

**Natural and built photographic images: Preference, complexity and recall**

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**Abstract**

An investigation of the effect of natural versus built images of tourism activities on consumer responses was undertaken, using a selection of tourism promotion photographs. A sample of 156 males and 175 females provided ratings for images including: preference (liking), degree of complexity, consumption vision, and recall. The research provides evidence for consumer preference for natural versus built images; shows the role of complexity as an association to image type; and demonstrates that areas of interest most liked within an image are different by gender. Tourism activity images that are predominantly natural are more likely to be recalled. This study contributes to the application of a new method using areas of interest to pinpoint elements of images that are most interesting.

**Keywords:** tourism images; consumption vision; heat maps; gender; preference; complexity; perceptual mapping; recall

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## **Introduction**

Today's society is an image society and tourism marketing is particularly ocular-centric (Feighey, 2003). The shift towards the Internet (Singh & Formica, 2006) and social media (Xiang & Gretzel, 2010) marketing makes story-telling or promotion through photographic images even more prevalent. Photographic images are influential in developing views of the destination and have become a critical factor to determine the success of destination image projection (MacKay, 2005; MacKay & Fesenmaier, 1997). Yet, many studies have typically used rating or ranking of verbal descriptions of destination attributes when investigating destination image, which has failed to capture the full dynamics of destination impression formulation, pointing to the importance of integrating visuals into tourism research (Dann, 1996; MacKay, 2005). Thus, it is argued that a greater emphasis on visual components (e.g. photographic images) of communication is important to tourism research and practice.

Research using photographs has previously been undertaken and includes topics such as congruency in image representations of destination in promotional materials and between tourism promotion and visitor expectation (Singh & Formica, 2006; Ye & Tussyadiah, 2011), the role of photography/postcards in destination image formation (Dann, 1996; MacKay, 2005; MacKay & Fesenmaier, 1997; Milman, 2011; Yüksel & Akgül, 2007), iconic versus generic images in marketing (Litvin & Mouri, 2009), image-evoked consumption vision (Walters, Sparks, & Herington, 2007), age related difference in memory for pictures (Smith & MacKay, 2001; MacKay & Smith, 2006), and gender images in marketing materials (Sirakaya & Sonmez, 2000). Other studies (e.g. Hunter, 2008; Stepchenkova & Zhan, 2013) have undertaken an investigation of tourist- and destination-generated photographs using a content analysis approach in devising typologies of tourists' pictures or pictorial maps of tourism destinations. While all the abovementioned studies offer useful insight to tourism

## Natural and built photographic images

marketing, there remains an opportunity to further understand the role and impact of visual images on tourists. In particular, gaining a deeper understanding of travellers' preferences for landscapes and photographic images of activities undertaken in different environments is of interest.

The present study seeks to investigate how potential tourists perceive various images of tourism activities. It employs an online methodology utilising quantitative and heat mapping procedures. In particular, we aim to answer these questions: (1) Do people prefer tourism oriented pictures of natural over built environments? (2) How does the level of complexity affect the preference for images? (3) Does preference of an image vary as a result of gender? Are there specific elements of an image that are preferred by males or females? (4) What types of images are most easily recalled and is recall related to ease of imagining one's self in the place depicted? This study contributes to the literature by adding to the small body of research on photographic tourism images and gender difference in responses to tourism images. It also uses a novel approach to collecting information about images in the form of selecting areas of interest within an image and creating heat maps to evaluate patterns. Such an approach makes a significant contribution by demonstrating specific elements within an image that people prefer/like. This paper also addresses issues that marketers need to consider when selecting photographs to portray their destination and products.

### **Visual communication in tourism**

Given the nature of tourism products being experience-based and intangible, images are critical in communicating destination attributes to potential travellers (Singh & Formica, 2006). Nevertheless, there is paucity in research informing the selection of effective images to represent tourism destinations, and marketers often select images based on 'gut feeling' (Dewar, Li, & Davis, 2007). Reliance on pictorial images to persuade is a distinct feature of

## Natural and built photographic images

contemporary promotion (Phillips & McQuarrie, 2004). Similarly, a large component of tourism promotion is undertaken on websites incorporating a range of photographic images of tourism attractions and activities. The use of images in tourism promotion provides several benefits over verbal materials. Images are attention-getting devices (Lidwell, Holden, & Butler, 2010; Miller & Stoica, 2004). They are remembered better (Levie & Hathaway, 1988; Lidwell et al., 2010; Laskey, Seaton, & Nicholls, 1994) because the greater perceptual richness in images stimulate higher cognitive elaboration and richer memory trace, leading to better long-term memory (Childers & Houston, 1984; Levie & Hathaway, 1988; Smith & MacKay, 2001). Images are also more persuasive because of their ability to evoke emotions (Smith & MacKay, 2001), and can better represent the real world situation (Miniard, Bhatla, Lord, Dickson & Unnava, 1991).

