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A Study of Tourism Advertising Effects: Advertising Formats and Destination Types

1. Introduction

The wide usage of advertising in tourism has resulted in greater attention to the evaluation of tourism advertising effects. In tourism literature, evaluating advertising effects has largely focused on consumers' responses to advertisements (Kim, Hwang, & Fesenmaier, 2005). The measurements of this approach vary between different studies. Generally speaking, in tourism research, two aspects emerged from the evaluations of advertising effectiveness: behavioral aspects and cognitive aspects. Behavioral aspects were naturally adopted first. Represented in conversion studies, behavioral aspects evaluate tourism advertising effects via the "cause of visits and sales," with a particular focus on visitation number and travel expenditure, etc. (e.g., Burke & Gitelson, 1990; Woodside & Reid, 1974). The method of conversion studies was widely examined in academia and practice. At the same time, suggestions for improving the accuracy of this method came along, and thus, cognitive aspects emerged. Cognitive aspects, referring to awareness of the destination, influences of further information inquiries, attitudes, etc., were added to the dependent variables evaluating tourism advertising effects (e.g., McWilliams & Crompton, 1997; Kim, Hwang, & Fesenmaier, 2005; Byun & Jang, 2015).

Interestingly, general marketing research has long noted that individuals' responses to advertising are hierarchical with three primary stages: cognition, affect, and behavior (e.g., Barry & Howard, 1990). As a result, advertising effect models that reflect these three stages were proposed and examined in consumer goods marketing research, represented by the AIDA

(Attention, Interest, Desire, Action) model, DAGMAR (Awareness, Comprehension, Conviction, Action) model, and so on. However, this notion has been constantly missing in tourism research. The concept of advertising effects in tourism research has been defined and tested by different variables that were selected arbitrarily without consistent and sound reasoning (e.g., Byun & Jang, 2015; Li, Huang, & Christianian, 2016). A structured framework of tourism advertising effects remains omitted in tourism research.

Due to the remarkably rapid development of information technology, the advertising world today has also grown rapidly, thus generating many emerging advertising formats (Guttentag, 2010). For example, virtual reality (VR) technology is becoming more and more prevalent in the tourism industry, as it is used widely in destination marketing (Huang et al., 2016). However, there has been only few academic research to investigate the advertising effects of VR. A considerable amount of existing studies have still been examining the advertising effects of traditional formats, such as print, audio, video, etc.

This study aims to propose a framework of tourism advertising effects, following the three hierarchical stages of cognition, affect, and behavior, and furthermore, empirically examine this framework. Thus, a 2 (destination type: cultural vs. natural) \times 3 (advertising format: print vs. video vs. VR) experiment was designed and tested in this study. Additionally, four research objectives will be achieved in this study: 1) to develop a framework of tourism advertising effects; 2) to examine the impacts of different destination types (cultural vs. natural) on tourism advertising effects; 3) to test the impacts of various advertising formats (print vs. video vs. VR) on tourism advertising effects; 4) to investigate the interaction effects of destination types and advertising formats on tourism advertising effects.

2. Literature Review

2.1 Advertising effects

In tourism research, the definition of advertising effects has been widely agreed as consumers' responses to advertisements (Kim, Hwang, & Fesenmaier, 2005; Byun & Jang, 2015; Choe, Stienmetz, & Fesenmaier, 2017). Despite of the commonly accepted definition, the measurements of this concept are greatly different in tourism studies. Based on the ideas of conversion studies, variables within the behavioral aspects were first adopted in tourism research to measure advertising effects (Kim, Hwang, & Fesenmaier, 2005).

Serious concerns with the validity of conversion studies were raised in the 1990s. This approach is particularly criticized because it focused more on actual visits, but failed to incorporate the cognitive dimensions that might not bring about immediate behavioral responses but rather long-term attitudinal and behavioral changes (Weilbacher, 2003). Thus, cognitive aspects, such as awareness of the destination, attitude, etc., were added to assess tourism advertising effects (e.g., McWilliams & Crompton, 1997; Byun & Jang, 2015).

In addition to behavioral and cognitive aspects, a few variables in affective aspects were also adopted to measure tourism advertising effects in recent publications, such as consumers' interest and desire toward destinations (Li, Huang, & Christianian, 2016). Yet, only scant research has used these affective variables. To sum, the review of existing tourism literature shows that tourism advertising effects has been tested by different variables within behavioral, cognitive and affective aspects. These variables include awareness, utility of travel information, attitude, interest, desire, credibility, and behavioral intention, etc. and they seem to be selected in an arbitrary fashion (e.g., Byun & Jang, 2015; Li, Huang, & Christianian, 2016).

General advertising studies have used hierarchical models demonstrating human responses to advertisements for several decades (e.g., Barry & Howard, 1990), among which

AIDA and DAGMAR are the most frequently used and examined. AIDA model (Attention, Interest, Desire, Action) was first proposed by Strong (1925). Ever since Strong, a number of similar hierarchical models have been proposed. For example, Colley (1961) proposed DAGMAR model of the advertising process that implies the advertising effects through four levels of consumers' understanding of the product/brand: from awareness to comprehension, to conviction, and finally, to action.

To conclude, general advertising effect models suggest a series of psychological and mental responses of consumers to advertisements before they reach the point of purchase action. These responses can be summarized into three hierarchical stages: cognition, affect, and behavior. However, neither the hierarchical feature nor the three stages of human responses to advertisements were discussed or investigated in tourism advertising effects studies.

2.2 AUIDCA framework for tourism advertising effects

To fill up the abovementioned research gap in tourism literature, the present study proposes a structured framework of tourism advertising effects. Drawing from the previous literature on advertising effects, six variables in hierarchy are proposed in the AUIDCA framework: Attention, Utilitarianism, Interest, Desire, Credibility, and Action (Fig. 1). The framework incorporates the three stages of the hierarchical model: "Attention" and "Utilitarianism" are cognitive aspects, "Interest," "Desire," and "Credibility" are affective aspects, and "Action" is related to behavioral aspects.

