for trip organization may indicate that some decisions were made instantaneously (i.e., on-site) as indicated in the four usage types.

Independent samples *t*-tests were conducted for these six usage types to capture differences in terms of demographic characteristics and travel frequency (see Table 3). In terms of gender, a statistically significant difference was found in smartphone use for online reviews, with female respondents indicating a higher extent of use. Similarly, a significant difference in terms of age was found in only one usage type, namely push recommendations, with older travelers indicating a higher extent of use. Differences in terms of level of education were found in smartphone use for navigation, recommendation, and online reviews, all indicating that travelers with a higher level of education (i.e., having four-year college degrees or higher) reporting higher extent of smartphone use for these purposes. In terms of income, significant differences were found in usage types for trip management, recommendation, online reviews,

and search for deals, with travelers in higher income brackets (i.e., US\$60,000 or more) reporting a higher extent of on-site smartphone use for these purposes. Finally, travelers with different travel frequencies also significant differ in their smartphone use for search for trip management, recommendation, online review, and search for deals, with those who travel more often (i.e., twice per year or more) indicating higher usage types. The only smartphone use type without with no identification of differences among groups with different demographic variables and travel frequency was social network. As a result, it is necessary to consider these control variables in the hypothesis testing.

5.3 Hypothesis Testing

Hierarchical multiple regression analyses were conducted to test the two hypotheses in this study controlling for demographic variables and travel frequency. Since the ability of an independent variable to predict the dependent variable is based on the correlation between them, it is important to consider the inter-correlation between independent variables in multiple regressions. The correlation matrix between control variables, independent variables, and dependent variables is presented in Table 4. A significant positive inter-correlation is observed between the independent variables, perceived tourism innovativeness and perceived technology innovativeness, ($r = .42, p < .05$). Inter-correlations between independent and control variables are significant between perceived tourism innovativeness and Age ($r = -.07, p < .05$), Income ($r = .10, p < .05$) and Travel Frequency ($r = .23, p < .05$), as well as between perceived technology innovativeness and Gender ($r = -.20, p < .05$), Education ($r = -.08, p < .05$), Income ($r = .07, p < .05$), and Travel Frequency ($r = .06, p < .05$). Among the control variables, significant correlations were found between Age and Gender ($r = .10, p < .05$), Education ($r = .08, p < .05$), and Income ($r = .08, p < .05$), all of which are relatively low, while Education is significantly

correlated with Income ($r = .28, p < .05$). Finally, Travel Frequency is significantly correlated, despite being very low, with Education ($r = .08, p < .05$) and Income ($r = .08, p < .05$). Due to the significant inter-correlations between variables, the collinearity statistics of all regression models were consulted to diagnose for multicollinearity. The values of tolerance are all above .70 (VIF below 10), indicating a high percentage of variance in the predictors that cannot be accounted for by the other predictors. Therefore, there is no indication of multicollinearity in the regression models.

== Table 4 about here ==

The results of the hierarchical multiple regression analyses are presented in Table 5. To explain the hypothesized relationships between perceived innovativeness and smartphone use, particular attention should be given to the estimates in the final models (Step 2). First, the change in R^2 as the independent variables were added to the regression model represents their effects independently from the control variables. The results show that the R^2 change in all regression models is positive and significant: the variance in the independent variables explains 18% of variance in Trip Management, 5% of variance in Navigation, 19% of variance in Push Recommendations, 6% of variance in Online Reviews, 17% of variance in Searching for Deals and 18% of variance in Social Networking, after controlling for demographic and travel frequency variables.

== Table 5 about here ==

Among the control variables, several demographic variables remain significant in the final regression models. Trip Management is significantly influenced by Gender ($\beta = .07, p < .05$), Age ($\beta = -.09, p < .001$), Education ($\beta = .06, p < .01$) and Income ($\beta = .07, p < .001$). Navigation is significantly influenced by Education ($\beta = .13, p < .001$). Push Recommendations

is significantly influenced by Gender ($\beta = .07, p < .05$), Age ($\beta = -.10, p < .001$), Education ($\beta = .08, p < .01$) and Income ($\beta = .07, p < .05$). Online Reviews is significantly influenced by Gender ($\beta = .17, p < .001$), Education ($\beta = .06, p < .01$) and Income ($\beta = .07, p < .05$). Searching for Deals is significantly influenced by Gender ($\beta = .11, p < .001$) and Age ($\beta = -.07, p < .01$). Finally, Social Networking is significantly influenced by Income ($\beta = -.07, p < .05$). That is to say, higher smartphone use is associated with travelers who are younger, female, highly educated, and have a higher income, with the exception of social networking. However, these results demonstrate that the demographic characteristics predict travelers' smartphone usage behavior to a lower degree. Hence, they may not be useful for segmentation and targeting in contextual push marketing strategies. Travel frequency was not found to be significant in predicting any smartphone use on-site. Therefore, it can be concluded that, despite very low, demographic characteristics of travelers predict their smartphone behavior while experiencing tourism destinations.