### **Tourism environment**

One dimension for considering the classification of photographic images is the extent to which an environment is natural or built. Tourism activities may be undertaken in a continuum between a purely natural setting (e.g. mountains, rainforests, oceans and rivers) and a highly constructed environment such as theme parks, hotels and casinos (Nadeau, Heslop, O'Reilly, & Luk, 2008). Similarly, tourism promotion frequently involves using images of a destination that corresponds to this continuum. This consideration of natural and built environments is justified by different theories of human-environment interactions (Ulrich et al., 1991). Studies of environmental aesthetics (Kaplan, Kaplan, & Wendt, 1972; van den Berg, Koole, & van der Wulp, 2003; Yu, 1995) have examined landscape preferences comparing natural scenes and urban/built scenes. These studies reported consistent higher preferences for natural landscape over man-made structures. This preference can be explained by the "biophilia effect" hypothesising a deep affiliation between human beings and nature as a biological need, because being close to nature offers a range of

## Natural and built photographic images

psychological benefits (Lidwell et al., 2010). Nature is seen as highly compatible with human purposes and inclinations, and the soft ‘fascination’ elements in nature (e.g. walking in the forest, cloud patterns) effortlessly engage attention, providing an opportunity for the mind to partake in reflection. In contrast, urban contexts do not provide as much a sense of ‘getting away’, to produce the same restorative opportunities (Kaplan, 1995; Lidwell et al., 2010; Ulrich et al., 1991).

Tourism destination image studies (e.g. Nadeau et al., 2008; Nadeau, O’Reilly, & Heslop, 2011) have also differentiated between the natural and the built environments. Beliefs about the two dimensions can influence the evaluation of a destination resulting in travel intentions (Nadeau et al., 2008). Nature based tourism products aim to attract people to national parks, wildlife reserves or areas of natural beauty, while mass tourism often entails more commercially oriented attractions of a purpose built kind. Images of these products have dominated promotional materials (MacKay, 2005; Yüksel & Akgül, 2007). Few tourism studies have explicitly examined travellers’ preferences for landscapes and photographic images of activities undertaken in different environments, although Dewar et al. (2007) revealed a preference for images portraying solitude in open natural space, and little interest in crowded scenes among young travellers.

One other factor to affect aesthetic preference and interest in scenery is complexity. Visual complexity is defined as the amount of details or the intricacy of the elements in a photograph (Alario & Ferrand, 1999). Berlyne et al.’s (1968) aesthetic theory suggests that interest and preference for a photograph are largely dependent on how complex such a stimulus is perceived by viewer. Moderately complex visuals are better liked (Kaplan et al., 1972; MacKay and Fesenmaier, 1997). A liking for moderate complexity results from customers’ ability to comprehend - the effort of comprehending complex images produces greater

## Natural and built photographic images

elaboration (Phillips & McQuarrie, 2004; Teng & Sun, 2002) and is pleurably arousing and so results in greater liking (McQuarrie & Mick, 1992; Phillips & McQuarrie, 2004). By adjusting the visual complexity to the optional level, marketers can increase viewers' pleasure of a visual stimulus (Tuch, Bargas-Avila, Opwis, & Wilhelm, 2009). Visual complexity of a photographic image is commonly measured by viewers' self-reported perception of complexity of the image (e.g. Alario & Ferrand, 1999; Creusen, Veryzer, Schoormans, 2010; Kaplan et al., 1972).

## **Gender**

Women are more visually oriented, and differ from men in judging meanings conveyed in nonverbal communication (Everhart, Shucard, Quatrin, & Shucard., 2001; Hall, 1984; Hall & Halberstadt, 1986; Kim, Lehto, & Morrison; 2007). MacKay and Fesenmaier's (1997) study on the role of pictorial stimuli in projecting destination image suggested gender as an influence on people's perception of the holiday and atmosphere dimensions of destination image. Similarly, Hem, Iversen and Grøngaug (2003) found that intention to visit based on viewing photos of nature based attractions is moderated by gender. However, their results offer mixed insight with men indicating greater intention to visit as a main effect, but women indicating greater intention to visit when positive feelings are also invoked by the images. Beerli and Martin (2004) also largely confirm a significant gender influence on the cognitive and affective components of the perceived image, especially among first time visitors.