Attention, Interest, Desire, and Action are widely accepted advertising effects measurements in general advertising research for consumer goods (e.g., Graham & Havlena, 2007; Patti, 1979; Yoo, Kim, & Stout, 2004). Another two constructs are added to measure the tourism advertising effects in AUIDCA framework: Utilitarianism and Credibility, drawn upon

tourism research on advertising effects (e.g., Choi & Rifon, 2002; Kim, Chung, & Lee, 2011). It has been well documented that tourism products are different from consumer goods due to the unique intangible and inseparable characteristics (e.g., Gonza Iez, 2008; Govers, Go, & Kumar, 2007). To this end, tourism advertising is more important to tourists as they cannot try the products in advance and the consumer experiences only occur after they make the purchase and arrive at destinations. Thus, tourism advertisements with useful information that helps consumers establish their perceived credibility and trust are especially vital (Loda, Norman, & Backman, 2005). It has been argued by tourism scholars that utility of the advertising information and perceived credibility of consumers are two most important variables that make tourism advertising successful (Kim, Hwang, & Fesenmaier, 2005; Lavidge & Steiner, 1961).

In addition, the AUIDCA framework in this study proposes the hierarchical relationship between six variables. The hierarchy of Attention → Interest → Desire → Action has been widely accepted in general advertising literature. Research argued that effective advertising should provide consumers useful information right after gaining their attention (Lavidge & Steiner, 1961). Thus, “Utilitarianism” is added following “Attention” in the proposed AUIDCA framework. Consumers take risks when making purchase decisions for tourism products due to its intangibility feature. To that end, information obtained from a tourism advertisement may not immediately yield purchases by consumers, no matter how interesting the displayed stimulus with advertising message is (Wijaya, 2012). Consumers tend to confirm the authenticity and credibility of the advertising information before they decide to take action. Thus, “Credibility” is added prior to “Action” in the proposed AUIDCA framework.

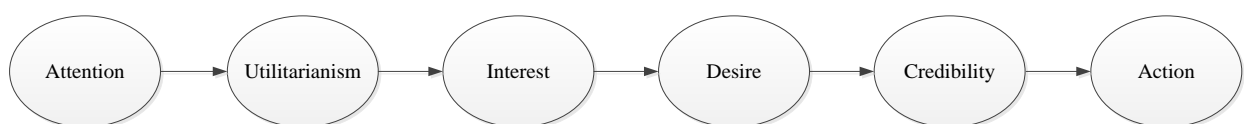


Fig.1. The proposed AUIDCA framework

2.3 The conceptual framework and hypotheses

Studies on tourism advertising effects have identified a variety of internal and external factors that influence consumers' responses to tourism advertisements. Internal factors refer to advertisement design elements that influence consumers' responses, including types of destinations or attractions (e.g., Byun & Jang, 2015; Chaudhuri & Micu, 2014), objects presented in the advertisements (e.g., language, pictures, texts, etc.) (e.g., Byun & Jang, 2015; Lewis, Whitler, & Hoegg, 2013), and advertising presentation formats via media (e.g., audio, video, print, Internet, etc.) (e.g., Decrop, 2007). External factors denote to consumers' characteristics that influence consumers' responses, such as, age, mood, etc. (e.g., Beukeboom & Semin, 2006).

To further confirm and verify the AUIDCA tourism advertising effects framework, impacts of destination type and advertising format on tourism advertising effects are proposed in the present study. Figure 2 presents the conceptual framework with three hypotheses as follows.

2.3.1 Destination type

Multiple criteria can be used to categorize destinations or tourism attractions into different types. Different destinations design specific advertisements to effectively communicate the tourism information, including attractions, activities, etc. (Buhalis, 2000). Destinations in different types can influence consumers' responses to tourism advertisements (Byun & Jang, 2015). It has been commonly accepted that many destinations can be categorized into natural or cultural, even showing in UNESCO world heritage list category. Natural destinations usually feature significant natural phenomena allowing tourists to sightsee and relax, whereas cultural destinations may provide tourists with history, culture, and religious pilgrimage (Luo & Deng, 2008). However, the differences of tourists' responses to advertisements of destinations with natural scenery versus cultural landscapes are not examined in existing literature. This study

selects natural and cultural as two destination types to examine the differences of consumers' responses to tourism advertisements. The first hypothesis is proposed below.

H1: Consumers' responses to tourism advertisements are different between the cultural and natural destinations.

2.3.2 Advertising format

Advertising format refers to the presentation of the advertisements, such as print, audio, video, virtual environment, virtual reality, etc. (Burns & Lutz, 2006; Dahlén & Edenius, 2007). Each advertising format has its own strengths and weaknesses in communications with consumers (Chaudhuri & Buck, 1995; Wolf, Stricker, & Hagenloh, 2013). Studies have shown that different formats of advertisements tend to result in varied consumer responses (Byun & Jang, 2015; Decrop, 2007). For example, Kim, Hwang, and Fesenmaier (2005) examined tourism advertising effects of different media channels and found that print ads lead to more requests for travel information, whereas television ads appears to be more effective in increasing the awareness. The second hypothesis is therefore proposed as follows:

H2: Consumers' responses to tourism advertisements are different between three types of advertising formats: print, video, and VR.

2.3.3 Interaction effect between destination type and advertising format

It is worth noting that the effects of destination type on consumers' responses to a tourism advertisement could possibly differ by various advertising formats. As discussed prior, destination type and advertising format can both impact consumers' response towards tourism advertisements (Byun & Jang, 2015; Kim, Hwang, & Fesenmaier, 2005). Furthermore, these two variables may have an interaction effect on consumers' responses towards tourism advertisements. In other words, consumers' responses to tourism advertisements of a natural

destination might be distinct from a cultural destination when different advertising formats (print, video, and VR) are employed. Thus, the third hypothesis is proposed below:

H3: There is an interaction effect between destination type and advertising format on consumers' responses towards tourism advertisements.

