

The effect of information presentation modes on tourists' responses in Internet marketing: the moderating role of emotions

Ching-Hsuan Yeh, Yi-Shun Wang, Hsien-Ta Li & Shuo-Yan Lin


To cite this article: Ching-Hsuan Yeh, Yi-Shun Wang, Hsien-Ta Li & Shuo-Yan Lin (2017): The effect of information presentation modes on tourists' responses in Internet marketing: the moderating role of emotions, *Journal of Travel & Tourism Marketing*, DOI: [10.1080/10548408.2016.1276509](https://doi.org/10.1080/10548408.2016.1276509)

To link to this article: <http://dx.doi.org/10.1080/10548408.2016.1276509>



Published online: 24 Jan 2017.



[Submit your article to this journal](#) 



Article views: 11



[View related articles](#) 



[View Crossmark data](#) 

The effect of information presentation modes on tourists' responses in Internet marketing: the moderating role of emotions

Ching-Hsuan Yeh^a, Yi-Shun Wang^a, Hsien-Ta Li^b and Shuo-Yan Lin^a

^aDepartment of Information Management, National Changhua University of Education, No. 2, Shi-da Road, Changhua 500, Taiwan;

^bDepartment of Business Administration, National Cheng Kung University, No.1, University Road, Tainan City 701, Taiwan

ABSTRACT

In order to enhance our understanding of the effectiveness of information transmission through virtual reality (VR), this study used a modified stimulus–organism–response framework to examine the relationships between information presentation modes (VR versus picture), emotions (pleasure and arousal), and tourists' responses, namely attention, interest, desire, and action (AIDA) in the context of Internet tourism marketing. Multivariate analysis of variance (MANOVA) and multivariate analysis of covariance (MANCOVA) were employed to analyze data gathered from 184 respondents participating in a factorial experimental design. The results indicated that compared with the picture mode, the VR mode had superior effects on tourists' responses, but these superior effects were moderated by arousal. High-arousal tourists had stronger AIDA responses in the VR mode than in the picture mode. However, the stronger effects of the VR mode on tourists' AIDA responses disappeared in the low-arousal group. The findings of this study provide several important theoretical and practical implications for Internet tourism marketing.

ARTICLE HISTORY

Received 22 July 2016

Revised 5 November 2016

Accepted 20 December 2016

KEYWORDS

Virtual reality (VR);
information presentation;
emotions; tourists' response;
Internet marketing

Introduction

The continuous advancement of information technologies has meant that the presentation of online products has been diversifying and evolving. One notable innovative technology is virtual reality (VR), which generates three-dimensional images in a computer environment. It is believed that VR conveys a sense of telepresence in terms of vividness and interactivity, and the medium communicates rich product information (Biocca, 1992) and enjoyment (Lee & Chung, 2008) to consumers. Because of these apparent advantages, VR is generally perceived to increase consumers' product evaluations and purchase intentions (Mollen & Wilson, 2010; Steuer, 1992), compared with picture presentations (Jiang & Benbasat, 2007; Li, Daugherty, & Biocca, 2002).

However, results of some recent studies have contradicted the findings that support the advantages of VR. For example, Li, Daugherty, and Biocca (2003) and Debbabi, Daassi, and Baile (2010) found that there was no significant difference between VR and picture advertisements in the effect on consumer evaluations of products (e.g. bedding and coats) when consumers deemed the information about the product's physical materials as very valuable. Similarly, Williams (2014)

reported that no significant difference was found in the sense of presence and enjoyment between three-dimensional and two-dimensional video games. These results indicate that VR may not always outperform the use of pictures. Clearly, these contradictory results reveal an urgent need for additional research that can clarify the effects of the information presentation mode (VR versus picture) on consumer responses to advertisements. The current study was motivated by a desire to generate data to help resolve this contradiction was designed to achieve this.

For this study, the authors adapted the stimulus–organism–response framework (SOR) from environmental psychology as the theoretical foundation (Mehrabian & Russell, 1974). Marketing studies have used the SOR framework to explain how store stimuli like music and light affect consumers' emotional states and their purchase behaviors (Donovan, Rossiter, Marcoolyn, & Nesdale, 1994). A key assumption of this usage is that the consumers' emotional states are directly influenced by the store stimuli. However, the findings of recent studies have challenged this assumption. Using interview data, Hynes and Manson (2016) showed that the music within a service scape may fail to influence shoppers' emotions. Jin (2009) contended that the media

effectiveness is a joint consideration of media characteristics and consumer characteristics. While facing the same media characteristics (richness), consumers who vary in involvement (high and low) show different responses in product attitude, purchase intentions, and online shopping enjoyment. Grohmann, Spangenberg, and Sprott (2007) stated that stores that allow consumers to acquire information via touch (stimulus) have a better ability to influence consumers' product evaluations, and individual differences (need for touch) moderated the stimuli–response relationship – the mediating role of affect did not exist. Leenders, Smidts, and El Haji (in press) reported that personal characteristics (age and gender) might moderate the relationship of ambient scent and mood/affect in supermarkets, indicating that the stimuli–organism relationship is individual-specific. A close look at their results suggests that consumers' emotions are not necessarily mediators but may be individual difference variables that moderate the relationship between store stimuli and consumer response. Therefore, the current authors argue that a person's emotions may vary with the store stimuli (Desmet, 2010). By specifying emotions as moderators, the authors investigate how emotions influence the relationship between presentation mode and consumer response.

In order to test consumer responses to VR and picture modes, the authors selected the online tourism marketing context because VR has been increasingly deployed there. Tourism is an information-intensive industry, which means that tourists usually rely on information about an attraction before making a travel decision (Beerli & Martín, 2004; Gratzner, Werthner, & Winiwarter, 2004). A trial of the local attraction prior to the actual visit is not feasible (Cho, Wang, & Fesenmaier, 2002). Therefore, to generate a favorable perception amongst potential consumers, tourist marketers generally devote a lot of resources to delivering attractive information, such as enhanced quality pictures, positive word-of-mouth, and so on. New presentation techniques such as VR, which increase consumers' vicarious experiences, have been widely adopted (Cheong, 1995; Guttentag, 2010). The current study compares the effectiveness of different presentation modes (VR versus pictures) using a modified SOR framework. The results of this research provide some important theoretical and practical implications for Internet tourism marketing management.

Before describing the experimental design and methods, the authors first review the existing literature and outline the theoretical background, including the sequential elaboration of the three elements of the SOR framework. Information presentation modes (VR versus

pictures) are environmental stimuli, while human responses to environmental stimuli are evoked attention, interest, desire, and action. Emotions are described by two dimensions: pleasure and arousal. Based on this review, the authors propose several hypotheses. Following the methods section, the authors report the results analysis. Finally, they discuss the theoretical and practical implications as well as the limitations of this study.

Theoretical background

Information presentation modes: VR and telepresence theory

Product experience is the substantive information source that consumers often use for product evaluations. Consumers' direct product experiences are a better determinant of product preferences than indirect experiences derived from visual and verbal messages (Hamilton & Thompson, 2007). The information gained from direct experience is more concrete and credible, and it strengthens confidence and lessens uncertainty of consumers' purchase decisions. As such, e-marketers have striven to create direct experience equivalence using computer-mediated contexts. The VR presentation mode shows products in three dimensions, which gives the products more verisimilitude and provides consumers with a greater sense of telepresence. Telepresence is an individual's psychological state of being in an artificial world (Mollen & Wilson, 2010). Telepresence for consumers refers to the perception of a mediated world being non-mediated (Nah, Eschenbrenner, & DeWester, 2011), creating a virtual product experience (Coyle & Thorson, 2001; Klein, 2003).

Two factors, vividness and interactivity, contribute to an individual's sense of telepresence (Fortin & Dholakia, 2005; Steuer, 1992). Vividness refers to the multiplicity (i.e. sensory breadth) and quality (i.e. sensory depth) of information (Hoffman & Novak, 1996; Klein, 2003), and it is conceptually equivalent to media richness (Li et al., 2002). A presentation mode with high vividness facilitates consumers' comprehension of product information and can make them feel as if they were in the physical store (Griffith & Gray, 2002; Kahai & Cooper, 2003). Interactivity indicates the extent to which consumers can freely control the elements and information in a mediated environment (Lombard & Snyder-Duch, 2001). Steuer (1992) reported that interactivity is determined by speed (i.e. feedback time), range (i.e. the number of manageable objects), and mapping (i.e. the extent to which the object moves as expected). A presentation mode with high interactivity leads consumers

to perceive themselves as active actors/players rather than passive spectators (Kim & Biocca, 1997).