In particular, gender also influences landscape and activity preference. Its influence can be direct or indirect through personalities (Macia, 1979). Women tend to evaluate/prefer destination attributes more favourably than men (Beerli and Martin, 2004; Meng & Uysal, 2008). In relation to photographic images, Lyons (1983) and Yu (1995) found gender difference in some images depicting a natural scene (e.g. forest, desert, and water-dominated

## Natural and built photographic images

scenes). Meng and Uysal (2008) revealed that while women appreciated natural scenery and recreational activities more than men, they did not value challenging activities such as hiking, skiing and horse riding as high as men. Xie, Costa, and Morais (2008) suggest that men and women are guided by their perspective gender role in society. As a result, women are more motivated by social reasons and natural explorations and they are more likely to go shopping, while males are more interested in fishing and hunting. It is not clear whether these differences will be reflected in their reactions to pictorial representations of these activities.

### **Recall and consumption vision**

Natural settings are more effective than built environments to evoke positive emotions and feelings, which enhances attention and in turn enhances memory (Berto, Baroni, Zainaghi, & Bettella, 2010; Hartig, Mang, & Evans, 1991; Hartig, Nyberg, Nilsson, & Garling, 1999).

Natural environments also offer a restorative experience that enhances human function and effectiveness, such as stress reduction and enhanced focus and concentration (Kaplan, 1995; Cawte, 1967; Sacks, 1987, cited in Kaplan, 1995; Well, 2000), leading to better recall.

Interestingly, these benefits can be derived from exposure to both real nature and imagery nature (Kaplan, 1995). Berto et al.'s (2010) study of pictorial images found that natural scenes were better recalled than built scenes. Similarly, Pan (2011) found that the more memorable scenes in a tourism TV commercial are directly associated with natural landscapes such as mountains and water.

When viewing photographic images consumers are often able to visualise themselves in the settings portrayed in the images. This self-related mental imagery is called consumption vision and has attracted some attention from tourism scholars (i.e., Chang, 2012; Lee & Gretzel, 2012; Walters et al., 2007). Escalas (2004) points out that people use mental simulation to construct narrative for what it is like, or will be like, to be situated in a



## Natural and built photographic images

consumption experience with a particular product. Consumer research has often stimulated imagery by asking potential consumers to imagine themselves with a product (e.g. car) (e.g. ). However, imagery associated with consumption may also be evoked through other stimulus such as photographic images (MacInnis & Price, 1987). Personal and internalised mental pictures of a destination elicited as part of consumption vision differs from destination image, which concerns the publicly held common mental image of a destination (Walters et al., 2007). Consumption vision is particularly relevant to the evaluation of hedonic experiences (e.g. tourism experiences) that are associated with pleasure, fantasy, and fun (Chang, 2012). The lack of tangibility of tourism products also makes consumption vision particularly influential, and possibly the only information source for tourists with no prior experience with the destination in the early stages of decision making (Walters et al., 2007). Images that evoke high consumption vision may also be remembered better. This is because imagery enhances both intentional and incidental learning by making the attributes of a product more concrete and more salient to positively affect consumers' ability to remember information (MacInnis & Price, 1987). In particular, consumption vision process involves individuals' highly relevant and meaningful elaborations of stimuli, which are considered as key determinants of deep information processing that leads to better recall (Lidwell et al., 2010). As mentioned earlier, consumption vision process promotes positive emotions, an effect similar to natural environment, which results in better recall. Research (i.e., Babin & Burns, 1997; Lee & Gretzel, 2012; Walters et al., 2007) has confirmed that pictures can induce consumption vision. Lee and Gretzel's (2012) study found an image of a beach scene to be highly significant in generating mental imagery. Similarly, Miller and Stoica (2003) also found beach scenes to increase mental imagery processes as did Walters et al. (2007). However, specific examination of particular images is less evident and often studies used a single or few images typically depicting a natural setting, raising the question of whether

## Natural and built photographic images

other images would also lead to an increase in mental imagery. Given consumption vision's ability to induce affection and desire to visit, it is critical to examine what photographic images can better induce consumption visions.