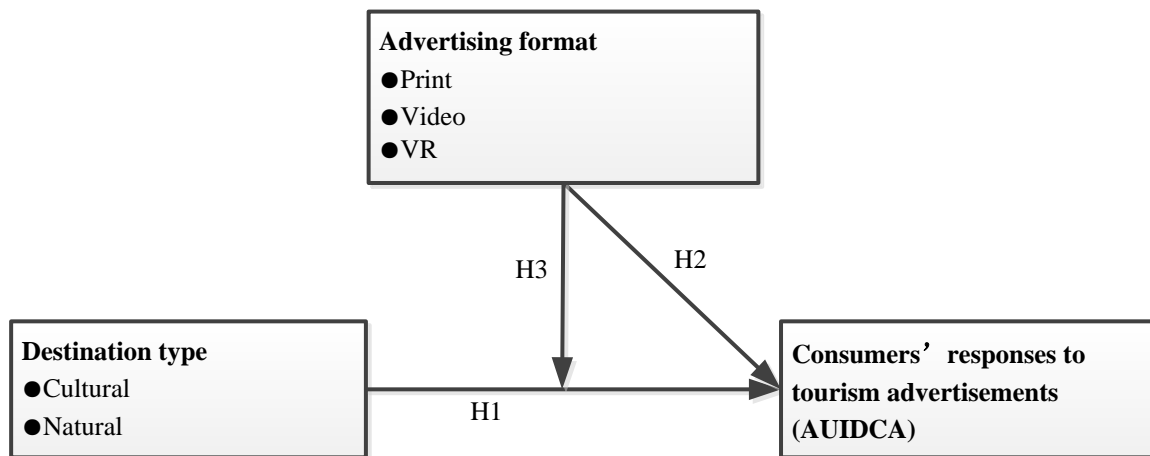


Fig.2. The conceptual framework of this study

3. Methods

3.1 Research design

The present study adopted a 2 (destination type: cultural vs. natural) by 3 (advertising format: VR vs. video vs. print) between-subject experimental design. As a result, six experimental conditions were generated, as shown in Table 1. Each participant of the experiment will be asked to view one advertisement among the six and answer a series of questions regarding their responses to the ads. Two world heritage sites located in China, Longmen Grottoes and Longhushan, were selected, representing the two types of destinations.

Three different forms of advertisement (VR, video, and print) were obtained from the official websites of each destination. Three ads for Longhushan were selected primarily featuring natural sceneries, while the ads for Longmen Grottoes demonstrate the cultural researches and

landscapes there. To manage the possible confounding variables in the experiment, the six ads for two destinations were originally obtained from the official destination websites and adjusted based on the following standards. First, three ads for each destination were designed with the similar landscapes and descriptions. Furthermore, the textual messages used in the three ads for each destination remained the same. Second, the print ads of both destinations were adjusted to the same style: 2-page brochures with four pictures and texts accordingly. Third, the lengths of video ads and VR ads were designed be approximately the same. They were all obtained from official destination tourism websites and each lasts about 2 minutes and 50 seconds.

Table 1 Experimental conditions

Experimental factors	Destination type		
		Cultural destination	Natural destination
Advertising format	VR	Cultural-VR	Natural-VR
	Video	Cultural-Video	Natural-Video
	Print	Cultural- Print	Natural- Print

3.2 Instrument development

Given that “Action” refers to the actual behavior of potential tourist to travel to a destination, A (Action) is dropped in the examination of the AUIDCA framework, as it cannot be directly measured. Thus, Attention, Utilitarianism, Interest, Desire, and Credibility will be tested as the dependent variables in this study.

The questionnaire assessed participants’ responses to tourism advertisements, including attention, utilitarianism, interest, desire, and credibility. The measurements for the five variables used in the questionnaire were first identified through the review of relating literature in general marketing and tourism marketing fields (Bousquie & Malicki, 2009; Byun & Jang, 2015; Hu, Su, & Zhang, 2012; Lam & Hsu, 2006; Lee et al., 2017; Li, 2010; Li, Huang, & Christianson, 2016; Kim, Chung, & Lee, 2011; Kim, Hwang, & Fesenmaier, 2005; Xu, 2015). The complete list of variables and measurement items are listed in table 2. All the measurements used a five-point

Likert scale with one as “strongly disagree” and five as “strongly agree”. The second section of the questionnaire included questions about the respondents’ demographic information, such as gender, age, education, and monthly income.

Then, the questionnaire was translated to Chinese and pre-tested in a pilot study with 60 Chinese consumers in Guangzhou. Two criteria were used in the beginning of the survey to select qualified respondents. First, the participants in this study should never visit the two world heritage sites. Thus the confounding effect of previous experiences of destinations could be avoided. Second, participants should age from 18 to 35 years old. The same criteria were used in the formal survey in the later stage. Chinese wording of some items were slightly modified to enhance clarity of the questions and to improve participants’ comprehension. The measurement development process involves procedures of translation and back-translation between Chinese and English. Authors’ bilingual background and familiarity with the tourism literature in Chinese and English well facilitated the process (Chen, Bao, & Huang, 2014).

Table 2 Variables and measurement items

Dependent Variables	Source
Attention	Bousquie and Malicki (2009);
This advertisement is very attractive	Hassan, Nadzim, and Shiratuddin,
This advertisement catches my attention	(2015); Li (2010); Lee et al. (2017)
Utilitarianism	Hu, Su, and Zhang (2012); Li,
This advertisement is helpful in making travel decisions	Huang, and Christianson, (2016);
This advertisement contains useful information	Kim, Hwang, and Fesenmaier (2005)
Interest	Li, Huang, and Christianson, (2016);
I hope to learn about history and culture of this place	Li (2010); Kim, Hwang, and
I would like to see more about this place	Fesenmaier (2005); Lee et al. (2017)
Desire	Byun and Jang (2015); Lam and Hsu
I plan to travel to this place	(2006) ; Li (2010); Lee et al. (2017)
If everything goes as I think, I would like to visit this place in the future	
Credibility	Ponte, Carvajal-Trujillo, and
I believe information presented in this advertisement is trustworthy	Escobar-Rodríguez (2015); Kim,
I believe information presented in this advertisement is real	Chung, and Lee (2011); Loda, Norman, and Backman (2005); Hu and Guo (2014)

3.3 Data collection and analysis

In terms of data collection, a field experiment was conducted using a questionnaire. Considering virtual reality is used in this study, viewers in different ages tend to react differently to the new technology (Guttentag, 2010; Morris & Venkatesh, 2000). It has been commonly accepted that Millennials (born 1983-2000) hold similar values and attitudes to technology advancement (Eastman et al., 2014; Gibson & Sodeman, 2014). Therefore, Chinese consumers from 18-35 years old are selected for this experiment to reduce the confounding effect of age. The selection criteria of the participants were the same as mentioned in section 3.2.

