HOW DO TRAVEL APPS AFFECT STUDENT'S VISIT EXPERIENCE AND PLACE ATTACHMENT IN LOCAL TRAVEL? THE MODERATING ROLE OF UNIVERSITY IMAGE

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Abstract: The lockdown of the COVID-19 pandemic has stimulated local travel activities, and college students have become the main tourists in this kind of tourism. As newcomers to the home city of the university, students may show more curiosity about exploring and learning the new living environment. College students may cultivate a strong attachment to their university when they have learnt in depth about their new living home. Lockdown at home has aroused students' desire and need to travel, and offered these potential tourists sufficient time to plan their trip via mobile travel apps. Therefore, this study investigated the relationship between college student's using behavior of travel apps and the place attachment in the home city to their university. Present, tourists have become to enjoy planning and designing their trip by themselves, and travel apps are expected to offer more fun when offering information. Perceived enjoyment was thus adopted as an external variable, and the image of university was adopted as a moderating factor in the extended TAM model. Regarding that Macau is a famous destination with historical heritage and owns several international universities, a survey was conducted with a valid sample of 153 college students studying in Macau. Results showed that perceived usefulness and perceived enjoyment mediate the relationship between ease of use and visit experience. Student's visit experience has a significant effect on place attachment of the city where their universities are located. And image of university moderated the relationship between visit experience and place attachment. This study contributed to discovering the psychological influence of mobile technology on the new generation of college students. Practical implications and limitations are discussed accordingly.

Keywords: travel apps, place attachment, TAM, college student, Macau

Introduction

Local travel activity is a popular choice for college students to spend their leisure time during the pandemic. Following rapid growth of 8 million enrollment in colleges and universities annually (National Bureau of Statistics, 2019), the college student has expanded into a large market for city tourism in China. Even in the pandemic year of 2021, the tourism expenditures of college students have increased by 42% at 372 U.S dollars per trip over the summer break (Ctrip, 2021). Especially, college students show special interests on city tourism when their universities are located in a tourism destination (Chhabra, 2010). This phenomenon has become common in the city of Beijing, Shanghai, Nanjing, and Hangzhou, which are famous destinations and high education bases (Ctrip, 2021). To meet the demands of this market, the authority has launched policies to support students for participating in city heritage tourism. For example, Beijing opens a special line for student to travel around the historical

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sites and experience the changes of ancient dynasties (Liu, 2022). Macau provides ten free travel lines with eight themes for students to travel around the city. Facilities, including heritage sites, museums, and theaters, are free open for students. And tourism activities, like Bungee jump, drama, and exhibitions, are also free for student tourists (DSEC, 2022). Such phenomena illustrate that tourism in home city of the university is a potential trend for the market segment of college students.

Although many scholars and industry practitioners have discussed travel motivations and behavioral pattens of student group (Davies & Cairncross, 2013), few studies have focused on the context of city tourism. Moreover, previous studies have only used traditional motivation theory to investigate the satisfaction and experience of student tourists (e.g., Davies & Cairncross, 2013; Ruhanen et al., 2013), and rarely mentioned the psychological impact brought by the city that is related to their universities. In this regard, it is necessary to discover the characteristics of student tourists and their psychological changes regarding the city.

Using internet-based applications (apps) to plan trip is an important feature of college student tourists (Davies & Cairncross, 2013). With the development of smartphones, mobile-based apps have quickly taken over the tourism market. According to the China Internet Network Information Center (CNNIC, 2014), 25.2% (133 million) of 527 million smartphone users have paid for tourism-related service via apps. Compared to traditional internet-based apps, mobile apps offer vivid, reliable, and convenient services to tourists (Xia et al., 2018). For instance, the Augmented Reality (AR) guide on smartphones now provides a powerful location awareness, and enriches the interaction between tourists and the urban fabric of heritage sites via the 3D scan function (Shih et al., 2019). Therefore, exploring the user experience of mobile-based apps in city tourism is valuable to elaborate on the characteristic behaviors of student tourists, revealing the first research gap in this study.