Different presentation modes, such as VR and pictures, vary in vividness and interactivity. Generally, it is believed that VR provides consumers with a highly vivid and interactive experience, and thus has a greater telepresence than pictures (Fortin & Dholakia, 2005; Hamilton & Thompson, 2007; Li, Daugherty, & Biocca, 2001). Accordingly, the high perceived telepresence of VR should increase consumers' beliefs about the product's attributes, enjoyableness, brand equity, and the consumers' own attitudes and purchase intentions (Debbabi et al., 2010; Klein, 2003; Li et al., 2002; Nah et al., 2011). However, as mentioned earlier, recent studies, such as those by Debbabi et al. (2010), Li et al. (2003), and Williams (2014), have questioned the superiority of VR over pictures. More empirical comparisons of the two information presentation modes are needed.

VR technology has been widely adopted in the tourism industry in various contexts. As Guttentag (2010) noted, VR might be beneficial for tourism planners to communicate their plans to audiences and stakeholders, and it may serve as a valuable tool for accessibility and heritage preservation. A common VR application is the marketing of tourist destinations, such as hotels, theme parks, museums, and so on (Doolin, Burgess, & Cooper, 2002; Tang, Jang, & Morrison, 2012; Tsai, Chou, & Lai, 2010). The verisimilitude of the VR medium can provide tourists with vicarious experiences and rich information that can help aid decisions about their trip (Buhalis & Law, 2008). For example, Jacob, Guéguen, and Petr (2010) found evidence that tourists who take a VR tour might gain a better understanding of the destination. The information presented in a VR tour is realistic, so tourists are more confident about forming reasonable expectations (Cho et al., 2002), and they have better tour satisfaction (Cheong, 1995).

Emotions: SOR framework and cognitive appraisal theory

In the field of marketing, emotions are generally defined as a consumer's subjective feelings that occur during the consumption process, which includes product presentation, purchase, and use (Ruth, Brunel, & Otnes, 2002). Previous studies of consumer emotions fall within one of two main research streams. One stream focuses on emotion typology, which classifies emotions into specific categories, like anger, joy, fear, love, and happiness (Richins, 1997; Ruth et al., 2002), or into more general groups such as positive and negative (Watson, Wiese,

Vaidya, & Tellegen, 1999). Watson and Spence (2007) called the specific emotion typology a categorical approach and the general emotions typology a dimensional approach. A hierarchy of consumer emotions may reconcile these two approaches. General emotions are superordinate categories (Mervis & Rosch, 1981), while specific emotions are subordinate and can be grouped into one of the general categories. Therefore, emotions within the same general category should share a similar essence. For instance, positive emotions might include contentment, happiness, love, and pride, while negative emotions might consist of anger, fear, sadness, and shame (Laros & Steenkamp, 2005).

Pleasure–arousal–dominance (PAD) is another dimensional approach with three dimensions: pleasure–displeasure, arousal–non-arousal, and dominance–submissiveness (Mehrabian & Russell, 1974; Ruth et al., 2002). The three dimensions in the PAD framework are independent and bipolar. Pleasure denotes the affective states of being good, happy, pleased, or joyful; it ranges from ecstasy to pain. Arousal indicates the extent to which an individual feels stimulated, excited, alert, or active; it ranges from frenzied excitement to sleep. Dominance is the extent to which an individual feels controlling, influential, and autonomous; it ranges from feeling in control of a situation to feeling a lack of control (Andersson, Kristensson, Wästlund, & Gustafsson, 2012; Mazaheri, Richard, & Laroche, 2011; Menon & Kahn, 2002). As a dimensional approach, the PAD framework is able to differentiate specific emotions. For instance, Russell and Mehrabian (1974) utilized these three dimensions to distinguish anger from anxiety. Both anger and anxiety consist of feelings of displeasure and high arousal. However, anger and anxiety involve dominance and submissiveness respectively.

The second main consumer emotion research stream investigates the causes and consequences of emotions. Previous studies have focused on the role of emotion in the store environment in terms of the SOR framework (Bagozzi, Gopinath, & Nyer, 1999). That is, consumer emotions elicited by environmental and marketing stimuli determine consumers' subsequent shopping behaviors. If consumers favorably perceive store stimuli, their positive emotions might intensify their store-visiting and purchase behaviors (Walsh, Shiu, Hassan, Michaelidou, & Beatty, 2011). For example, Hul, Dube, and Chebat (1997) found that consumers in a bank that broadcasts positive valence music felt less frustration, irritation, and dissatisfaction, behaved in a more approachable way, recommended the bank to friend, and they were also more loyal compared with

consumers of a bank broadcasting negative valence music. Following the SOR framework, consumer emotions are interpreted as mediators between the stimuli and the response .

Anchored to the SOR framework, cognitive appraisal theory argues that emotions are the result of consumer assessments of the store environment (Lazarus, 1991). The SOR framework explains how emotions are affected by stimuli and affect behaviors in a sequential chain. Cognitive appraisal theory further contends that every consumer is “an active agent in the construction of meaning” (Elliott, 1997, p. 285), and consumer emotions may vary when exposed to the same environmental stimuli. This is similar to Adelaar, Chang, Lancendorfer, Lee, and Morimoto’s (2003) contention that personality may moderate the relationship between environmental stimuli and emotions. Therefore, the current authors specified emotion as a moderator rather than a mediator, and they investigated how emotions bias the relationship between presentation modes (VR versus pictures) and consumer responses (cf. Bagozzi et al., 1999; Kuppens, 2008; Lazarus, 1991; Tang et al., 2012).

Consumer responses: AIDA model

Consumer responses are often used to evaluate how effective a presentation mode is. Strong Jr.’s (1925) AIDA model, which investigated advertisement effectiveness in terms of consumers’ attention, interest, desire, and action, remains popular in advertising research. An effective presentation mode is expected to attract consumers’ attention, maintain their interest, create desire, and result in some action (Kotler, Ang, Leong, & Tan, 2003). The AIDA model has been utilized to analyze various advertising phenomena, such as the effectiveness of TV advertisements promoting electricity conservation (Ranjbarian, Shaemi, & Ebrahimian Jolodar, 2011) and using celebrity athlete endorsers (Schaefer, Parker, & Haytko, 2011). As for tourists taking photographs of a destination and sharing them online, the AIDA model has been utilized to evaluate the unintended promotional effects on that destination (Lin & Huang, 2006).

For the current study, the authors followed the above line of thought and used AIDA to evaluate tourists’ responses. However, although they employed the AIDA model, their focus remained on the four responses rather than the sequence of the responses (see Huey, 1999).

Research model and hypotheses

The model of hypothesized relationships between information presentation modes (VR versus picture) and consumers’ AIDA responses and emotion (PAD framework) as a moderator is illustrated in Figure 1. Emotion was measured using the pleasure and arousal dimensions because these two dimensions explain most of the emotional variance; the explanatory power of dominance is trivial (Russell & Mehrabian, 1976). Many studies have adopted the modified bi-dimensional typology (Andersson et al., 2012; Desmet, 2010; Russell & Pratt, 1980), and the pleasure–arousal framework has been applied to analyze consumer emotions in many different contexts, such as in-store, out-of-store, and online environments. For instance, in Walsh et al.’s (2011) study of in-store atmospherics, they found that pleasure and arousal mediated the relationship of consumer perceptions of in-store music and customer loyalty. In the out-of-store environment, Yüksel (2007) found evidence of a direct positive relationship between environmental perceptions of the shopping location and pleasure/arousal. The study found that pleasure/arousal was positively related to approach responses, including revisit intentions and the tendency to spend more money and time than originally planned. Furthermore, Menon and Kahn (2002) found that high pleasure or arousal evoked in an initial Internet consumption situation led to approach behaviors in subsequent similar situations (i.e. carry-over effects), such as being more likely to browse additional product categories.

Jiang and Benbasat (2007) reported that product presentations in a virtual-product-experience format led to higher perceived website diagnosticity than that in a static-picture format. Li et al. (2002) found that compared with two-dimensional advertising, three-dimensional advertising generated a greater sense of telepresence, greater product knowledge, and more favorable brand attitudes. Suh and Lee (2005) found that compared with static interfaces, VR interfaces had superior effects on consumers’ actual product knowledge, perceived product knowledge,

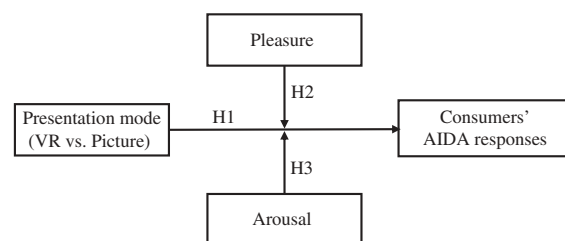


Figure 1. Research model.

attitude toward the product, and purchase intentions. Furthermore, Nah et al. (2011) found that three-dimensional virtual environments lead to higher telepresence, and a higher level of user enjoyment than two-dimensional virtual environments.