Data were collected by the following steps. Six professional research assistants who had professional training on quantitative data collection techniques were hired to collect data. After the screening questions, the procedure of this study was explained to each qualified participant and his/her willingness of participating in this study was confirmed. Then, one of the six advertisements was randomly provided to a qualified participant. Each participant took about two minutes and 50 seconds to complete viewing the shown advertisement. The print ads were viewed on the hard copy and VR ads and video ads were viewed on a smartphone. The VR was played by the “UtoVR” app and viewed on the smartphone through an output device called VR Box, through which participants can experience the 3-D simulated destination. All the participants were recruited in a public space with covered shelter along the Pearl River in Guangzhou, China so that they can view the ads clearly without the interference from the sunshine. Finally, after completing the advertisement, each participant was asked to fill out the questionnaire reporting their responses to the ads he/she just watched. Each participant will receive a small gift as compensation for their time upon the completion of the questionnaire. The research assistants were accompanying the participants the entire time of the experiment in order to instruct them the procedures in completing the experiment successfully and to ensure high

quality of the data (Abernethy & Franke, 1996; Wan et al., 2007). A total of 360 questionnaires were collected in this study; 53 questionnaires were excluded from the final analysis due to missing values, leaving the final sample to be 307.

The data were analyzed by SPSS 20 and Amos 21. Destination type (cultural vs. natural) and advertising format (VR vs. video vs. print) were independent variables and participants' attention, utilitarianism, interest, desire, and credibility towards the tourism advertisements were dependent variables.

4. Results

4.1 Sample profiles

The sample profiles are outlined in Table 3. Among the 307 valid samples, 52.8% (n=162) were male and 47.2% (n=145) were female. A majority of the participants (72.3%) received an associate degree or higher. Over 80% of the participants reported their profession as enterprise employee, self-employment or owner, and student. Most of the participants (65.1%) had a personal monthly income of more than 3,000 RMB (\$470).

Table 3 Sample file

		Frequency (n=307)	Percentage (%)
Gender	Male	162	52.8
	Female	145	47.2
Education	High school or below	85	27.7
	Associate degree	70	22.8
	Bachelor's degree	140	45.6
	Master's degree or above	12	3.9
Occupation	Enterprise employee	125	40.7
	Self-employment or owner	48	15.6
	Student	93	30.3
	Government official	21	6.8
	Other	20	6.5
Personal monthly income (RMB)	Less than 3,000	107	34.9
	3,001-6,000	129	42.0
	6,001-10,000	54	17.6
	10,001-15,000	10	3.3

4.2 AU IDC tourism advertising effect framework

Three steps were conducted to examine the AU IDC framework. First, the normality of the data was tested for skewness and kurtosis. Results indicated that skewness ranged from -0.645 to 0.124 and kurtosis ranged from -.644 to 1.523, suggesting the normal distribution of the data (Hair et al., 2006). Second, a confirmatory factor analysis (CFA) was conducted to verify the measurement model of the AU IDC framework. The CFA result proves the measurement model of AU IDC framework fits well with the data (Table 4).

Table 4 Items with descriptive statistics and results of CFA

Dependent Variables	Mean (SD)	Standardised estimate	AVE	CR
Attention				
This advertisement is very attractive	3.49 (0.82)	0.830	0.616	0.762
This advertisement catches my attention	3.63 (0.83)	0.737		
Utilitarianism				
This advertisement is helpful in making travel decisions	3.85 (0.65)	0.914	0.604	0.746
This advertisement contains useful information	3.93 (0.68)	0.611		
Interest				
I hope to learn about history and culture of this place	4.01 (0.65)	0.807	0.617	0.763
I would like to see more about this place	3.93 (0.63)	0.763		
Desire				
I plan to travel to this place	3.53 (0.78)	0.796	0.571	0.726
If everything goes as I think, I would like to visit this place in the future	3.87 (0.84)	0.713		
Credibility				
I believe information presented in this advertisement is trustworthy	3.79 (0.74)	0.784	0.557	0.715
I believe information presented in this advertisement is real	3.94 (0.73)	0.707		

Model fit indices: $\chi^2/df = 1.467$, NFI= 0.955, CFI= 0.985, GFI= 0.977, AGFI= 0.950, RMSEA= 0.039.

Third, the hypothesized hierarchical relationships between the variables in the AU IDC framework were tested using SEM. As shown in Figure 3, the model fit indices satisfied the cut-off points. The causal relationships from Attention to Utilitarian to Interest to Desire and finally to Credibility are proved to be significantly positive. Therefore, the AU IDC tourism advertising effect framework is verified and confirmed with five variables that are hierarchically

related.



Fig.3. The AUIDC tourism advertising effect framework

4.3 Manipulation checks

To avoid the possibility that the measurement of dependent variables and the assessment of manipulations biasing each other due to their ordering (Hautz et al., 2014; Khan, 2011), manipulation checks were conducted separately from the main study followed the approach suggested by Kidd (1976). Based on this background, a separate study (n=60) was carried out, whose sole purpose was to verify that the manipulations were as intended (Kidd, 1976; Perdue & Summers, 1986). For the manipulation check of participants' perceived type of destination, results of an ANOVA test showed that participants who engaged in the advertisements of the world cultural heritage site perceived them as more cultural than those who were involved in the advertisements of the world natural heritage site ($F_{(1,58)}=232.72$, $p<0.001$; $M_{\text{cultural}} = 4.23$, $SD = 0.63$ vs. $M_{\text{natural}} = 1.83$, $SD = 0.59$). For the manipulation check of participants' perceived type of media, following the method suggested by (Magnini & Kim, 2016), respondents were asked: 'Is this advertisement played on VR', 'Is this advertisement played on video', or 'Is this advertisement printed on brochure', and responded 'yes' or 'no'. All three media performed as intended in this manipulation check. Therefore, the manipulation checks were confirmed as successful for both participants' perceived type of destination and type of media.

4.4 Experiment hypothesis testing

The MANOVA test indicated significant main effects for destination type (Wilk's $\lambda=0.931$, $p = 0.001$) and advertising formats (Wilk's $\lambda=0.734$, $p < 0.000$). In addition, the interaction effect was also significant (Wilk's $\lambda = 0.913$, $p = 0.002$). Considering the significance of the MANOVA test, the study proceeded with a series of the 2 (destination type: cultural vs. natural) x 3 (advertising format: VR vs. video vs. print) between- subject ANOVA analysis (Tables 5-9).