H1: Statistically significant positive effects of perceived tourism innovativeness were identified on on-site smartphone use for Trip Management ($\beta = .27, p < .001$), Push Recommendations ($\beta = .26, p < .001$), Online Reviews ($\beta = .15, p < .001$), Searching for Deals ($\beta = .21, p < .001$), and Social Networking ($\beta = .25, p < .001$). These results indicate that the more innovative travelers are in the domain of tourism, the more involved they are in on-site travel decision-making as reflected in activities such as finding contextual real-time information (e.g., through push recommendations, on-site deals and discounts, online consumer reviews). This is consistent with findings from previous research that innovative travelers tend to be more involved and make a greater use of resources to manage their trips (Couture et al., 2013; Flynn & Goldsmith, 1993; Goldsmith, Flynn, & Bonn, 1994; Goldsmith & Litvin, 1998). However, no

significant effect was found on the use of smartphones for navigation. Based on previous research, this result may suggest that innovative travelers are likely to be more knowledgeable and informed about tourism destinations and attractions (Goldsmith, Flynn, & Bonn, 1994; Goldsmith & Litvin, 1998). Hence, they do not need to use their smartphones for direction and navigation in tourism destinations. Based on these results, *H1a*, *H1c*, *H1d*, *H1e*, and *H1f* are supported.

H2: Statistically significant positive effects of perceived technology innovativeness were identified on all on-site smartphone usage types: Trip Management ($\beta = .25, p < .001$), Navigation ($\beta = .25, p < .001$), Push Recommendations ($\beta = .22, p < .001$), Online Reviews ($\beta = .15, p < .001$), Searching for Deals ($\beta = .30, p < .001$), and Social Networking ($\beta = .15, p < .001$). These results indicate that the more innovative travelers are in the domain of information technology, the more they use their smartphones for different purposes during traveling. This confirms that consumers who are more open to try out new technologies or high-tech products would feel more comfortable using technology devices and applications for different purposes, leading them to become expensive users of information technology. This is consistent with previous research suggesting that lead users perceive technology as less complex and, thus, are better prepared to adopt new technologies compared with mainstream consumers (see for example San-Martín & Herrero, 2012; Schreier, Oberhauser, & Prügl, 2007). Therefore, *H2a*, *H2b*, *H2c*, *H2d*, *H2e*, and *H2f* are supported.

The results confirm the significance of consumer innovativeness as a predictor of smartphone usage behaviors. That is, consumer innovators use their smartphones to search for references while experiencing a tourism destination, as indicated by the significant effects of both tourism and technology innovativeness (i.e., as demonstrated by their estimates) on the use

of smartphones to search for deals and discounts, push recommendations, and social networking. These show that consumer innovators are prone to influences from others to make decisions on-site, making them an effective target for push recommendations or proactive contextual advertising.

6. Conclusion and Implications

With the prevalence of smartphone use worldwide and the transformation it causes of consumer behavior (Oulasvirta et al., 2012), it is important to investigate the use smartphones during traveling to assess the behavioral patterns of travelers (Wang, Xiang, & Fesenmaier, 2014a; 2014b). Importantly, understanding the factors that foster the adoption of smartphones for different travel-related uses in a tourism destination is central to developing strategies for tourism marketing (Couture et al., 2013). This study focuses on identifying consumers' characteristics that drive the use of smartphones during traveling. Specifically, this study investigates consumer innovativeness in the domains of tourism and information technology as a significant predictor of on-site smartphone usage behaviors. Using responses collected from 1126 travelers residing in the US, hierarchical regression analyses were utilized to test the influences of tourism innovativeness and technology innovativeness on six different usage types of smartphones at the experiential stage of tourism experience: trip management, navigation, push recommendations, online reviews, searching for deals and discounts, and social networking. The six usage types were included in the study based on the suggested usage types from previous literature regarding smartphone use for travel-related purposes (see for example Dickinson et al., 2014; Tussyadiah, Fesenmaier, & Yoo, 2008; Verkasalo et al., 2010; Wang, Xiang, & Fesenmaier, 2014a; 2014b).