Place attachment has been widely discussed in tourism studies to understand the relationship between tourists and destinations (Dwyer et al., 2019). The place attachment to the home city of the university can be more complex, because college tourists also act as student who can cultivate a sense of belonging and attachment to the campus and their living city (Chow & Healey, 2008). In other words, the place attachment to the home city is affected by college tourist's visit experience and the perception of their universities. Although previous studies have discussed the place attachment of destinations and schools separately (e.g., Loureiro, 2014; Moghisi et al., 2015), few studies have explored these two synchronous factors in the context of city tourism. Therefore, this is the second research gap that must be filled.

The technology acceptance model (TAM) provides a theoretical lens for interpreting users' attitudes or adoption behaviors of smartphones (Kim et al., 2008). Furthermore, the former research stream focus on using experience of technology (e.g., No & Kim, 2014; W.j. Lee & Kim, 2021). With the development of smart tourism, using technology has become an essential part of traveling (Neuhofer et al., 2014). In this regard, adopting technology can directly affect the overall visit experience. However, few researchers have established a research model to bridge the gap between virtual technology and actual visit experience. This indicates a third research gap.

In this study, Macau is selected as the study context. According to Macau Statistics and Census Bureau (DSEC, 2021), there are ten higher education schools (including four public and six private universities/colleges) with 36107 enrolled students in Macau. In addition, Macau owns rich tourism resources (including UNESCO Heritage Sites and over 15 annual events) and has witnessed a peak of visitor arrivals in 2019 before the pandemic (DSEC, 2021). Thus, Macau is an excellent case for investigating the psychology and behavior of college student tourists. To fill in the three research gaps

identified, this research aims to (1) establish and validate a TAM-based model with the mediating variable of perceived enjoyment; (2) explore the mediating role of visit experience; (3) explore the moderating role of university image between the relation between visit experience and place attachment.

Literature review

TAM model

The TAM is widely used to explain users' acceptance of information technologies (Davis, 1989). The TAM model interprets individual's behavioral intention of using a "technology" (updated software and hardware) by two perceived assessments: its usefulness and its ease of use toward users (Bruner II & Kumar, 2005). In the present study, perceived usefulness refers to the degree to which a tourist expects mobile apps will improve the travel experience. And ease of use refers to the extent of effort to which a tourist spends to use mobile apps to plan a trip. A large number of empirical studies have identified that ease of use is related to the perceived usefulness (e.g., Davis et al., 1992; Xia et al., 2018). Thus, the following hypotheses are formulated:

Hypothesis 1. Ease of use has a positive influence on college tourists' perceived usefulness of travel apps.

Perceived Enjoyment

Perceived enjoyment (PE) is defined as "the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" (Davis et al., 1992, p. 1113), which is indicated as an intrinsic motivation influencing users' behaviors in TAM model. In the current study, perceived enjoyment refers to the degree of pleasure that college students experienced when using travel apps in their trip.

Previous studies have verified that an easy operating system can be perceived to be enjoyable and favorable (Sheppard et al., 1988). Burner (2005)'s empirical study also supported that ease of use (EOU) positively affects perceived enjoyment. Perceived enjoyment, perceived usefulness (PU), and perceived ease of use are significant antecedents of usage experience toward technology (Davis et al., 1992; Moon & Kim, 2001). With the development of smart tourism, tourist's online experience of mobile apps has no doubt to belonging to their visit experience (VE) (Xia et al., 2018), as using mobile apps to plan trips can be regarded as a pre-travel behavior (Wang et al., 2014). In this regard, perceived enjoyment, perceived usefulness, and perceived ease of use should affect tourists' visit experience to certain destinations. Therefore, hypotheses between ease of use, perceived usefulness, and perceived enjoyment are formulated as follows:

Hypothesis 2. Ease of use has a positive influence on college tourists' perceived enjoyment of travel apps.

Hypothesis 3. Ease of use has a positive influence on college tourists' visit experiences.

Hypothesis 4. Perceived usefulness of travel apps has a positive influence on college tourists' visit experiences.

Hypothesis 5. Perceived enjoyment of travel apps has a positive influence on college tourists' visit experiences.