4.4.1 Main effect of destination type

The ANOVA analysis revealed a significant main effect of destination type on participants' attention ($F_{(1,301)} = 5.160$, $p = 0.024$), desire ($F_{(1,301)} = 4.946$, $p = 0.027$), and credibility ($F_{(1,301)}=8.173$, $p=0.005$) towards tourism advertisements, but not on utilitarianism ($F_{(1,301)}=1.015$, $p = 0.315$) and interest ($F_{(1,301)}=0.047$, $p = 0.828$) (Tables 5–9). Specifically, as shown in Fig.4, participants paid more attention ($M_{\text{natural}}=3.65$ vs. $M_{\text{cultural}} =3.47$) and reported higher credibility ($M_{\text{natural}}=3.97$ vs. $M_{\text{cultural}} =3.77$) to ads for natural heritage site than ads for cultural heritage site. Yet, participants showed less desire for the natural heritage site than the cultural heritage site ($M_{\text{natural}} = 3.61$ vs. $M_{\text{cultural}} = 3.79$).

Table 5 ANOVA results for consumers' attention

	SS	df	MS	F	Sig.	Partial Eta Squared
Destination type	2.250	1	2.250	5.160	0.024	0.017
Advertising format	30.831	2	15.416	35.351	0.000	0.190
Destination * format	2.805	2	1.402	3.216	0.041	0.021
Error	131.259	301	0.436			
Total	4055.750	307				
Corrected Total	167.945	306				

Table 6 ANOVA results for consumers' utilitarianism

	SS	df	MS	F	Sig.	Partial Eta Squared
Destination type	0.318	1	0.318	1.015	0.315	0.003
Advertising format	6.109	2	3.055	9.743	0.000	0.061
Destination * format	4.905	2	2.452	7.822	0.000	0.049
Error	94.371	301	0.314			
Total	4753.750	307				
Corrected Total	106.094	306				

Table 7 ANOVA results for consumers' interest

	SS	df	MS	F	Sig.	Partial Eta Squared
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Destination type	0.015	1	0.015	0.047	0.828	0.000
Advertising format	1.567	2	0.784	2.463	0.087	0.016
Destination * format	0.599	2	0.300	0.942	0.391	0.006
Error	95.783	301	0.318			
Total	4934.250	307				
Corrected Total	97.956	306				

Table 8 ANOVA results for consumers' desire

	SS	df	MS	F	Sig.	Partial Eta Squared
Destination type	2.407	1	2.407	4.946	0.027	0.016
Advertising format	4.595	2	2.297	4.722	0.010	0.030
Destination * format	3.408	2	1.704	3.502	0.031	0.023
Error	146.448	301	0.487			
Total	4364.250	307				
Corrected Total	156.979	306				

Table 9 ANOVA results for consumers' credibility

	SS	df	MS	F	Sig.	Partial Eta Squared
Destination type	3.226	1	3.226	8.173	0.005	0.026
Advertising format	7.698	2	3.849	9.751	0.000	0.061
Destination * format	2.819	2	1.409	3.571	0.029	0.023
Error	118.818	301	0.395			
Total	4726.250	307				
Corrected Total	132.907	306				

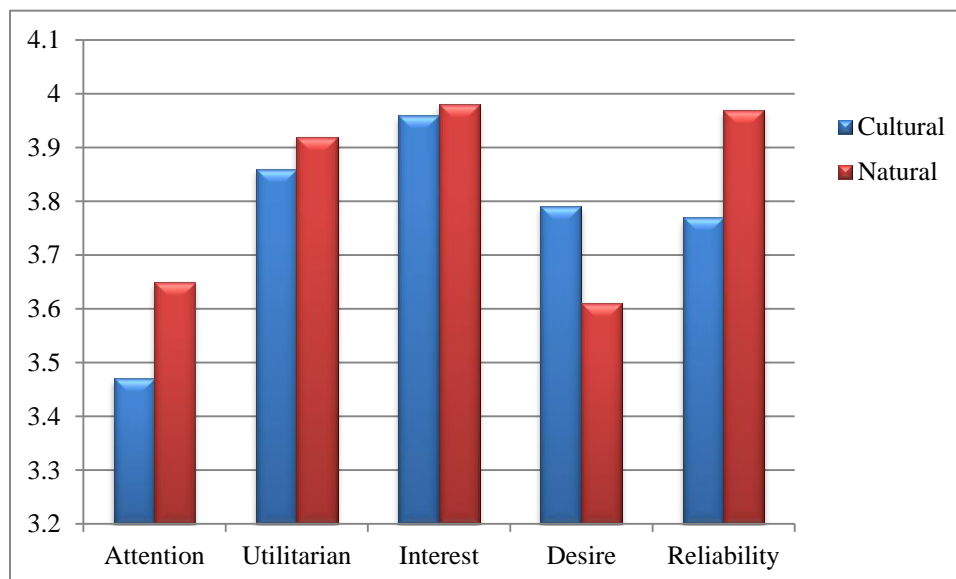


Fig.4. Participants' response to the ads of cultural and natural destination

4.4.2 Main effect of advertising format

The analysis uncovered a significant main effect of advertising format on participants' responses to tourism advertisements when measuring attention ($F_{(2,301)}=35.351$, $p<0.001$),

utilitarianism ($F_{(2,301)}=9.743$, $p<0.001$), desire ($F_{(2,301)}=4.722$, $p = 0.010$) and credibility ($F_{(2,301)}=9.751$, $p<0.001$), but not on interest ($F_{(2,301)}=2.463$, $p = 0.087$) (Tables 5–9). Thus, advertising format does not significantly influence viewers’ interests to know more information and see more about the destination. Due to three advertising formats were used in this study, post hoc analysis was adopted to further identify the differences between three formats. A Bonferroni adjustment at alpha was used in the post hoc analysis as suggested by Wang, Kirillova, and Lehto (2017). The post hoc analysis result is presented in Table 10. Several major findings can be summarized from the analyses in this section. First, generally speaking, print is the least effective advertising format comparing with VR and video. Second, advertising effects as reported by viewers do not differ significantly between VR and video. It suggests that VR has similar influences with video on advertising effects.