Extending the above review to tourism photographic stimuli, we propose that (1) images of activities undertaken in a natural environment are preferred more than images portraying activities in a built environment; (2) there is a positive association between moderate levels of complexity and preference; (3) females differ from their male counterparts in terms of interest in specific images or elements of an image (4) consumption vision will be greater for natural versus built images; and (5) better recalled images are those portraying a natural setting and those associated with high consumption vision.

## **Method**

This study aims to develop a greater understanding of the processing of visual images associated with tourism activities. Building on past research (Kaplan et al., 1972) it plots preference and complexity for images to demonstrate the role of natural versus built environments. The study further extends past research to provide information on the areas of images that are most interesting using a heat mapping process and compares gender effects. In summary, the study design uses an online survey approach that contains a range of photographic images that were presented to respondents and evaluated one at a time.

## **Stimulus and evaluation measures**

The stimulus for this research was a range of photographic images of tourism activities. Selection of photographic images used the following criteria: representative of the type of images used by Tourism Australia (the Australian Government agency responsible for attracting international visitors to Australia and encouraging Australians to travel

## Natural and built photographic images

domestically, both for leisure and business events) and reflective of the activities in either a built or natural environment. Images were of moderate resolution and were the same size. A total of 25 photographic images were used in the study<sup>1</sup>. Each image was to be evaluated by respondents using the following dimensions: environment context (natural through to built); preference for an image; complexity of the image; consumption vision; and representative of Australia. See Appendix A for details of items.

## Procedure

Photographic images were sourced from Tourism Australia's website ([www.tourism.australia.com](http://www.tourism.australia.com)) and a survey was developed in Qualtrics, an online survey tool. The selection of the images was based on a pre-test of tourism activities that were rated as occurring in predominantly natural or built environments. Prior to the main survey, 20 images were selected to represent either a tourism activity in a built or natural environment and these were randomly presented in a pre-test of the online survey (n=8) to academic staff in an effort to check the classification of images, respondent fatigue, functioning of the randomisation and clarity of the task. The same questions used in the main study were included in the pretesting. Following this pretesting phase, minor adjustments were made to highlight some instructions and the number of images was reduced from 20 to either 12 or 13 in each of two surveys, resulting in 25 images being tested in total. Two separate surveys were conducted with either 12 or 13 images. In each survey, half the images were selected to be representative of predominantly natural and half were of predominantly built environments. An image was randomly drawn (using a computerised function available within Qualtrics)

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<sup>1</sup> A supplementary file of all photographic images used in the study is available on request

## Natural and built photographic images

and presented to the respondent, thus reducing primacy or recency effects. The use of two sets of images to represent the constructs of natural versus built together with two separate samples was undertaken to strengthen the findings of images as representing the key construct as well as to prevent respondent fatigue.

A quota sampling approach was undertaken with the assistance of a market list company. The company was instructed to obtain a sample of adults (over 18 years) with an even mix of genders. Potential respondents were emailed an invitation to participate in a study on tourism images. The email contained basic information about the study, ethical clearance details and a link to the survey. The first task asked all respondents to review the image and then to click on the part of the image that they found most interesting as part of a *heat map area of interest* test. After this, respondents were asked to rate the image using a Likert-type scale on items designed to measure preference, complexity and consumption vision (see Appendix A for details). This process was repeated for each of the images contained within the sets of 12 or 13. On conclusion of this part of the survey, respondents were asked demographic questions. We also asked respondents to list any recalled images: “Thinking back over the tourism images you viewed, which ones (if any) do you remember well? Please list.” These were then coded by image in order of listing.

A total of 331 respondents participated in the two surveys (160 in sample 1 and 171 in sample 2), 53% were female. The majority of respondents (over 85%) were Caucasian and all were resident in Australia.