In the context of tourism marketing, studies on virtual tours have found statistical evidence for the effect of VR (Huang, Backman, Backman, & Moore, 2013; Lee & Oh, 2007; Skadberg & Kimmel, 2004). Wan, Tsaur, Chiu, and Chiou (2007) compared the differences in advertisement attitude, brand image, and purchase intentions of two presentation modes (virtual experience versus brochure) in the advertisements for a theme park and a nature park. They found that the virtual advertisement mode outperformed the brochure mode for the theme park. Thus, the authors of the current study have attempted to compare the difference between VR and picture modes in an Internet tourism marketing context in consumers' AIDA. Drawing on the aforementioned empirical findings and reasoning, the authors hypothesize that compared with picture mode, promotional information presented in VR mode should result in better consumer AIDA responses. The following hypotheses (Hs) state the predicted relationships.

H1a: The VR mode generates more consumer attention than the picture mode in the Internet tourism marketing context.

H1b: The VR mode generates more consumer interest than the picture mode in the Internet tourism marketing context.

H1c: The VR mode generates more consumer desire than the picture mode in the Internet tourism marketing context.

H1d: The VR mode generates more consumer action than the picture mode in the Internet tourism marketing context.

In tourism studies that explored tourist emotions, researchers often regarded emotion as a mediator, which is in line with the SOR framework. Huang et al. (2013) found evidence that when people take a virtual tour, positive emotions mediate the relationship between media characteristics (i.e. perceived ease of use and perceived usefulness) and behavioral intentions. Hyun and O'Keefe (2012) reported that virtual travel information derived from a web-mediated environment delivers greater telepresence compared with offline travel information, and it functioned in a

telepresence–cognition–affection–conation mechanism. Tourists' emotions were affected by perceived virtual travel information, which contributed to their intent to book online and purchase travel packages.

However, emotions may also act as a moderator. According to Isen (1987), individuals experiencing high pleasure/arousal have a better ability to successfully deal with information load and complexity, and thus are more aware of stimuli. This awareness may then facilitate confidence in decision-making and risk-taking (Menon & Kahn, 2002). Investigating the moderating effects of emotional expressivity, which refers to the behavioral changes (e.g. facial expression or posture) accompanying emotion, Luong (2005) revealed that consumers with higher emotional expressivity show more positive responses after watching a service provider's friendly display than consumers with lower emotional expressivity. de Rojas and Camarero's (2008) study found that museum visitors' initial positive mood strengthened the effects of perceived service quality and disconfirmation on satisfaction. Thus, the authors of the current study predict that when consumers experience high pleasure or arousal, the superior effects of the VR mode on consumer AIDA responses are augmented. The following hypotheses state the predicted relationships:

H2: The effects of presentation modes on consumer AIDA responses are positively moderated by pleasure.

H3: The effects of presentation modes on consumer AIDA responses are positively moderated by arousal.

Methods

Experimental design

The proposed hypotheses were tested under the scenario of consumers visiting a simulated destination website. This website was developed to promote a one-day tour in Tamsui, a small town in northern Taiwan, of several well-known historical and cultural sites. There were six popular attractions packaged in the tour, and each attraction was shown on a single webpage. Two versions of the website (i.e. VR and picture) were manipulated to examine the effects of the information presentation mode. For each version, all attractions were presented using the same mode. However, all elements of the web design, such as layout, brightness, color, and content (e.g. attraction interpretation) were identical in the two versions. No audio information was offered in either mode.

A convenience sample was recruited by posting invitations to take part in the survey on social networking sites and bulletin board systems for two-and-a-half months. A factorial experimental design was employed: participants were randomly assigned to one of the two versions of the website, and they were instructed to browse all six attractions in the order they were shown. Once participants had browsed all six pages, they responded to several online questions to capture their demographics, emotion (pleasure and arousal), and AIDA responses. A total of 184 responses were collected, of which 93 were from the VR version.

As shown in Table 1, the homogeneity test showed no significant difference in gender of the VR and picture groups. The results of a *t*-test showed that the

Table 1. Demographics and homogeneity tests.

	VR (N = 93)	Picture (N = 91)	Test statistics ^a
Gender			$\chi^2 = 0.19$
Male	51	47	
Female	42	44	
Age	26.40	27.31	$t = -0.67$
Education ^b			$\chi^2 = 7.64^*$
Junior high school diploma or lower	2	4	
Senior high school diploma or equivalent	3	12	
Bachelor's or associate's degree	50	48	
Master's degree or higher	38	27	

^a* $p < 0.05$.

^bThe first two groups in each mode were combined for the homogeneity test due to an insufficient number of participants.

participants' age did not statistically vary between the two groups. Though educational level was significantly different, the majority of the participants in both groups were 30 years old and under, and had attained a bachelor's or associate's degree. As such, it was determined that comparisons of the two groups were still feasible.

Stimuli

The VR mode was image-based (Gledhill, Tian, Taylor, & Clarke, 2003). After capturing, stitching, reconstructing, and rendering the images, the scenes of an attraction were translated into a panorama view, presenting a 360-degree image of that attraction. Figure 2 is an example of a panorama image. It shows Fort San Domingo, a building initially constructed by the Spanish in the late 1620s. Participants took a virtual tour for each attraction. They were able to view the attraction in a 360 degree clockwise/counterclockwise fashion by positioning the cursor on the right-/left-hand side of the image. Participants could stop the image from scrolling by clicking it, and they could increase the scrolling speed by placing the cursor closer to the horizontal border. For the picture mode, vignettes of the chosen views were captured from the left part of the panorama images (Figure 3).



Figure 2. Three views at Fort San Domingo in the VR mode.



Figure 3. Three views at Fort San Domingo in the picture mode.

Table 2. Dimensionality and construct validity of emotions.

Dimensions and items	Standardized factor loadings ^a	AVE	Composite reliability	Cronbach's α
Pleasure		0.69	0.93	0.93
Unhappy-happy	0.82 (13.43)			
Annoyed-pleased	0.84 (13.74)			
Unsatisfied-satisfied	0.86 (14.26)			
Melancholic-contented	0.85 (14.19)			
Despairing-hopeful	0.81 (13.06)			
Bored-relaxed	0.79 (12.55)			
Arousal		0.77	0.93	0.93
Relaxed-stimulated	0.83 (13.59)			
Calm-excited	0.86 (14.37)			
Sluggish-frenzied ^b	–			
Dull-jittery	0.88 (14.82)			
Sleepy-wide awake	0.93 (16.54)			
Unaroused-aroused ^b	–			

^aThe numbers in parentheses are *t*-values.

^bThese items were removed due to cross-loading.

Measures

Measures of pleasure and arousal were adapted from Mehrabian and Russell (1974), Yüksel (2007), and Hyun, Kim, and Lee (2011). Both pleasure and arousal were measured by six pairs of bipolar adjectives on 7-point semantic differential scales (Table 2). The emotion measures were presented to participants using the following statement: “This website makes me feel ...”. Furthermore, inspired by Ranjbarian et al. (2011) and Schaefer et al.’s (2011) studies, a new scale of tourists’ AIDA responses was created. The four dimensions were measured using five, four, four, and four items respectively (Table 3). Each item was rated using a 7-point Likert scale.

Analytic procedure

The dimensionality, reliability, and validity of the measures were examined with several statistical

Table 3. Dimensionality and construct validity of AIDA responses.