In order to estimate traveler innovativeness, a DSI scale (Agarwal & Prasad, 1998; Goldsmith & Hofacker, 1991) was adapted to the domains of tourism and technology. The results from a CFA confirm the validity and reliability of the measurement items to represent these two factors. Hence, it can be suggested that there is a group of travelers who are more innovative than others in the tourism domain (i.e. ahead of others in terms of travel-related behavior and experience) and 1045 in the technology domain (i.e. the first among their circle of friends to try out new technology). Previous studies have applied a DSI scale into tourism and information technology and tested it as a predictor of online purchase behavior (Couture et al., 2013; Goldsmith & Litvin, 1998; San-Martín & Herrero, 2012). This study provides empirical support for the consistency of consumer innovativeness scale in predicting travelers' usage behavior of smartphones in the context of on-site experiences. Therefore, this study contributes theoretically to the stream of research on travelers' innovativeness traits and to the body of research on the use of smart mobile technologies in travel.

The hierarchical regression models included several demographic variables and travel frequency as control variables. Among the four demographic characteristics, gender was the most consistent in predicting travelers' use of smartphones with positive effects identified on five use types (i.e., except for navigation). The effects of other demographic characteristics were observed on three or four use types. However, the beta coefficients of the demographic variables are relatively small in comparison with consumer innovativeness scale, except for the effects of gender on smartphone use for online reviews (i.e., female travelers are highly associated with using their smartphones to check for online reviews). From these results, it can be suggested that consumer innovativeness is a better predictor of smartphone use behavior than demographic characteristics.

Since previous studies linked consumer innovativeness and smartphone use to demographic variables and travel frequency, the relationships between traveler innovativeness and on-site smartphone use were estimated using hierarchical regression analyses incorporating traveler demographics and travel frequency as control variables. While several control variables remain significant in the final regression models, the estimates are extremely low to be of importance in comparison with the independent variables. Traveler innovativeness in the domains of tourism and information technology consistently predicts the different usage types of smartphones in tourism destinations. Specifically, perceived technology innovativeness has a significant positive impact on all usage types (H2 was supported), while tourism innovativeness has a significant positive impact on five of the six usage types. That is to say, the impact of tourism innovativeness on smartphone use for navigation was not identified in this study (H1 was partially supported). Thus, this study emphasizes the importance of identifying consumer innovators or lead users for the development and diffusion of new products and services (Urban & von Hippel, 1988; von Hippel, 1986) in the contexts of travel and tourism (Hjalager & Nordin, 2011).

Most importantly, understanding consumer innovativeness traits has an important implication for targeting purposes in tourism marketing (Couture et al., 2013). Previous studies suggest new marketing opportunities enabled by the use of smart mobile systems, specifically those associated with context-based marketing approaches (Buhalis & Foerste, 2014; Lamsfus et al., 2014; Tussyadiah, 2012). For tourism destinations and businesses developing mobile marketing strategies utilizing intelligence and proactivity of the smartphone systems, it is confirmed that consumers who are among the first to adopt new travel applications are more susceptible to push recommendations than the laggards. From the tourism innovativeness

perspective, it also means that a group of travelers with a tendency to explore new destinations (i.e. explorers, novelty seekers) and an experience visiting more destinations as compared with the average travelers is more susceptible to contextual marketing. Therefore, in order to reach consumer innovators, it is important for tourism destinations and businesses to develop and communicate the newness of products and services as well as technology applications to appeal to lead users.

This study has some limitations with regard to research scope and methodology, which should be addressed in future research. Firstly, this study focuses only on consumer characteristics as the drivers of smartphone use, future studies should capture situational contexts, such as trip purposes or the characteristics of the travel party, which may influence the use of smartphones during traveling in addition to traveller-related factors. Furthermore, different methods of data collection and analysis, such as observation of actual use based on smartphone log files, can also be employed in future research to reduce the possible bias associated with capturing travelers' behavior through self-reporting techniques in the survey method.

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Appendix

Measurement Items for Perceived Tourism Innovativeness (Goldsmith & Hofacker, 1991; San-Martín & Herrero, 2012)

InTour1 – *“In general, I am among the first in my circle of friends to visit a new tourism destination.”*

InTour2 – *“If I heard that a new tourism destination was opened, I would be interested enough to visit it.”*

InTour3 – *“Compared to my friends, I visit a lot of tourism destinations.”*

InTour4 – *“In general, I am the first in my circle of friends to know the latest trends in travel and tourism.”*

InTour5 – *“I know about new tourism destinations before other people do.”*

Measurement Items for Perceived Technology Innovativeness (Goldsmith & Hofacker, 1991; Agarwal & Prasad, 1998)

InTech1 – *“In general, I am among the first in my circle of friends to try out a new technology.”*

InTech2 – *“If I heard about a new technology, I would find ways to experiment with it.”*