## Results

First, some preliminary checking was undertaken of the stimulus material to confirm images were classified as either built or natural. Thus, a factor analysis of the responses to the items

## Natural and built photographic images

regarding natural or built environment for each image was performed to check for accurate classification of images (following Kaplan et al. 1972). As the data were collected from two separate samples using different images to represent the built or natural environment, this analysis was undertaken for each sample. The two factor analyses, using varimax rotation, confirmed a pattern whereby those expected to be natural versus built loaded that way (see Appendix B). All loadings met the minimum requirement of 0.40; reliability based on Cronbach's alpha ranged from .73-.79. Using the item assessing respondent agreement whether the image was depicting a tourism activity in a total natural (1) through to totally built (5) a composite for the natural or built images was constructed. Following this, a further mean difference test was undertaken to confirm the manipulation of natural versus built images was correct. For sample 1, natural images had a mean of 1.50 whereas built images had a mean of 4.18 ( $p < .001$ ); and for sample 2, natural images had a mean of 1.54 whereas built images had a mean of 4.03 ( $p < .001$ ). This result supported proceeding to the next stage of analysis, using the images classified as either predominantly natural or built.

To answer the first research proposition on whether people prefer tourism-oriented pictures of natural or built environments we conducted a t-test analysis, with the categories of natural or built images and the dependent composite variable of preference. Based on analysis of overall mean differences for each sample, the results demonstrated a preference for natural images over built images:  $M =_{\text{natural}} 3.2$  vs  $_{\text{built}} 2.88$ ,  $t = 6.36$ ,  $df 156$ ,  $p < .001$  (images viewed by sample 1);  $M =_{\text{natural}} 3.16$  vs  $_{\text{built}} 2.89$ ,  $t = 5.96$ ,  $df 168$ ,  $p < .001$  (images viewed by sample 2). Thus, the first proposition was confirmed.

Next, in order to answer proposition 2 that there is a positive association between complexity and preference, we mapped the relationship between complexity and preference. Using a composite variable representing preference for an image and a two item composite measuring

## Natural and built photographic images

complexity (see Appendix A), a two dimensional perceptual map was created to plot the individual activities (depicted as representative of natural or built). As shown in Figure 1, the images of natural environment tourism activities were mostly preferred over images of built tourism activities. In Figure 1 there is evidence that only one built image is more highly preferred than others and this relates to the fireworks image, which is set outdoors. The one natural image that falls quite low on the preference scale is 'rock climber'.

*Insert Figure 1 about here*

The material plotted in Figure 1 also helps to demonstrate the role of complexity. Based on correlation analysis, it appears that complexity plays a smaller role for preference when it comes to natural images ( $r=.51$ ,  $p = .07$ ). There is a greater linear pattern for built images suggesting that as complexity increases so too does preference ( $r=.82$ ,  $p = .001$ ). Thus, complexity explains more of variance in preference for built images than it does for natural images. Using regression analysis we also tested the association of environment and complexity with image preference. Results confirm there is a linear association (Adjusted  $R^2 = .74$ ), with both environment ( $\beta = .39$ ,  $t=3.15$ ,  $p <.01$ ) and complexity ( $\beta = .74$ ,  $t=5.40$ ,  $p <.001$ ). Thus, preference increases with natural images and complexity levels. However, the two highest (preferred) rated built settings (images of fireworks and the Sydney Harbour Bridge) also included some elements of nature in respect of water, and they contained an iconic building (the Sydney Opera House) in the background which may increase the preference rating for a built image. Drilling down within images using the heat map function shows that the iconic building has a high degree of interest, with 41% and 26% of the respondents rating it as the most interesting element for the fireworks and harbour bridge images, respectively.

## Natural and built photographic images

Next, to test proposition 3, that females differ from their male counterparts in terms of interest in specific images or elements of an image, we investigated gender differences for preference on each image using t-tests (see Table 1). Significant differences (at the  $p < .05$  level) were found on five of the images; all were images of built activities. Females rated shopping, a day spa and duty free shop higher than males, whereas males rated the Australian pub and base jumping higher. Preference ratings for other images were not significantly different.

Therefore, reasonable support for the proposition of gender differences was found.

*Insert Table 1 about here*

Images that had a significant gender difference were followed up by examining the heat maps that had been collected based on respondents indicating the area (element) of the photographic image that was most interesting. Regions of interest were created around components of the heat map that indicated a reasonable level of interest, and the percentages for the males and females for each region were compared. As an illustration, the heat maps for two images are reproduced here (see Exhibit 1 and 2). In Exhibit 1 of an Australian Pub, 33% of males found the beer can of most interest, whereas only 18% of females found the beer can of interest ( $\chi^2(2, N = 139) = 6.12, p < .05$ ). Although not significantly different, a similar trend for the hotel sign was demonstrated with 36% of females indicating the sign was of interest compared to 26% for males. Exhibit 2 of a shopping centre shows that 36% of males were interested in the clock face compared with 24% of women, who also indicated more interest (18%) in the jewellery display than males (10%) ( $\chi^2(1, N = 76) = 3.90, p < .05$ ). These results lend some support that males versus females are focussing on different elements of the image.