Dimensions and items	Standardized factor loadings ^a	AVE	Composite reliability	Cronbach's α
Attention		0.72	0.93	0.93
The tour theme of the website attracts my attention.	0.87 (14.89)			
The layout of the website attracts my attention.	0.81 (13.32)			
The images on the website attract my attention.	0.85 (14.15)			
The reports on the website attract my attention.	0.84 (14.07)			
The tour itinerary on the website attracts my attention.	0.87 (14.79)			
Interest		0.75	0.92	0.92
The images on the website induce my interest to visit the place.	0.87 (14.75)			
The tour itinerary on the website induces my interest to visit the place.	0.89 (15.40)			
The reports on the website induce my interest to visit the place.	0.90 (15.69)			
I am more interested in the website that offers images.	0.81 (13.29)			
Desire		0.81	0.90	0.90
The travel information the website provides increases my desire to visit this place.	0.90 (15.37)			
The reports on the website increase my desire to visit this place.	0.90 (15.47)			
The snack information the website provides increases my desire to taste the food in this place ^b .	–			
The images of the attraction on the website increase my desire to visit this place ^b .	–			
Action		0.85	0.92	0.92
I will visit Tamsui when I am free.	0.95 (16.52)			
I will visit Tamsui with friends.	0.89 (14.90)			
I will visit the attractions the website recommends ^b .	–			
I will eat the snacks the website recommends ^b .	–			

^aThe numbers in parentheses are *t*-values.

^bThese items were removed due to cross-loading.

techniques. Confirmatory factor analysis was used to check the dimensionality of emotions and AIDA responses (Hair, Black, Babin, & Anderson, 2010). Composite reliability and Cronbach's α were adopted to examine reliability. Factor loadings and average variance extracted were used to assess convergent validity. Discriminant validity was evaluated in terms of Anderson and Gerbing's (1988) correlation criterion. If the statistical results meet the threshold values, the measurement validity and reliability are satisfied. Second, MANOVA and MANCOVA were conducted to examine the effects of presentation modes on AIDA responses (H1a–d) and the moderating effects of emotions on the linkage of presentation mode and AIDA responses (H2 and H3) separately. The tests of dimensionality, reliability (composite reliability and Cronbach's α), and convergent validity (factor loadings and average variance extracted) were done with the LISREL 8.8 software package. SAS software was used for the tests of discriminant validity, MANOVA, and MANCOVA.

Results

Measurement analysis

Emotions

The measures for the two emotions, pleasure and arousal, were examined using a first-order confirmatory factor analysis. Firstly, compared with the one-factor model, $\chi^2_{(54)} = 422.80$, $p < 0.001$, RMSEA = 0.25, CFI = 0.93, the two-factor model showed better goodness of fit, $\chi^2_{(53)} = 144.72$, $p < 0.001$, RMSEA = 0.10, CFI = 0.98. However, two items measuring arousal (sluggish–frenzied and unaroused–aroused) showed cross-loading. After removing these two items, the goodness of fit improved, $\chi^2_{(34)} = 88.55$, $p < 0.001$, RMSEA = 0.10, CFI = 0.98. Considering the sample size, number of indicators, and the improvement in goodness of fit, the aforementioned fit indices revealed that this final version of the measures of emotions had an acceptable fit.

Second, construct validity was assessed by examining convergent validity and discriminant validity. The convergent validity requirements were met. As indicated in Table 2, all standardized factor loadings exceeded 0.7. The values of average variance extracted were above 0.5, and both values of composite reliability and Cronbach's α exceeded 0.7. To examine discriminant validity, Anderson and Gerbing (1988) suggested that the confidence interval of the correlations (± 2 standard deviations) should not contain 1. Our results showed that the 95% confidence interval

of the pleasure–arousal correlation ($\gamma_{P-A} = 0.72$) ranged from 0.55 to 0.84; therefore, discriminant validity was confirmed.

Tourists' AIDA responses

The measures of tourists' AIDA responses were also examined using the same procedure. The four-factor model, $\chi^2_{(113)} = 368.94$, RMSEA = 0.12, CFI = 0.98, presented better goodness of fit than the one-factor model, $\chi^2_{(119)} = 591.26$, RMSEA = 0.17, CFI = 0.96. Four items showed cross-loading (two for desire and two for action), so these were deleted, and the goodness of fit improved, $\chi^2_{(59)} = 149.70$, RMSEA = 0.10, CFI = 0.99. The aforementioned fit indices revealed that this final version of the measures of tourists' AIDA responses had an acceptable fit.

After examining the goodness of fit, construct validity was evaluated. The requirement of convergent validity was met. As indicated in Table 3, all standardized factor loadings exceeded 0.7. The values of average variance extracted were above 0.5, and both values of composite reliability and Cronbach's α exceeded 0.7. Furthermore, the 95% confidence interval of the attention–interest correlation ($\gamma_{AT-I} = 0.93$) ranged from 0.88 to 0.96; the attention–desire correlation ($\gamma_{AT-D} = 0.81$) ranged from 0.68 to 0.89; the attention–action correlation ($\gamma_{AT-AC} = 0.67$) ranged from 0.48 to 0.80; the interest–desire correlation ($\gamma_{I-D} = 0.82$) ranged from 0.70 to 0.90; the interest–action correlation ($\gamma_{I-AC} = 0.74$) ranged from 0.57 to 0.84; and the desire–action correlation ($\gamma_{D-AC} = 0.76$) ranged from 0.61 to 0.86. Since none of the confidence intervals of the correlations (± 2 standard deviations) contained 1.0 (Anderson & Gerbing, 1988), discriminant validity was confirmed.

Hypotheses testing

A MANOVA analysis that specified tourists' AIDA responses as a function of information presentation modes was performed. Age, education, and gender were control variables in the model. The results of MANOVA are shown in Table 4. The two presentation modes produced differences across participants' AIDA responses (Wilk's $\lambda = 0.61$, F value = 28.13, $p < 0.001$) while the effects of the three control variables were not significant. The VR mode had a greater effect than the picture mode on consumers' attention ($M_V = 5.80$, $M_P = 4.37$, $p < 0.001$), interest ($M_V = 5.95$, $M_P = 4.65$, $p < 0.001$), desire ($M_V = 5.85$, $M_P = 4.70$, $p < 0.001$), and action ($M_V = 5.94$, $M_P = 5.02$, $p < 0.001$). These results support H1a, H1b, H1c, and H1d.

In order to examine H2, MANCOVA analysis that specified tourists' AIDA responses as a function of

Table 4. Results of MANOVA analysis (H1).

Control and independent Variables ^a	Dependent Variables	Mean Squares ^b	F value	p-value
Presentation mode ^b	Attention	83.33	105.12	<0.001
Age		0.90	1.14	0.34
Education		0.49	0.62	0.61
Gender		0.27	0.34	0.56
Presentation mode ^b	Interest	70.67	81.74	<0.001
Age		0.73	0.84	0.50
Education		0.35	0.41	0.75
Gender		0.60	0.69	0.41
Presentation mode ^b	Desire	53.32	59.59	<0.001
Age		0.87	0.97	0.42
Education		0.19	0.22	0.89
Gender		1.16	1.29	0.26
Presentation mode ^b	Action	34.75	41.43	<0.001
Age		0.15	0.18	0.95
Education		0.10	0.12	0.95
Gender		1.33	1.58	0.21

^aControl variables: Age, education, and gender.

^bType III mean squares.

^cPresentation mode is manipulated into two types: VR and picture.

information presentation modes, pleasure, and an interaction form was performed. Pleasure was treated as a continuous moderator with respect to the effects of information presentation modes on participants' AIDA responses. As with the MANOVA analysis, age, education, and gender were control variables in the MANCOVA model. The MANCOVA results are shown in Table 5. The effects of information presentation modes on participants' AIDA responses were not moderated by pleasure (Wilk's $\lambda = 0.98$, $F = 0.73$, $p > 0.05$). Thus, H2 is not supported. To further understand the role of pleasure in the relationship between information presentation modes and AIDA responses, a mean split was used to classify tourists into high-pleasure and low-pleasure groups ($M_{HP} = 6.13$, $M_{LP} = 4.59$, $t = 20.19$, $p < 0.01$).

Table 5. Results of MANCOVA analysis (pleasure as moderator).

Control and independent Variables ^a	Dependent Variables	Mean Squares ^b	F value	p-value
Presentation mode (A) ^c	Attention	2.18	4.66	0.03
Pleasure (B)		53.37	113.97	<0.001
A * B		0.61	1.31	0.25
Age		1.10	2.35	0.13
Education		0.68	1.44	0.23
Gender		2.17	4.64	0.03
Presentation mode (A) ^c	Interest	2.20	4.67	0.03
Pleasure (B)		62.96	133.8	<0.001
A * B		0.91	1.93	0.17
Age		1.47	3.13	0.08
Education		0.49	1.03	0.38
Gender		3.38	7.18	0.01
Presentation mode (A) ^c	Desire	0.73	1.44	0.23
Pleasure (B)		66.00	129.79	<0.001
A * B		0.22	0.44	0.51
Age		0.13	0.25	0.62
Education		0.07	0.14	0.93
Gender		4.58	9.00	0.00
Presentation mode (A) ^c	Action	0.03	0.05	0.82
Pleasure (B)		39.47	65.32	<0.001
A * B		0.02	0.04	0.84
Age		0.15	0.24	0.62
Education		0.04	0.06	0.98
Gender		3.51	5.81	0.02

^aControl variables: Age, education, and gender.