Table 10 Bonferroni comparison of three advertising formats

Dependent variables		VR vs video	VR vs print	Video vs print
Attention	Mean Diff.	0.187	0.761*	0.574*
	SE	0.092	0.925	0.929
	Sig.	0.126	0.000	0.000
Utilitarianism	Mean Diff.	0.058	0.337*	0.279*
	SE	0.078	0.078	0.079
	Sig.	1.000	0.000	0.001
Desire	Mean Diff.	-0.264	-0.012	0.253
	SE	0.097	0.098	0.098
	Sig.	0.020	1.000	0.032
Credibility	Mean Diff.	0.179	0.401*	0.222
	SE	0.087	0.088	0.088
	Sig.	0.124	0.000	0.038

Note: * <0.017

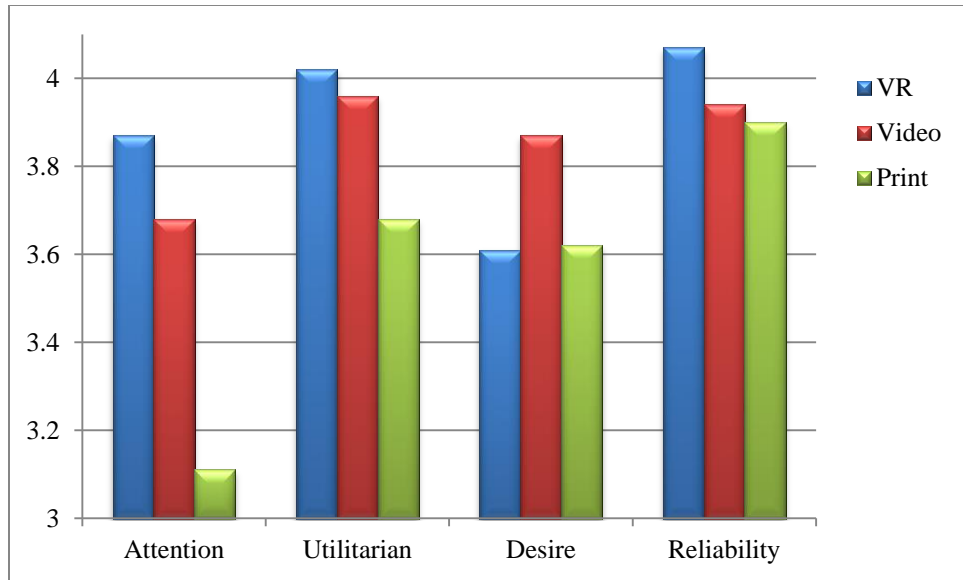


Fig.5. Participants' response to the ads in the three advertising formats

4.4.3 Interaction effect

The findings indicated significant interaction effects between destination type and advertising format on participants' attention ($F_{(2,301)}=3.216$, $p=0.041$), utilitarianism ($F_{(2,301)}=7.822$, $p<0.001$), desire ($F_{(2,301)}=3.502$, $p=0.031$) and credibility ($F_{(2,301)}=3.571$, $p=0.029$), but not on interest ($F_{(2,301)}=0.942$, $p=0.391$). Similarly, Bonferroni comparisons were used to examine the differences of the three advertising formats between cultural and natural destinations, as shown in Table 11 and Figures 6-9.

For the world cultural heritage site, it seems that in general the print advertisement is the least effective among the three advertising formats, particularly on attracting attentions, as well as providing helpful and trustworthy information. While participants paid significantly different attentions to VR ads in three formats for world cultural heritage site ($M_{VR}=3.91 > M_{video}=3.58 > M_{print}=2.92$), their desires for traveling to this destination do not differ between three ads formats. In addition, advertising effects reported by viewers are similar between VR ad and video ad, except for attention. This finding indicates that for the world cultural heritage site, VR

and video have similar influences on advertising effects, but print is not an effective advertising format.

The similar influence on advertising effects between VR and video is also observed in the results for the world natural heritage site. A close look at the Bonferroni comparison results induces more detailed findings. First, participants were less desired for the natural heritage site after watching its VR ads than watching the video ads ($M_{VR}=3.38 < M_{video}=3.82$). This finding confirms the concern from tourism industry that VR usage in destination marketing may backfire and the prior “try out and immersive” experience may easily lead to the decision of “no need to travel there”. Second, the majority of comparisons between three advertising formats for world cultural heritage sites are not significant, except that print ads attracts less attentions than VR and video ads and that the video ads leads to more desires for the visitation that the VR ads. To sum, the above two major findings suggest that video is the most effective advertising format for natural destination comparing with VR and print.

Table 11 Bonferroni comparison of three advertising formats between cultural and natural destination

Dependent variables		Cultural destination			Natural destination		
		VR vs video	VR vs print	Video vs print	VR vs video	VR vs print	Video vs print
Attention	Mean Diff.	0.329*	0.983*	0.654*	0.043	0.518*	0.476*
	SE	0.130	0.130	0.130	0.129	0.132	1.328
	Sig.	0.012	0.000	0.000	1.000	0.000	0.001
Utilitarianism	Mean Diff.	0.161	0.632*	0.471*	-0.047	0.020	0.067
	SE	0.115	0.115	0.115	0.104	0.107	0.107
	Sig.	0.486	0.000	0.000	1.000	1.000	1.000
Desire	Mean Diff.	-0.084	0.234	0.317	-0.449*	-0.263	0.185
	SE	0.137	0.137	0.138	0.136	0.139	0.139
	Sig.	1.000	0.272	0.068	0.004	0.181	0.561
Credibility	Mean Diff.	0.230	0.615*	0.385*	0.126	0.163	0.037
	SE	0.117	0.117	0.118	0.129	0.132	0.133
	Sig.	0.156	0.000	0.004	0.991	0.655	1.000

Note: * <0.017

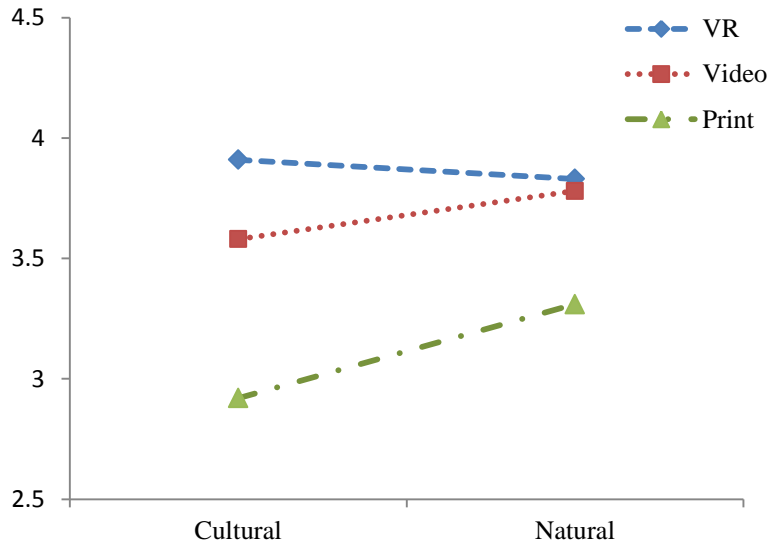


Fig.6. Interaction effects on consumers' attention towards tourism advertisements