*Insert Exhibit 1 and 2 about here*

## Natural and built photographic images

We were also interested to test whether consumption vision varied for natural versus built images (proposition 4). Statistical tests revealed that natural images were more likely to elicit higher consumption vision scores than built ones (Sample 1:  $F$  17.82 (1,156)  $M_{CV_{natural}}$  3.06 and  $M_{CV_{built}}$  2.84; Sample 2:  $F$  82.35 (1,168)  $M_{CV_{natural}}$  3.25 and  $M_{CV_{built}}$  2.82). To test proposition 5, we also coded the first recalled image as natural or built and found that 78% of first recalled images were natural. Finally, the overlap between the top three images that were preferred, had the highest consumption vision rating and were most frequently recalled were investigated to test proposition 5 (this was undertaken for each sample, see Table 2 and 3). As shown in the tables the first column relates to the image preference ranking based on the mean score (column 2); the third column lists the images ranked by the mean for consumption vision; the last column is a simple rank ordering of the images based on recall. Images ranked highest in these respects all reflect a natural setting (bushwalker, rainforest, sunbathing – sample 1 and beach lookout, Uluru and Uluru – sample 2). The only image that is included in the top three for preference, consumption vision or recall is the firework image. Two out of the three most recalled images were also ranked among the top three in terms of consumption vision in each of the two samples.

*Insert Tables 2 and 3 about here*

To summarise the results, we found that natural images were preferred over built images. In comparison to males, females tended to prefer the shopping and day spa images, whereas males preferred the Australian pub and adventure image (base jumping). Drilling down further into the heat maps gender differences were also identified with males showing more interest in the alcoholic beverage and females showing more interest in jewellery. Respondents could better imagine themselves in a natural environment (e.g. a rainforest or Uluru). In respect of recall, natural images were overwhelmingly recalled compared to built



## Natural and built photographic images

images (sample 2: 78% natural versus 22% built). For specific images rainforest and Uluru were most frequently mentioned.

### **Discussion**

This study was exploratory in testing the role of tourism images for potential consumer interest, preference, consumption vision and recall. This is an important area for study as more tourists are using visual information in search and decision-making, such as that supplied on the Internet when choosing a vacation. The novel use of heat mapping adds an additional dimension to understanding areas of interest that consumers attend to when assessing visual information.

In general, natural images were preferred in both samples. Perhaps like other research (Lidwell et al., 2010) has found that when people have an affinity with nature it offers a range of psychological benefits and conjures up a favourable imagined experience. Our findings are in line with Kaplan et al.'s (1972) seminal research, identifying a similar pattern of preference for natural images over built ones, further demonstrating the extension of earlier environmental psychology research into the more applied tourism domain. This result holds over a sample of tourism photographic images depicting either natural or built environments. One image that had been clearly classified as 'built' was rated highly on the preference scale; this image was one of fireworks shown in a harbour setting. It could be that the combination of a large expanse of the water under a bridge made it appealing. White et al. (2010) found aquatic features are associated with liking, and that urban scenes with aquatic features are as attractive as natural scenes. In line with previous research (Kaplan et al., 1972) our findings indicate moderately complex images were preferred. Similarly, as MacKay and Fesenmaier (1997) suggest, there tends to be a linear relation between preference and complexity, more

## Natural and built photographic images

so for built settings. It is likely that a pleasantly arousing image gives rise to this preference (McQuarrie & Mick, 1992; Phillips & McQuarrie, 2004).

Some gender differences were identified in this study. Females indicated a higher level of preference for shopping and day spa images, whereas males indicated a higher preference for an Australian pub and base jumping. There was also a gender difference in the areas selected as interesting using the heat maps. More men were interested in the beer can and more women were interested in the jewellery depicted in the shopping. While such a finding may appear intuitive, no previous research study has confirmed such gender differences in the photographic components. The implication of this is that more attention by researchers should be made to the components of images as well as the whole.