^bType III mean squares.

^cPresentation mode is manipulated into two types: VR and picture.

Figure 4 shows how the two groups responded to VR and picture presentation modes in terms of AIDA responses. According to Figure 4, depending on whether a participant was in a high- or low-pleasure condition, VR mode had stronger AIDA responses than picture mode.

The same procedure was carried out to treat arousal as a continuous moderator. The results of the MANCOVA analysis are shown in Table 6. The effects of information presentation mode on participants' AIDA

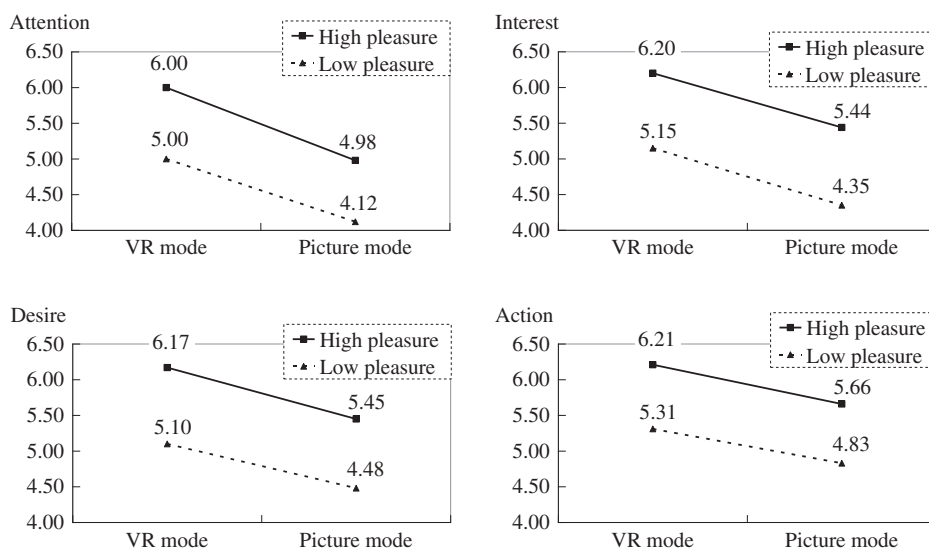


Figure 4. Pleasure as a moderator: no interaction effect.

Table 6. Results of MANCOVA analysis (arousal as moderator).

Control and independent Variables ^a	Dependent Variables	Mean Squares ^b	F value	p-value
Presentation mode (A) ^c	Attention	0.14	0.22	0.64
Arousal (B)		32.82	54.18	<0.001
A * B		0.25	0.42	0.52
Age		0.82	1.35	0.25
Education		0.26	0.43	0.73
Gender		0.37	0.61	0.43
Presentation mode (A) ^c	Interest	0.69	1.02	0.31
Arousal (B)		33.22	49.42	<0.001
A * B		0.02	0.02	0.88
Age		1.16	1.73	0.19
Education		0.48	0.72	0.54
Gender		1.03	1.53	0.22
Presentation mode (A) ^c	Desire	1.08	1.6	0.21
Arousal (B)		36.90	54.79	<0.001
A * B		2.33	3.47	0.06
Age		0.06	0.09	0.76
Education		0.07	0.10	0.96
Gender		1.00	1.48	0.23
Presentation mode (A) ^c	Action	2.76	4.06	0.05
Arousal (B)		20.87	30.64	<0.001
A * B		4.47	6.56	0.01
Age		0.11	0.16	0.69
Education		0.13	0.19	0.90
Gender		0.71	1.04	0.31

^aControl variables: Age, education, and gender.

^bType III mean squares.

^cPresentation mode is manipulated into two types: VR and picture.

responses were moderated by arousal. The interaction effect between information presentation mode and arousal was significant (Wilk's $\lambda = 0.91$, F value = 4.00, $p < 0.01$). These results support H3. Also, participants were classified into high-arousal and low-arousal groups by mean scores ($M_{HA} = 5.88$, $M_{LA} = 3.67$, $t = 24.64$, $p < 0.01$). Figure 5 shows how the two groups responded to the VR and picture presentation modes in terms of AIDA responses. According to Figure 5, highly

aroused participants had stronger AIDA responses in VR mode than in picture mode. However, for participants with a low arousal level, the differences in AIDA responses between VR mode and picture mode were not statistically significant.

Implications for research

Given that the effectiveness of VR has been challenged, this study was designed to gather more statistical evidence about the nature of the relationship between presentation mode and consumer responses, and the variables that may bias the relationship. Previous studies using the SOR framework argued that emotions may mediate the effects of presentation mode on consumers' responses. The authors of the current study modified this framework, and based on cognitive appraisal theory, they suggested that consumer emotions may vary according to individual within the same presentation mode. Thus emotion should be treated as a moderating variable. The authors tested these hypotheses in the context of Internet tourism marketing, and the results demonstrated that the VR mode outperformed picture mode in attracting participant attention, igniting their interest, generating desire, and increasing their intentions to act on the advertised destinations. These findings are consistent with previous ones that found virtual product experiences, three-dimensional virtual world environments, three-dimensional advertising, and VR interfaces have superior effects on tourists (see for example Jiang & Benbasat, 2007; Li et al., 2002; Nah et al., 2011; Suh & Lee, 2005).

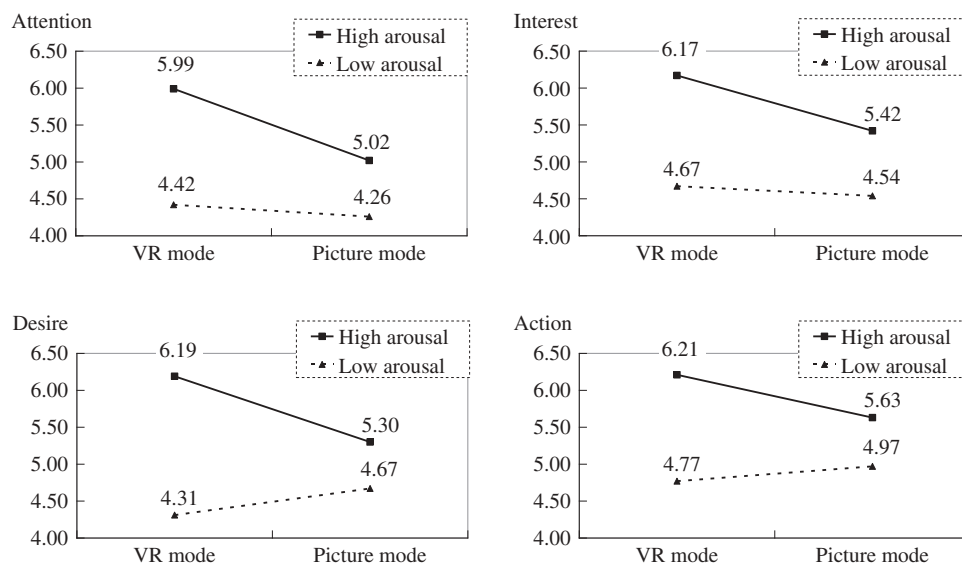


Figure 5. Arousal as a moderator: interaction effect.

In addition, all the participants' four responses to the VR mode were stronger than to picture mode regardless of their level of pleasure, and pleasure did not have a moderating effect on the relationship between information presentation mode and participants' AIDA responses. Previous VR studies may provide a possible explanation for this unexpected finding. Fiore, Kim, and Lee (2005) suggested that VR delivers both instrumental value and experiential value (i.e. pleasure) to consumers. Shih (1998) confirmed that compared with picture advertisements, VR advertisements can enrich consumers' fantasy and imagination, which are the main elements of fun and playfulness. Thus, even if tourists belong to a low-pleasure category, the effects of VR on their AIDA responses should still be higher than picture mode.

The findings also found evidence that arousal has a moderating effect on the relationship between information presentation modes and tourist AIDA responses. The superiority of VR mode over picture mode was still significant for highly aroused participants. However, this was not the case for participants with a low level of arousal. When participants were in a low-arousal condition, the VR mode had the same, and even worse, effect on AIDA responses than the picture mode. This new finding suggests that when tourists are in a low-arousal condition, they are more likely to think that the three-dimensional attraction presentation is irritating, and thus exhibit a worse AIDA attitude than highly aroused tourists.