InTech3 – *“Compared to my friends, I use a lot of new technology.”*

InTech4 – *“In general, I am the first in my circle of friends to know the latest trends in technology.”*

InTech5 – *“I know about new technologies before other people do.”*

Statements corresponding to On-Site Smartphone Use Types (Tussyadiah, Fesenmaier, & Yoo, 2008; Wang, Xiang, & Fesenmaier, 2014a; 2014b)

Organization – *“I use travel apps on my smartphone to organize my trip...”*

Navigation – *“I use [Google maps or similar apps] on my smartphone for direction and navigation...”*

Recommendations – *“I rely on my smartphone to give me push recommendations [such as via Foursquare]...”*

Online Reviews – *“I check online consumer reviews on my smartphone [such as via Yelp] to decide where to go, eat, and shop...”*

Search Deals – *“I use my smartphone to check for deals and discounts to purchase/book...”*

Social Network – *“I use [Facebook or other SNS apps] on my smartphone to connect, update my status and share pictures with others...”*

Table 1. Demographic Characteristics and Travel Frequency (*N* = 1126)

		Frequency	Percent
Gender	Male	680	60.4
	Female	442	39.3
Age	18 to 24 years	227	20.2
	25 to 34 years	600	53.3
	35 to 44 years	192	17.1
	45 to 54 years	74	6.6
	55 to 64 years	25	2.2
	65 years and over	8	.7
Education	Less than High School	6	.5
	High School / GED	109	9.7
	Some College	319	28.5
	2-year College Degree	102	9.1
	4-year College Degree	449	40.1
	Masters' Degree	108	9.7
	Doctoral Degree	11	1.0
	Professional Degree (JD, MD)	15	1.3
Income	Under \$20,000	132	11.7
	20,000-29,999	143	12.7
	30,000-39,999	173	15.4
	40,000-49,999	160	14.2
	50,000-59,999	114	10.1
	60,000-69,999	90	8.0
	70,000-79,999	99	8.8
	80,000-89,999	49	4.4
	90,000-99,999	51	4.5
	100,000-109,999	51	4.5
	110,000-119,999	8	.7
	120,000-129,999	11	1.0
	130,000-139,999	9	.8
	140,000-149,999	12	1.1
	150,000+	24	2.1
Travel Frequency	About once every other year	100	8.9
	About once a year	304	27.0
	2 – 3 times a year	507	45.0
	More than 3 times a year	209	18.6

Table 2. Mean Differences for Perceived Tourism and Technology Innovativeness

Tourism Innovativeness	Mean (s.d.)	Mean (s.d.)	t (sig.)
Income	< US\$60,000 (N = 722) 3.13 (.88)	US\$60,000+ (N = 404) 3.33 (.81)	3.75 (.00)
Travel Frequency	< Twice a year (N = 410) 2.96 (.87)	Twice+ a year (N = 716) 3.33 (.83)	7.10 (.00)
Technology Innovativeness	Mean (s.d.)	Mean (s.d.)	t (sig.)
Gender	Male (N = 680) 3.75 (.82)	Female (N = 442) 3.40 (.92)	6.69 (.00)
Education	< 4-yr College (N = 536) 3.68 (.84)	4-yr College+ (N = 536) 3.54 (.91)	-2.65 (.00)
Income	< US\$60,000 (N = 722) 3.57 (.88)	US\$60,000+ (N = 404) 3.69 (.87)	2.22 (.02)

Note: Only variables with statistically significant differences are presented.