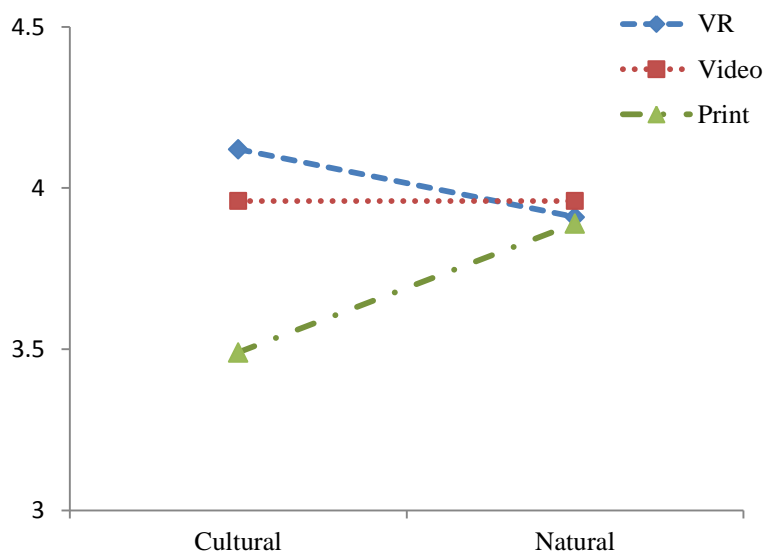


Fig.7. Interaction effects on consumers' utilitarianism towards tourism advertisements

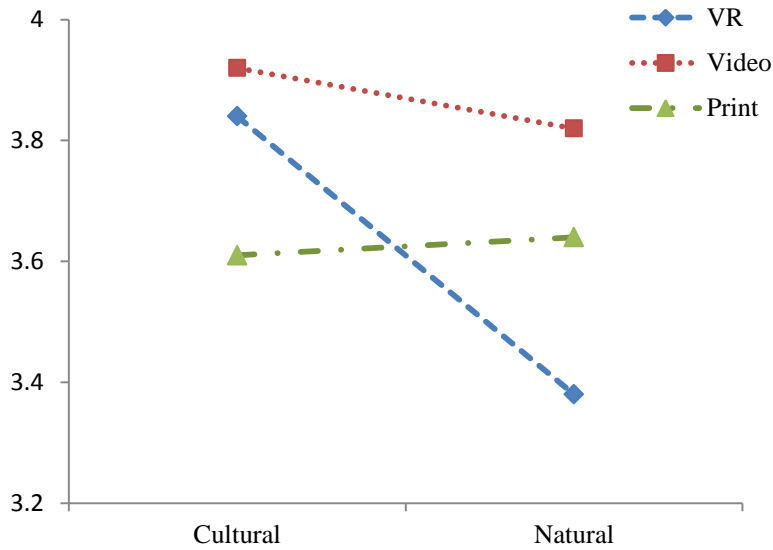


Fig.8. Interaction effects on consumers' desire towards tourism advertisements

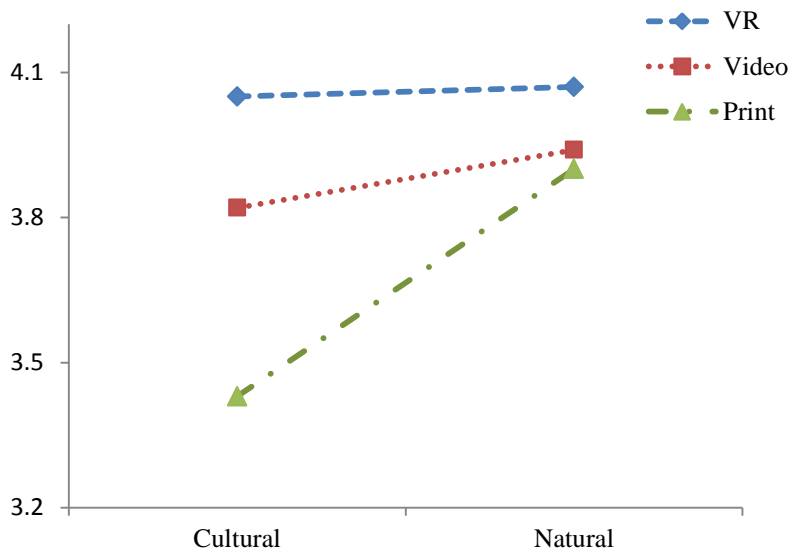


Fig.9. Interaction effects on consumers' credibility towards tourism advertisements

5. Conclusion and discussion

This study developed the AUIDCA framework for tourism advertising effects and empirically examined this framework in an experiment. The AUIDCA framework for tourism advertising effects was first proposed to measure consumers' responses to tourism advertisements with six variables in hierarchy: Attention, Interest, Utilitarianism, Desire, Credibility, and Action. The AUIDC framework, excluding Action due to the measurement

difficulty, Action is excluded was then empirically tested and verified. Finally, the AUIDC framework was examined on destination types and advertising formats in a 2 (destination type: cultural vs. natural) × 3 (advertising format: print vs. video vs. VR) between-subject experiment.

Several major findings are uncovered in this study. First, comparing with cultural destination advertisements, advertisements of the natural site tend to receive more attention and credibility from participants but the cultural destination is desired more by consumers after watching the ads. Second, VR ads tend to be more effective than print ads on attention, utilitarianism and credibility, and video ads receive more attention and utilitarianism than print ads as reported by the participants. Third, it is worth noting that although consumers can be attracted by VR technology, but their desires to travel to the cultural destination are not strong. These findings indicate that the physical immersion and psychological presence that VR offers may have the backfire effect. The possible reasons could be that VR has the ability to simulate real-life situations and contexts (Diemer et al., 2015, which has been considered as a substitute to actual travel (Sussmann & Vanhegan, 2000)). In addition, for natural destination, VR ads did not have significant differences with video ads and the desire was even lower for VR ads than video ads, which indicates that video might be superior for natural destination than VR technology.