Considering all the results of our study, a possible explanation for the negative result for H2 may be that pleasure and arousal are not independently interrelated (Kuppens, 2008). Koo and Lee (2011) claimed that arousal is cognition-related and is responsible for information-processing, but pleasure is the result of pure evaluation. Moreover, some researchers have advocated that energetic arousal increases pleasure, and tense arousal has a negative effect on pleasure (Bigné, Andreu, & Gnoth, 2005; Ding & Lin, 2012; Kaltcheva & Weitz, 2006; Koo & Lee, 2011; Massara, Liu, & Melara, 2010). Accordingly, the activation of consumer emotion is the prerequisite for pleasure. The empirical results of the current study, to some extent, echo this contention without statistical support. Once participants' emotions were aroused, the four responses to VR mode were superior to those of the picture mode, and this was also the case when participants were in a high-pleasure as well as in a low-pleasure frame. Conversely, participants with a low level of arousal may have felt bored or sleepy, and were less likely to activate cognitive resources to process information. The findings of this

study suggest the modification of SOR could advance the theoretical development. Thus, the response differences between VR mode and picture mode may not be significant.

Implications for practice

This study investigated the effect of information presentation mode on tourists' AIDA responses, and it treated emotions' moderating factors on the relationship between marketing stimuli and tourist responses. These findings have several important implications for Internet tourism marketing practice. First, the superior effects of VR on participants' AIDA responses appeared in both high- and low-pleasure groups. This suggests that no matter whether a tourist is in a high- or a low-pleasure state, three-dimensional VR presentations can motivate and enhance tourist attention, interest, desire, and action responses towards a specific attraction. The findings also imply that VR mode is a better choice to promote attractions than picture mode for both high- and low-pleasure tourists. Additionally, according to Figure 5, the more pleasure a VR presentation mode can deliver, the more likely tourists will prefer the presented attraction. Considering that pleasure is one of the major motivations for traveling, the authors advise destination and attraction marketers to adopt VR technology as a main presentation tool. Guttentag (2010) reported that VR has various types, including 360-degree panorama, augmented reality, which combines real and virtual worlds, and genuine VR, which is a simulated environment. Each type involves distinct technological complexity and production costs. Therefore, the authors suggest that online tourism marketers should conduct cost-benefit evaluations and choose the most appropriate VR type to meet their online marketing goals and budget.

Second, it is worth noting that the superior effects of VR mode on participants' AIDA responses appeared only in the high arousal group. Therefore, the authors recommend that the elements that stimulate tourists' sense of arousal should be critical considerations when designing VR attractions and promotions. In general, the arousal-stimulating elements can be web-related and content-related. For example, for web-related elements, Sanchez-Franco and Rondan-Cataluña (2010) claimed that there is a positive relationship between visual aesthetics and virtual travel community members' arousal. Some studies have suggested that tourism marketers arouse consumers with the use of color and background music while developing VR presentations of destinations (Andersson et al., 2012; Ding & Lin, 2012; Kaltcheva & Weitz, 2006). Destinations presented

with highly saturated colors and energetic music are more likely to enhance consumers' arousal and propel them to process product travel information. For content-related elements, Pearce (2009) pointed out that humor successfully leads to arousal and attracts first time tourists. Therefore, the authors suggest that online tourism marketers should engage in designing amusing and humorous VR content to increase the superior effects of VR mode on tourists' AIDA responses.

Limitations and future research

While this study was conducted with methodological rigor, two limitations relating to the experimental method and the non-probability sample should be considered when interpreting the findings.

First, two approaches exist in e-consumer behavior research: web usage mining (WUM)-based and non-WUM-based. The former approach utilizes data mining techniques, while the latter approach makes use of alternative methods, such as surveys and experiments (Jenamani, Mohapatra, & Ghose, 2003). In this study, a non-WUM-based experimental method was utilized. In the context of shopping environments, Massara et al. (2010) found that hedonic and utilitarian goals represent individuals' goals that influence their emotions. However, the participants in this study may have engaged in goal-directed browsing with primarily utilitarian browsing goals rather than hedonic browsing goals. Thus, future research should seek to avoid this potential limitation by conducting research in more natural settings.

Second, the use of a non-probability sample, in this case a convenience sample, also has some limitations. The majority of the respondents in both the VR and the picture modes were 30 years old and under, and they had attained a bachelor's or associate's degree (see Table 1). Given this homogeneity, comparisons between the two modes were deemed viable. However, strictly speaking, in order to make solid statistical inferences, future researcher should adopt probability sampling techniques (Saunders, Lewis, & Thornhill, 2009).

The findings of this study also suggest some directions for future research. First, researchers could elaborate on the findings of this study by taking the characteristics of the tourist destinations into consideration. Wan et al. (2007) found that compared with theme parks, using virtual experiences and brochures in for nature parks did not lead to significant differences in advertising effects. In the light of their findings, it would be helpful for future studies to explore whether the findings of the current study can be generalized to all types of travel destinations and attractions.

Second, future studies can take user characteristics into consideration. The current findings support arousal's role as a moderator; however, as suggested by Donovan and Rossiter (1982), individuals' arousal reactions to environmental stimuli are thought to be mediated by individual differences in their arousal-ability (i.e. their characteristic way of filtering incoming stimuli, such as being screeners or non-screeners). In the light of their suggestion, future studies should explore whether arousal as a moderator is applicable to all types of consumers (screeners and non-screeners).

Finally, Baloglu (1997) suggested that tourists' travel experiences may bias the effect of information presentation mode on consumer response. For inexperienced tourists, the destination information received from the presentation mode could result in visit intentions directly through emotion. For experienced tourists, the destination information might impact revisit intentions directly and indirectly through emotions. Therefore, future studies could consider the moderating effect of tourists' travel experience on the relationship between information presentation mode and consumer response.