Table 3. Mean Differences for On-Site Use of Smartphones

Trip Management	Mean (s.d.)	Mean (s.d.)	t (sig.)
Income	< US\$60,000 (N = 722) 2.77 (1.19)	US\$60,000+ (N = 404) 3.11 (1.12)	4.71 (.00)
Travel Frequency	< Twice a year (N = 410) 2.71 (1.16)	Twice+ a year (N = 716) 2.99 (1.17)	3.71 (.00)
Navigation	Mean (s.d.)	Mean (s.d.)	t (sig.)
Education	< 4-yr College (N = 536) 4.14 (.90)	4-yr College+ (N = 536) 4.33 (.90)	3.79 (.00)
Recommendation	Mean (s.d.)	Mean (s.d.)	t (sig.)
Age	< 35 y.o. (N = 536) 3.20 (1.17)	35+ y.o. (N = 583) 3.40 (1.13)	2.98 (.00)
Education	< 4-yr College (N = 536) 3.20 (1.17)	4-yr College+ (N = 536) 3.40 (1.13)	2.98 (.00)
Income	< US\$60,000 (N = 722) 3.19 (1.20)	US\$60,000+ (N = 404) 3.51 (1.04)	4.48 (.00)
Travel Frequency	< Twice a year (N = 410) 3.19 (1.13)	Twice+ a year (N = 716) 3.37 (1.16)	2.59 (.00)
Online Reviews	Mean (s.d.)	Mean (s.d.)	t (sig.)
Gender	Male (N = 680) 3.73 (.95)	Female (N = 442) 3.99 (.93)	-4.59 (.00)
Education	< 4-yr College (N = 536) 3.76 (1.00)	4-yr College+ (N = 536) 3.90 (.89)	2.43 (.02)
Income	< US\$60,000 (N = 722) 3.75 (.99)	US\$60,000+ (N = 404) 3.98 (.86)	3.96 (.00)
Travel Frequency	< Twice a year (N = 410) 3.72 (.98)	Twice+ a year (N = 716) 3.90 (.92)	3.00 (.00)
Search Deals	Mean (s.d.)	Mean (s.d.)	t (sig.)
Income	< US\$60,000 (N = 722) 3.26 (1.19)	US\$60,000+ (N = 404) 3.50 (1.12)	3.35 (.00)
Travel Frequency	< Twice a year (N = 410) 3.22 (1.17)	Twice+ a year (N = 716) 3.42 (1.16)	2.67 (.01)

Note: Only variables with statistically significant differences are presented.

Table 4. Correlation Matrix: Control, Independent, and Dependent Variables

Variables	Correlation Coefficients						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Control Variables</i>							
(1) Gender	—						
(2) Age	.10**	—					
(3) Education	n.s.	.09**	—				
(4) Income	n.s.	.09**	.28**	—			
(5) Travel Frequency	n.s.	n.s.	.08**	.08**	—		
<i>Independent Variables</i>							
(5) InTour	n.s.	-.07*	n.s.	.10**	.23**	—	
(6) InTech	-.20**	n.s.	-.08**	.07*	.06*	.42**	—
<i>Dependent Variables</i>							
Trip Management	n.s.	-.10**	.06*	.12**	.11**	.40**	.36**
Navigation	n.s.	n.s.	.11**	.06**	.08**	.06*	.21**
Recommendations	n.s.	-.12**	.08**	.12**	.06*	.38**	.33**
Online Reviews	.14**	n.s.	.07*	.10**	.08**	.23**	.19**
Search Deals	n.s.	-.08**	n.s.	.09**	.09**	.35**	.37**
Social Network	n.s.	n.s.	n.s.	n.s.	.09**	.41**	.28**

Note: * statistically significant at $p < .05$; ** statistically significant at $p < .01$; n.s. = not significant; $N = 1126$.

Table 5. Hypothesis Testing: Hierarchical Regression Analyses

	Dependent Variables					
	Trip Manag.	Navig.	Recomm.	Reviews	Search Deals	Social Network
Step 1						
R^2	.04	.02	.04	.04	.03	.01
R^2 Change	.04	.02	.04	.04	.03	.01
F	9.81***	3.76**	9.17***	9.67***	6.01***	n.s.
F Change	9.81***	3.76**	9.17***	9.67***	6.01***	n.s.
<i>Control Variables</i>						
Gender	n.s.	n.s.	n.s.	.15***	n.s.	n.s.
Age	-.12***	n.s.	-.13***	n.s.	-.09**	n.s.
Education	n.s.	.10**	n.s.	n.s.	n.s.	n.s.
Income	.13***	n.s.	.12***	.10**	.10**	n.s.
Travel Frequency	.10***	n.s.	.07*	.08*	.09**	.08**
Step 2						
R^2	.23	.07	.20	.10	.20	.19
R^2 Change	.18	.05	.16	.06	.17	.19
F	46.18***	11.12**	39.58***	18.46***	39.95***	37.56***
F Change	131.34***	29.03***	111.05***	38.78***	121.52***	126.50***
<i>Control Variables</i>						
Gender	.07*	n.s.	.07*	.17***	.10***	n.s.
Age	-.09***	n.s.	-.10***	n.s.	-.07*	n.s.
Education	.06**	.13***	.08**	.06*	n.s.	n.s.
Income	.07***	n.s.	.07*	.17**	n.s.	-.06*
Travel Frequency	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
<i>Independent Variables</i>						
Tourism Innovativeness	.27***	n.s.	.26***	.16***	.21***	.37***
Technology Innovativeness	.25***	.25***	.23***	.15***	.30***	.14***

Note: * statistically significant at $p < .05$; ** statistically significant at $p < .01$; *** statistically significant at $p < .001$; n.s. = not significant; $N = 1126$.