5.1 Theoretical implications

The present study has several significant theoretical contributions to the existing literature. First, this study is among the first in tourism research that acknowledges and employed the three hierarchical stages of consumers' responses to tourism advertisements. Previous studies have examined tourism advertising effects by different variables that were selected arbitrarily without a sound reasoning (e.g., Byun & Jang, 2015; Li, Huang, & Christianian, 2016). These variables only involve one or two stages of the hierarchical model, such as behavioral or cognitive aspects,

lacking a structured framework of tourism advertising effects (McWilliams & Crompton, 1997). Recognizing the omission of this important issue in tourism research, the present study proposed and empirically tested the AUIDC framework of tourism advertising effects with five variables: Attention, Utilitarianism, Interest, Desire, and Credibility. The robustness of this structured framework has been validated in this study. This finding thus significantly enriches the tourism literature and provides a more thorough understanding of consumer decision making process. It is believed that this framework could be applied as dependent variables to examine consumers' response towards tourism advertisements in tourism settings.

Second, the present study extends the line of research on tourism advertising effects and advertising formats by including VR ads. VR is believed to offer an immersive experience and sense of being to potential tourists (Tussyadiah et al., 2018). It has been used in some destination marketing practices while academic community hasn't paid enough attentions to this new ads format. Existing studies have mainly focused on assessing the advertising effectiveness of massive and unidimensional advertising formats, such as television, radio and magazine, but ignored the interactive and multidimensional advertising format (Dahlén & Edenius, 2007; Kim, Hwang, & Fesenmaier, 2005). This study fills this research gap by including VR in the examination of tourism advertising effects. The findings indicate that VR may have the backfire effect when employing it in tourism marketing. For instance, this study indicates that VR can undoubtedly gain consumers' attention, but can't promote consumers' desire of actual travel to world cultural heritage site. If VR could provide consumers a simulated and immersive experience which would satisfy what they need, then they may think there is no need to travel to destination again. This finding indirectly supports the argument that simulated experience could be a substitute to actual travel (Cheong, 1995; Sussmann & Vanhegan, 2000).

Furthermore, this study proposed and tested the interaction effects of advertising formats and destination types on tourism advertising effects. The vast majority of existing studies examined consumers' response towards tourism advertisements of different destinations or in different advertising formats respectively (Byun & Jang, 2015; Dahlén & Edenius, 2007; Kim, Hwang & Fesenmaier, 2005; Wan et al., 2007). The present study combines the two variables and argued that advertising formats may moderate the effect of destination types on consumers' response towards tourism advertisements. Findings of this study indicate that different advertising formats have their own strengths and weaknesses in delivering advertisement information of different destinations. Even though VR can offer interactive experience, it's not always better than traditional advertising formats such as video and print (Bezjian-Avery, Calder, & Iacobucci, 1998; Wan et al., 2007). For world natural heritage site, VR is even less effective. The interaction effects of advertising formats and destination types could provide more practical implications for tourism industry.

5.2 Managerial implications

Findings of the present study provide several important practical implications to tourism marketing. First, this study indicates that utilitarianism and credibility are very important elements to measure tourism advertising effects. It is known to all that tourism products are intangible, consumers can't have a trial in advance and have to decide whether or not to purchase based simply on available descriptive information (Gratzer, Werthner, & Winiwarter, 2004; Guttentag, 2010; Litvin, Goldsmith, & Pan, 2008), thus the perceived credibility and utilitarianism are crucial for evaluating the tourism ads (Brackett & Carr, 2001; Fishbein & Ajzen, 1975; Loda, Norman, & Backman, 2005). Hence, to design effective tourism advertisements, marketing managers should not only concentrate on attracting attention,

maintaining interest, creating desire (Strong, 1925), but also need to pay attention to the utilitarianism and credibility of the advertising information. Thus, consumers tend to trust the ads information which may result in more purchase intention (Loda, Norman, & Backman, 2005; Smith & Vogt, 1995).

Second, findings of this study caution destination marketers to employ the appropriate advertising formats with considerations of other factors such as the destination type, preferences of target markets, etc. Advertisements with the most advanced techniques may not be the most effective ads. Every medium has its own way of presenting information (Kim, Hwang & Fesenmaier, 2005). Marketing managers should understand the attributes of each medium and what characteristics the destinations represent so that they can utilize the appropriate advertising formats to design effective advertisements for the destinations (Byun & Jang, 2015). For example, this study indicated there were no significant differences between consumers' response towards the advertisement of world natural heritage site when VR and video employed, which means that video may have the same advertising effectiveness as VR. Thus, for world natural heritage site, it might not be necessary to make VR ads at high cost. Therefore, choosing a suitable advertising format according to the destination characteristics, budget and promoted targets rather than employing new advertising formats at random will be a more effective strategy for marketing managers in the tourism industry.

Finally, it can be concluded that VR is a double-edged sword for certain destination, marketing managers should be aware of the backfire effects of VR. It is precisely because VR can offer consumers immersive and simulated experience, which would satisfy consumers' needs and then they may not travel to the real destination (Sussmann & Vanhegan, 2000; Tussyadiah et al., 2018). In particular, for world cultural heritage site, marketing managers need to explicitly

understand their management objectives when employing the VR technology. If the aim is to limit the number of tourists in order to protect the cultural relics, then apply VR is appropriate. Consumers can appreciate the cultural relics through VR and even be able to experience what they can't do in the field. If the aim is to attract more tourists to travel to the cultural heritage site, however, then VR technology may be not suitable. If blindly selected, it is likely to backfire.

5.3 Limitations and future research

It should be noted that the present study is not without limitations. First, the participants in this study were young generation between 18-35 years old, thus the results reported in this study might have potentially biases and need to be interpreted with caution. Future studies are encouraged to include middle aged and elderly people and then compare the results between the young and the old, some interesting findings may be concluded. Second, this study employed VR Box as the output devices, which are headsets that work on the basis of using a mobile device as a display. This may present a limitation due to the mobile devices processing power and limited ability to process immersive experience (Tussyadiah et al., 2018). It is suggested that future research use VR output devices that can offer more immersive 3D content, such as AR goggles, HMDs, or CAVEs, etc. to investigate the comparative response to the tourism advertisements (Guttentag, 2010). Lastly, this study only selected two types of destinations (cultural vs. natural) to conduct the experiment, future studies are invited to select additional destinations (e.g., museum or manmade attractions) to verify the results of this study.

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