Place attachment

Place attachment (PA) of tourist can be defined as "a positive connection or bond between a tourist and a particular destination", which is originated from attachment theory (Williams & Vaske, 2003). Although tourism researchers have explored large numbers of antecedents of place attachment (J. Y. Lee, 2009), there are mainly three realms of place attachment verified as past, present, and future (Dwyer et al., 2019). Past and future refers to the memory and expectation of destinations respectively (N. C. Chen et al., 2014). While present dimension has attracted most research attention, which involves place identity and dependence (Williams & Vaske, 2003), and interaction with natural and social environment (Kyle et al., 2005). Specifically, tourist's experience runs through these three dimensions, because tourism helps people construct memories, and achieve expectations by creating experience (Kahneman, 2011; Dwyer et al., 2019). Besides, experience is associated with the interaction between tourists and destinations, such as delivering service and using facilities (Loureiro, 2014). In conclusion, tourist's visit experience is an important antecedent to place attachment.

Although empirical evidence has revealed a significant relationship between visit experience and place attachment (Cardinale et al., 2016; Dwyer et al., 2019), seldom studies have focus on the group of college tourists living in tourism destination. Specifically, as a kind of residents of a tourism destination, college students may experience more interaction with the residents than normal tourists. And this social bond is prominent in creating loyalty and attachment among certain place (Campbell et al., 2006). In other word, their strong place attachment, which is similar to a psychological commitment, can be cultivated from the experience of tourism activities or campus lives within the destination (N. Chen et al., 2015). Thus, the following hypothesis is formulated:

Hypothesis 6. Visit experiences has a positive influence on college tourists' place attachment among the home city of their universities.

University image

Place image has been widely discussed in former studies as the individual's perception (including beliefs, ideas, and impressions) toward a place (Selby & Morgan, 1996; Kotler & Keller, 2003). From this view of point, university image can affect college student's attachment among the city of their university, because the place attachment is related to individual's emotions, beliefs, and feelings (Proshansky et al., 2014), such as memory and expectation on campus life. Specifically, the influence process of visit experience on place attachment is based on the social and environmental interactions (Moghisi et al., 2015), while these interactions mostly happened in the campus. Therefore, the image of university may influence the impact of experience on place attachment. The research model of this study is presented in Figure 1.

Hypothesis 7. University image moderates the influence of visit experience on college tourists' place attachment among the home city of their universities.
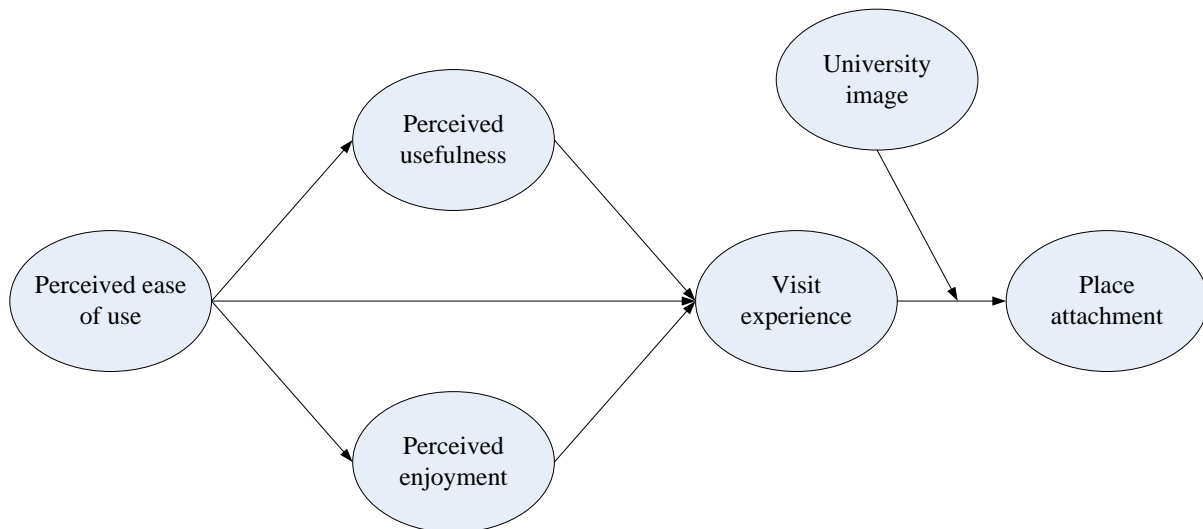
Figure 1. Research model of the study.