Conclusions

While VR has been widely used in tourism industry to provide destination information to consumers, whether it always show better communication effectiveness than other presentation mode is challenged. To re-examine the relationship between presentation mode and consumer response, this study modified the SOR framework (Mehrabian & Russell, 1974) based on cognitive appraisal theory (Lazarus, 1991), and investigated how emotions (i.e. pleasure and arousal) moderate the effect of information presentation mode (VR and picture modes) on tourists' AIDA responses (i.e. attention, interest, desire, and action) in the context of online tourism marketing and advertising. The results indicate that arousal moderates the effects of information presentation modes on tourist AIDA responses, but pleasure does not. Specifically, the superior effects of the VR mode on tourists' AIDA responses are associated with the high arousal, high pleasure, and low pleasure groups, but not in the low arousal group. That is, if consumers are not emotionally aroused, the presentation effectiveness between VR and picture is not significant. The findings of this study suggest the modification of SOR framework could advance the theoretical development. Also, practitioners in tourism industry are advised to focus on arousal element while developing destination presentation strategy.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Adelaar, T., Chang, S., Lancendorfer, K. M., Lee, B., & Morimoto, M. (2003). Effects of media formats on emotions and impulse buying intent. *Journal of Information Technology*, 18(4), 247–266. doi:10.1080/0268396032000150799
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. doi:10.1037/0033-2909.103.3.411
- Andersson, P. K., Kristensson, P., Wästlund, E., & Gustafsson, A. (2012). Let the music play or not: The influence of background music on consumer behavior. *Journal of Retailing and Consumer Services*, 19(6), 553–560. doi:10.1016/j.jretconser.2012.06.010
- Bagozzi, R. P., Gopinath, M., & Nyer, P. U. (1999). The role of emotions in marketing. *Journal of the Academy of Marketing Science*, 27(2), 184–206. doi:10.1177/0092070399272005
- Baloglu, S. (1997). The relationship between destination images and sociodemographic and trip characteristics of international travellers. *Journal of Vacation Marketing*, 3(3), 221–233. doi:10.1177/135676679700300304
- Beerli, A., & Martín, J. D. (2004). Factors influencing destination image. *Annals of Tourism Research*, 31(3), 657–681. doi:10.1016/j.annals.2004.01.010
- Bigné, J. E., Andreu, L., & Gnoth, J. (2005). The theme park experience: An analysis of pleasure, arousal and satisfaction. *Tourism Management*, 26(6), 833–844. doi:10.1016/j.tourman.2004.05.006
- Biocca, F. (1992). Communication within virtual reality: Creating a space for research. *Journal of Communication*, 42(4), 5–22. doi:10.1111/jcom.1992.42.issue-4
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—the state of eTourism research. *Tourism Management*, 29(4), 609–623. doi:10.1016/j.tourman.2008.01.005
- Cheong, R. (1995). The virtual threat to travel and tourism. *Tourism Management*, 16(6), 417–422. doi:10.1016/0261-5177(95)00049-T
- Cho, Y.-H., Wang, Y., & Fesenmaier, D. R. (2002). Searching for experiences: The web-based virtual tour in tourism marketing. *Journal of Travel & Tourism Marketing*, 12(4), 1–17. doi:10.1300/J073v12n04_01
- Coyle, J. R., & Thorson, E. (2001). The effects of progressive levels of interactivity and vividness in web marketing sites. *Journal of Advertising*, 30(3), 65–77. doi:10.1080/00913367.2001.10673646
- de Rojas, C., & Camarero, C. (2008). Visitors' experience, mood and satisfaction in a heritage context: Evidence from an interpretation center. *Tourism Management*, 29(3), 525–537. doi:10.1016/j.tourman.2007.06.004
- Debbabi, S., Daassi, M., & Baile, S. (2010). Effect of online 3D advertising on consumer responses: The mediating role of telepresence. *Journal of Marketing Management*, 26(9–10), 967–992. doi:10.1080/02672570903498819
- Desmet, P. (2010). Are emotions consequences of affective expectations? A commentary essay. *Journal of Business Research*, 63(8), 903–904. doi:10.1016/j.jbusres.2009.09.006
- Ding, C. G., & Lin, C.-H. (2012). How does background music tempo work for online shopping? *Electronic Commerce Research and Applications*, 11(3), 299–307. doi:10.1016/j.elerap.2011.10.002
- Donovan, R. J., & Rossiter, J. R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing*, 58(1), 34–57.
- Donovan, R. J., Rossiter, J. R., Marcoolyn, G., & Nesdale, A. (1994). Store atmosphere and purchasing behavior. *Journal of Retailing*, 70(3), 283–294. doi:10.1016/0022-4359(94)90037-X
- Doolin, B., Burgess, L., & Cooper, J. (2002). Evaluating the use of the Web for tourism marketing: A case study from New Zealand. *Tourism Management*, 23(5), 557–561. doi:10.1016/S0261-5177(02)00014-6
- Elliott, R. (1997). Existential consumption and irrational desire. *European Journal of Marketing*, 31(3/4), 285–296. doi:10.1108/03090569710162371
- Fiore, A. M., Kim, J., & Lee, H.-H. (2005). Effect of image interactivity technology on consumer responses toward the online retailer. *Journal of Interactive Marketing*, 19(3), 38–53. doi:10.1002/dir.20042
- Fortin, D. R., & Dholakia, R. R. (2005). Interactivity and vividness effects on social presence and involvement with a web-based advertisement. *Journal of Business Research*, 58(3), 387–396. doi:10.1016/S0148-2963(03)00106-1
- Gledhill, D., Tian, G. Y., Taylor, D., & Clarke, D. (2003). Panoramic imaging—A review. *Computers & Graphics*, 27(3), 435–445. doi:10.1016/S0097-8493(03)00038-4
- Gratzer, M., Werthner, H., & Winiwarter, W. (2004). Electronic business in tourism. *International Journal of Electronic Business*, 2(5), 450–459. doi:10.1504/IJEB.2004.005878
- Griffith, D. A., & Gray, C. C. (2002). The fallacy of the level playing field: The effect of brand familiarity and web site vividness on online consumer response. *Journal of Marketing Channels*, 9(3–4), 87–102. doi:10.1300/J049v09n03_05
- Grohmann, B., Spangenberg, E. R., & Sprott, D. E. (2007). The influence of tactile input on the evaluation of retail product offerings. *Journal of Retailing*, 83(2), 237–245. doi:10.1016/j.jretai.2006.09.001
- Guttentag, D. A. (2010). Virtual reality: Applications and implications for tourism. *Tourism Management*, 31(5), 637–651. doi:10.1016/j.tourman.2009.07.003
- Hair, J. F. Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Upper Saddle River, NJ: Pearson Education.
- Hamilton, R. W., & Thompson, D. V. (2007). Is there a substitute for direct experience? Comparing consumers' preferences after direct and indirect product experiences. *Journal of Consumer Research*, 34(4), 546–555. doi:10.1086/520073
- Hoffman, D. L., & Novak, T. P. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing*, 60(3), 50–68. doi:10.2307/1251841
- Huang, Y. C., Backman, S. J., Backman, K. F., & Moore, D. (2013). Exploring user acceptance of 3D virtual worlds in travel and tourism marketing. *Tourism Management*, 36, 490–501. doi:10.1016/j.tourman.2012.09.009

- Huey, B. (1999). Advertising's double helix: A proposed new process model. *Journal of Advertising Research*, 39(3), 43–51.
- Hul, M. K., Dube, L., & Chebat, J.-C. (1997). The impact of music on consumers' reactions to waiting for services. *Journal of Retailing*, 73(1), 87–104. doi:10.1016/S0022-4359(97)90016-6
- Hynes, N., & Manson, S. (2016). The sound of silence: Why music in supermarkets is just a distraction. *Journal of Retailing and Consumer Services*, 28, 171–178. doi:10.1016/j.jretconser.2015.10.001
- Hyun, M. Y., & O'Keefe, R. M. (2012). Virtual destination image: Testing a telepresence model. *Journal of Business Research*, 65(1), 29–35. doi:10.1016/j.jbusres.2011.07.011
- Hyun, S. S., Kim, W., & Lee, M. J. (2011). The impact of advertising on patrons' emotional responses, perceived value, and behavioral intentions in the chain restaurant industry: The moderating role of advertising-induced arousal. *International Journal of Hospitality Management*, 30(3), 689–700. doi:10.1016/j.ijhm.2010.10.008
- Izen, A. M. (1987). Positive affect, cognitive processes, and social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. New York, NY: Academic Press.
- Jacob, C., Guéguen, N., & Petr, C. (2010). Media richness and internet exploration. *International Journal of Tourism Research*, 12(3), 303–305. doi:10.1002/jtr.v12:3
- Jenamani, M., Mohapatra, P. K. J., & Ghose, S. (2003). A stochastic model of e-customer behavior. *Electronic Commerce Research and Applications*, 2(1), 81–94. doi:10.1016/S1567-4223(03)00010-3
- Jiang, Z., & Benbasat, I. (2007). The effects of presentation formats and task complexity on online consumers' product understanding. *MIS Quarterly*, 31(3), 475–500.
- Jin, S.-A.-A. (2009). The roles of modality richness and involvement in shopping behavior in 3D virtual stores. *Journal of Interactive Marketing*, 23(3), 234–246. doi:10.1016/j.intmar.2009.04.005
- Kahai, S. S., & Cooper, R. B. (2003). Exploring the core concepts of media richness theory: The impact of cue multiplicity and feedback immediacy on decision quality. *Journal of Management Information Systems*, 20(1), 263–299.
- Kaltcheva, V. D., & Weitz, B. A. (2006). When should a retailer create an exciting store environment? *Journal of Marketing*, 70(1), 107–118. doi:10.1509/jmkg.2006.70.1.107
- Kim, T., & Biocca, F. (1997). Telepresence via television: Two dimensions of telepresence may have different connections to memory and persuasion. *Journal of Computer-Mediated Communication*, 3(2). Retrieved from <http://jcmc.indiana.edu/vol3/issue2/kim.html>
- Klein, L. R. (2003). Creating virtual product experiences: The role of telepresence. *Journal of Interactive Marketing*, 17(1), 41–55. doi:10.1002/dir.10046
- Koo, D.-M., & Lee, J.-H. (2011). Inter-relationships among dominance, energetic and tense arousal, and pleasure, and differences in their impacts under online vs. offline environment. *Computers in Human Behavior*, 27(5), 1740–1750. doi:10.1016/j.chb.2011.03.001
- Kotler, P., Ang, S. H., Leong, S. M., & Tan, C. T. (2003). *Marketing management: An Asian perspective*. Singapore: Prentice Hall.
- Kuppens, P. (2008). Individual differences in the relationship between pleasure and arousal. *Journal of Research in Personality*, 42(4), 1053–1059. doi:10.1016/j.jrp.2007.10.007
- Laros, F. J. M., & Steenkamp, J. B. E. M. (2005). Emotions in consumer behavior: A hierarchical approach. *Journal of Business Research*, 58(10), 1437–1445. doi:10.1016/j.jbusres.2003.09.013
- Lazarus, R. S. (1991). *Emotion and adaptation*. NY: Oxford University Press.
- Lee, K. C., & Chung, N. (2008). Empirical analysis of consumer reaction to the virtual reality shopping mall. *Computers in Human Behavior*, 24(1), 88–104. doi:10.1016/j.chb.2007.01.018
- Lee, O., & Oh, J.-E. (2007). The impact of virtual reality functions of a hotel website on travel anxiety. *Cyberpsychology & Behavior*, 10(4), 584–586. doi:10.1089/cpb.2007.9987
- Leenders, M. A. A. M., Smidts, A., & El Haji, A. (in press). Ambient scent as a mood inducer in supermarkets: The role of scent intensity and time-pressure of shoppers. *Journal of Retailing and Consumer Services*.
- Li, H., Daugherty, T., & Biocca, F. (2001). Characteristics of virtual experience in electronic commerce: A protocol analysis. *Journal of Interactive Marketing*, 15(3), 13–30. doi:10.1002/dir.1013
- Li, H., Daugherty, T., & Biocca, F. (2002). Impact of 3-D advertising on product knowledge, brand attitude, and purchase intention: The mediating role of presence. *Journal of Advertising*, 31(3), 43–57. doi:10.1080/00913367.2002.10673675
- Li, H., Daugherty, T., & Biocca, F. (2003). The role of virtual experience in consumer learning. *Journal of Consumer Psychology*, 13(4), 395–407. doi:10.1207/S15327663JCP1304_07
- Lin, Y.-S., & Huang, J.-Y. (2006). Internet blogs as a tourism marketing medium: A case study. *Journal of Business Research*, 59(10–11), 1201–1205. doi:10.1016/j.jbusres.2005.11.005
- Lombard, M., & Snyder-Duch, J. (2001). Interactive advertising and presence: A framework. *Journal of Interactive Advertising*, 1(2), 56–65. doi:10.1080/15252019.2001.10722051
- Luong, A. (2005). Affective service display and customer mood. *Journal of Service Research*, 8(2), 117–130. doi:10.1177/1094670505279341
- Massara, F., Liu, S. S., & Melara, R. D. (2010). Adapting to a retail environment: Modeling consumer–environment interactions. *Journal of Business Research*, 63(7), 673–681. doi:10.1016/j.jbusres.2009.05.004
- Mazaheri, E., Richard, M.-O., & Laroche, M. (2011). Online consumer behavior: Comparing Canadian and Chinese website visitors. *Journal of Business Research*, 64(9), 958–965. doi:10.1016/j.jbusres.2010.11.018
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. Cambridge, MA: MIT Press.
- Menon, S., & Kahn, B. (2002). Cross-category effects of induced arousal and pleasure on the Internet shopping experience. *Journal of Retailing*, 78(1), 31–40. doi:10.1016/S0022-4359(01)00064-1
- Mervis, C. B., & Rosch, E. (1981). Categorization of natural objects. *Annual Review of Psychology*, 32(1), 89–115. doi:10.1146/annurev.ps.32.020181.000513
- Mollen, A., & Wilson, H. (2010). Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives. *Journal of Business Research*, 63(9–10), 919–925. doi:10.1016/j.jbusres.2009.05.014
- Nah, F. F. H., Eschenbrenner, B., & DeWester, D. (2011). Enhancing brand equity through flow and telepresence: A