Method

Measurement

The scale of the current study is derived from the following studies: both the items of perceived usefulness and perceived ease of use are adopted from the study of Davis (1989), perceived enjoyment items are modified from Hur (2007). Visit experience are adopted from Godovykh and Tasci (2020), which contains three facets of pre-visit, onsite, and post-visit experiences. Place attachment items are developed from Boley et. al. (2021). And university image is measured by three items from Eger, Egerová, and Pisoňová (2018) (details in Table 1).

Data collection and analysis procedures

The current study used proposed sampling to determine eligible respondents for two key criteria. First, the respondents had to be university students in Macau. Second, the respondents had to travel Macau for tourist sites during their study period. The questionnaires were distributed in Macau over five weeks from March 16 to April 12, 2020. A total 153 valid questionnaires were collected. The number of valid questionnaires satisfied the requirement of 0.01 significance level with 0.8 adequate power calculated by the G* Power program (Kadam & Bhalerao, 2010; Hair Jr, et al., 2016).

WarPLS 7.0 were adopted to perform the analysis, which provided comprehensive reports of measurement and structural models. The internal consistency of the variables was assessed by Cronbach's alpha (CA) and composite reliability (CR) values, and the criteria for both were above 0.7. The convergent validity was assessed by factor loadings and average variance extracted (AVE). Factor loadings of individual items should be above 0.7 with a significance of $p < 0.01$, and the AVE for all variables should be above 0.5. The Fornell-Larcker criterion and the heterotrait–monotrait ratio (HTMT) were adopted to test the discriminant validity (Fornell & Larcker, 1981; Henseler et al., 2015).

Results

Within the 153 respondents, 107 participants (46.4%) were male, and 69 participants (53.6%) were female. The reliable and valid analysis of scale items were summarized in Table 1.

Table 1. Confirmatory factor analysis results (N=153).

Factors	Loadings	Cronbach's α	CR	AVE
Factor 1: EOU		0.838	0.881	0.554
Travel apps are easy to learn.	0.740			
Travel apps provide good guidance on trip planning.	0.774			
Travel apps have easy and flexible functions.	0.749			
Travel apps is easy to prevent loss.	0.733			
Travel apps have good interaction.	0.705			
Overall, travel apps are easy to me.	0.760			
Factor 2: PU		0.875	0.906	0.616
Travel apps improve the trip quality.	0.785			
Travel apps satisfy my journey needs.	0.805			
Travel apps can access to useful information.	0.840			
Travel apps are time saving.	0.730			
Travel apps are effective on trip planning.	0.754			
Overall, Travel apps useful to me.	0.793			
Factor 3: PE		0.839	0.892	0.674
Travel apps give enjoyments to me on planning a trip.	0.791			
Travel apps entertain me.	0.838			
Using travel apps is pleasant.	0.810			
Using travel apps is interesting.	0.845			
Factor 4: VE		0.847	0.908	0.767
Macau appeals to me.	0.892			
Macau makes a strong impression to me.	0.918			
Macau changes my lifestyle.	0.816			
Factor 5: PA		0.822	0.894	0.738
Macau is very special to me.	0.841			
Macau means a lot to me.	0.903			
Macau is the best place for my lifestyle.	0.832			
Factor 6: UI		0.931	0.956	0.878
My university is attractive.	0.935			
University equipment is modern.	0.945			
Teaching and learning are engaging.	0.931			

Note: EUO=Ease of use; PU=Perceived usefulness; PE=Perceived enjoyment; VE=Visit experience; PA=Place attachment; UI=University image.

AVE=Average variance extracted; CR=Composite reliability.

All factor loadings were standardized and were significant at the 0.001 level.

The CA and CR values of each factor are greater than 0.7, and factor loadings of individual item are above 0.7 (table 1). Thus, the reliability of the measurement model is established. All AVE values are greater than 0.5. Therefore, the convergent validity was confirmed. The results of discriminant validity test are shown in table 2. In matrix of the Fornell-Larcker, values on diagonal are greater than the off-diagonal values. All HTMT values are not higher than 0.9, thus the discriminant validity is confirmed.

Table 2. Fornell-Larcker and HTMT (Heterotrait–Monotrait Ratio) criterion testing.

	Fornell-Larcker testing						HTMT testing				
	EOU	PU	PE	VE	PA	UI	EOU	PU	PE	VE	PA
EOU	0.744										
PU	0.723	0.785					0.815				
PE	0.718	0.760	0.821				0.792	0.889			
VE	0.716	0.712	0.788	0.876			0.734	0.820	0.835		
PA	0.657	0.607	0.742	0.694	0.859		0.691	0.714	0.791	0.832	
UI	0.357	0.213	0.427	0.295	0.752	0.937	0.406	0.237	0.481	0.335	0.860

All hypotheses are significant and supported at p < 0.01, except H7 (supported at p < .05). Ease of use positively influences perceived usefulness and perceived enjoyment, with a path coefficient of 0.799 and 0.748. Visit experience is significant related to ease of use, perceived usefulness, and perceived enjoyment a high explained variance of 0.75. The moderating effect of university image is negative and weak with the coefficient of -0.144 (details in figure 2 and table 3).
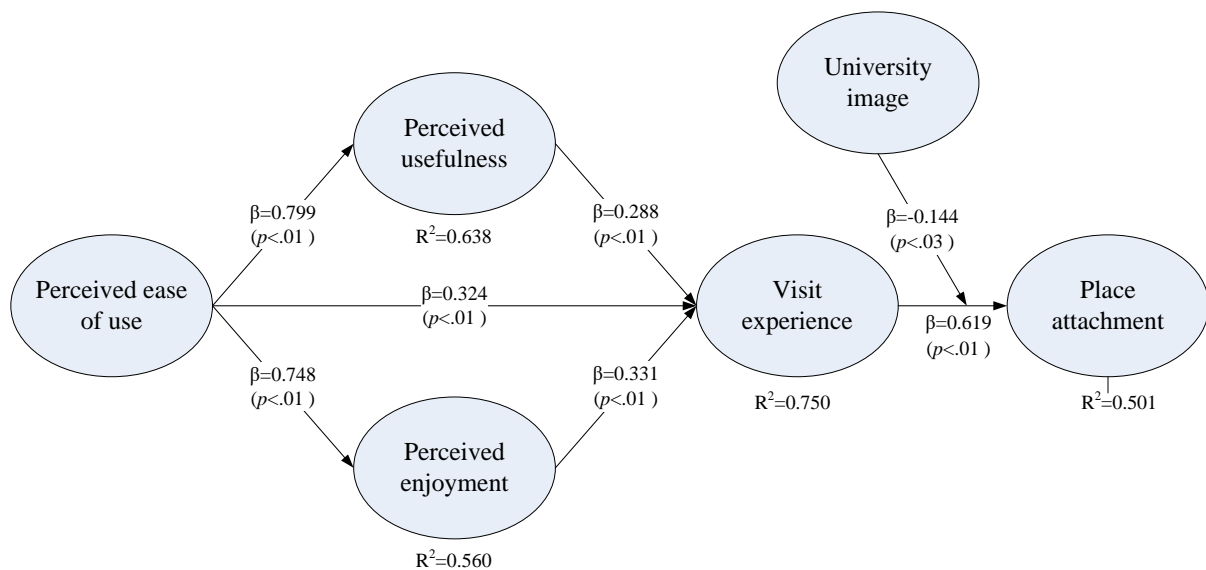

Figure 2. The results of structured model testing.

Table 3. Results of direct effects (N = 153).