- comparison of 2D and 3D virtual worlds. *MIS Quarterly*, 35(3), 731–747.
- Pearce, P. L. (2009). NOW THAT IS FUNNY: Humour in tourism settings. *Annals of Tourism Research*, 36(4), 627–644. doi:10.1016/j.annals.2009.05.003
- Ranjbarian, B., Shaemi, A., & Ebrahimian Jolodar, S. Y. (2011). Assessing the effectiveness of electric conservation advertisements in Isfahan channel television. *International Business Research*, 4(3), 194–200. doi:10.5539/ibr.v4n3p194
- Richins, M. L. (1997). Measuring emotions in the consumption experience. *Journal of Consumer Research*, 24(2), 127–146. doi:10.1086/jcr.1997.24.issue-2
- Russell, J. A., & Mehrabian, A. (1974). Distinguishing anger and anxiety in terms of emotional response factors. *Journal of Consulting and Clinical Psychology*, 42(1), 79–83. doi:10.1037/h0035915
- Russell, J. A., & Mehrabian, A. (1976). Environmental variables in consumer research. *Journal of Consumer Research*, 3(1), 62–63. doi:10.1086/jcr.1976.3.issue-1
- Russell, J. A., & Pratt, G. (1980). A description of the affective quality attributed to environments. *Journal of Personality & Social Psychology*, 38(2), 311–322. doi:10.1037/0022-3514.38.2.311
- Ruth, J. A., Brunel, F. F., & Otnes, C. C. (2002). Linking thoughts to feelings: Investigating cognitive appraisals and consumption emotions in a mixed-emotions context. *Journal of the Academy of Marketing Science*, 30(1), 44–58. doi:10.1177/03079459994317
- Sanchez-Franco, M. J., & Rondan-Cataluña, F. J. (2010). Virtual travel communities and customer loyalty: Customer purchase involvement and web site design. *Electronic Commerce Research and Applications*, 19(2), 171–182. doi:10.1016/j.elerap.2009.05.004
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Essex: Pearson Education.
- Schaefer, A., Parker, R. S., & Haytko, D. (2011). Chinese and U.S. consumers' perceptions of the effectiveness of celebrity athlete endorsers. *Journal of Management and Marketing Research*, 6, 1–9.
- Shih, C.-F. (1998). Conceptualizing consumer experiences in cyberspace. *European Journal of Marketing*, 32(7/8), 65–663. doi:10.1108/03090569810224056
- Skadberg, Y. X., & Kimmel, J. R. (2004). Tourists' flow experience while browsing a Web site: Its measurement, contributing factors and consequences. *Computers in Human Behavior*, 20(3), 403–422. doi:10.1016/S0747-5632(03)00050-5
- Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication*, 42(4), 73–93. doi:10.1111/jcom.1992.42.issue-4
- Strong, E. K. Jr. (1925). Theories of selling. *Journal of Applied Psychology*, 9(1), 75–86. doi:10.1037/h0070123
- Suh, K. S., & Lee, Y. E. (2005). The effects of virtual reality on consumer learning: An empirical investigation. *MIS Quarterly*, 29(4), 673–697.
- Tang, L., Jang, S., & Morrison, A. (2012). Dual-route communication of destination websites. *Tourism Management*, 33(1), 38–49. doi:10.1016/j.tourman.2011.01.021
- Tsai, W.-H., Chou, W.-C., & Lai, C.-W. (2010). An effective evaluation model and improvement analysis for national park websites: A case study of Taiwan. *Tourism Management*, 31(6), 936–952. doi:10.1016/j.tourman.2010.01.016
- Walsh, G., Shiu, E., Hassan, L. M., Michaelidou, N., & Beatty, S. E. (2011). Emotions, store-environmental cues, store-choice criteria, and marketing outcomes. *Journal of Business Research*, 64(7), 737–744. doi:10.1016/j.jbusres.2010.07.008
- Wan, C. S., Tsaur, S. H., Chiu, Y. L., & Chiou, W. B. (2007). Is the advertising effect of virtual experience always better or contingent on different travel destinations? *Information Technology & Tourism*, 9(1), 45–54. doi:10.3727/109830507779637611
- Watson, D., Wiese, D., Vaidya, J., & Tellegen, A. (1999). The two general activation systems of affect: Structural findings, evolutionary considerations, and psychobiological evidence. *Journal of Personality & Social Psychology*, 76(5), 820–838. doi:10.1037/0022-3514.76.5.820
- Watson, L., & Spence, M. T. (2007). Causes and consequences of emotions on consumer behaviour: A review and integrative cognitive appraisal theory. *European Journal of Marketing*, 41(5/6), 487–511. doi:10.1108/03090560710737570
- Williams, K. D. (2014). The effects of dissociation, game controllers, and 3D versus 2D on presence and enjoyment. *Computers in Human Behavior*, 38, 142–150. doi:10.1016/j.chb.2014.05.040
- Yüksel, A. (2007). Tourist shopping habitat: Effects on emotions, shopping value and behaviours. *Tourism Management*, 28(1), 58–69. doi:10.1016/j.tourman.2005.07.017