Hypothesis	Path	Standard coefficient	t-value	Result
H1	EOU→PU	0.799	11.778	Support
H2	EOU→PE	0.748	10.908	Support
H3	EOU→VE	0.324	4.299	Support
H4	PU→VE	0.288	3.792	Support
H5	PE→VE	0.331	4.403	Support
H6	VE→PA	0.619	8.775	Support
H7	UI→VE*PA	-0.144	-1.837	Support

Discussion

Although university students are not considered as pure tourists to their living city, the COVID-19 pandemic has turned these people into a special kind of tourist. The fear of coronavirus has forced people to choose staycation, which has raised scholar's interest in studying the psychological characteristics and experience of these tourists/residents (Wong, et al., 2021). The long-time lockdown offers tourists more chance to use smartphones in the pre-visit stage. Thus, the empirical evidence of this study supports that the perception of using travel apps has become a more influential antecedent of the tourist experience. To highlight the characteristics of local travellers, the current study chooses local university students as study context. The SEM results reveal that the visit experience significantly affects place attachment. This finding is consistent with the existing literature (Cardinale et al., 2016; Dwyer et al., 2019). However, the perceived university image plays a negative moderating role in affecting the relationship between experience and place attachment. In this regard, the local tourists/residents may be influenced by their familiar environment when traveling around the city. The university image may partially replace the impact of visit experience. This finding is seldom mentioned in previous studies, and most previous studies only focus on the positive effect of place image (Elliot, Papadopoulos, & Kim, 2011).

Conclusion

With the normalization of COVID-19 pandemic, local travel has become a popular choice for tourists, and the college students have become one of the major forces in this market. The current study explores how local travel experience may affect their attachment to the living city. The image of university was also identified to moderate how visit experience affects place attachment. The results are helpful for understanding the group of student tourists, as well as the role of colleges in tourism destination. Moreover, this study focuses on the phenomenon that student may access travel apps more frequently in the pandemic period. Specifically, their enjoyment of using these apps may positively affect their follow-up visit experience. This result has extended the TAM model through bridging the online perception and offline experience.

Implications

This study contributes to bridging the using perception of smartphone apps with actual visit experience, while previous research mainly concentrates on the online experience (e.g., Xia et al., 2018; Eneizan, et al., 2020). This study also highlights the influential role of perceived enjoyment in affecting visit experience, as the enjoyment of browsing travel apps may be considered as an extended process of

travel. Given these findings, destination managers should work with apps developer to improve the software quality.

In addition, the current study extended the TAM model with place attachment via the mediating factor of visit experience. Although place attachment has been widely discussed in tourism (Dwyer et al., 2019; Hernández et al., 2020), less research has focused on the impact of technology on place attachment. The TAM model provides a theoretical base to fill in this gap. The results of this study demonstrate that the perceptions of using travel apps have indirect influence tourist's place attachment. Tourism researchers and practitioners should notice the power of technology in changing tourist's psychological characteristic and behavioral pattern, especially when smartphone has become a major way for entertainment and social.

This is the first study is to verify the moderating role of university image in assessing the psychological characteristic of local university tourists. University image plays a vital role in affecting student's perception in travel, which may even diminish the influence of the actual visit experience. Previous studies in the field of tourism have not discovered this potential problem. In this sense, the destination should notice the influence of the usual environment on local tourists. On the one hand, destination managers should use usual environment to counteract the negative effect of failed visit experience. On the other, covering up the potential impact of usual environment is still a discussable question in delivering a good experience of local travel activities.

Limitations and future research

There are several limitations of this study that require further investigation. First, the sample was limited to university students in Macau. The findings may be different from the non-student residents and the local tourists in other cities. Future study may collect data from a broader research context. Second, the research context of the current study is mainly based on the COVID-19 pandemic. The pandemic obviously limits tourist's choice on destination. In this regard, future study should focus on whether local travel activities (or staycation) are still a common choice for most tourists.

Furthermore, the development of mobile technology has significantly changed the traditional research context in tourism, and the perception of using travel apps has become a part of visit experience. Although the pandemic of COVID-19 has contributed to a high demand of local travel, less focus has been placed to explore the psychological antecedents and travel behaviors of local tourists/residents. Future studies are encouraged to fill this research void.

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