Past research (e.g. Walters et al., 2007; Lee & Gretzel, 2012) has confirmed the important role of consumption vision in tourism research. However, minimal research has investigated consumption vision ratings of particular images. In the present research, people were most likely to report higher levels of consumption vision in either an entirely natural environment or partially built (fireworks). Like Lee and Gretzel's (2012) study, beach scenes were highly significant in generating mental imagery. In addition, two iconic nature scenes – Uluru and the rainforest – generated strong consumption visions. A similar pattern for natural settings was found when respondents were given an opportunity to recall images. In both samples, recall for the top three images were universally natural. This occurred despite a random allocation of images to each respondent, largely eliminating any recency or primacy effects. Thus, our research extends previous research to show that within a tourism context natural images are more likely to be recalled.

## **Managerial Implications**

## Natural and built photographic images

It is important for tourism marketing professionals to carefully consider the make up of photo images and the target market. Natural settings are definitely preferred to built settings and more complex images are also preferred, particularly for built settings. Destination marketers may need to consider the level of complexity to enhance liking of advertisement images for built environments. As water and iconic feature seem to enhance liking, destinations of a built type may be able to benefit from incorporating more of those elements into promotional materials (e.g., swimming pool, fountains, canals). Males and females attend to specific elements within images differently. Careful testing for preferences of images using both genders is therefore important. Interestingly, the mental imagery associated with consumption vision is more likely to be elicited from natural images than built images. Given that higher levels of consumption vision (mental imagery) are also associated with stronger attitudes (Lee & Gretzel, 2012), provides further evidence of the importance of selecting the appropriate image types by industry personnel. Moreover, recall on images was found to relate strongly to an image containing a predominantly natural setting, thus suggesting the use of natural images in materials such as webpages.

### **Limitations, future research and conclusion**

Like all research, this study had certain limitations. The two samples used in this research are relatively moderate and larger scale surveys are warranted to depict further trends. To some degree, the use of specific photographs can be confounded with either natural/built and/or complexity. A pure measure is difficult to obtain even though classification pre-checking was done for our research stimulus images. Similarly, a wider range of dependent measures may be appropriate. For instance, Laumann, Garling and Stormark (2001) use scales to measure the restorative properties (characterised as stress reducing, positive mood creating) of environments, which could also be applied to tourism. In the current study we apply the term

## Natural and built photographic images

complexity to the images based upon respondents ratings. Two items were used for this classification and future research could consider using more detailed measures of complexity as it appears to be an important variable. This study drew a sample from a Western culture and it could be of interest to compare with samples from other cultures, especially Eastern. For example, the potential for increasing Chinese tourist interest in outbound destinations could make it of interest to study. The present study is limited in that the visual images were presented in an isolated manner whereas, in most cases, other material such as text would normally be associated. Future research could also investigate the pairing of word and/or phrases with the images to gain further insight. Finally, the current research reports on natural and built environments but future research could investigate other aspects such as the angle and image is shot from, predominant colors used or other image factors.

The main contributions of this research are: it has further demonstrated evidence for consumer preference for natural versus built images; it has shown the role of complexity as an association to image type; although the images preferred by males or females differed in anticipated ways, this study goes further by demonstrating that areas of interest are quite different by gender. The role of consumption vision also seems to be enhanced by the more natural images.

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## Appendix A: Items use in the measurement of constructs



Natural and built photographic images

<b>Construct</b>	<b>Source</b>
<b>Environment</b>	Adapted from Kaplan et al., 1972
Totally natural environment (1) to totally built environment (5)	
<b>Preference<sup>a</sup></b>	Adapted from Kaplan et al., 1972
How much do you like this image?	
How exciting do you find the image?	
How fascinating do you find the image?	
How intriguing do you find the image?	
<b>Complexity</b>	Adapted from Kaplan et al., 1972
How complex do you find this image? <sup>a</sup>	
How intricate do you find this image?	
<b>Consumption Vision<sup>b</sup></b>	Adapted from Escalas, 2004
I felt mentally involved in this image.	
I could picture activities happening in this image.	
I could picture myself in this image.	

<sup>a</sup> Items measured on 5 point scale 1 = Not at all to 5 = A great deal; <sup>b</sup> Items measured on 5 point scale 1 = Not at all to 5 = Very much

**Appendix B: Factor Analysis of Nature/Built Images by sample**

<b>Image</b>	<b>Factor Loading: Built <math>\alpha</math> .79</b>	<b>Factor Loading: Nature <math>\alpha</math> .73</b>
<b>Sample 1</b>		
Shopping centre	.84	
Fireworks	.76	
Concert	.75	
Duty free shop	.72	
Sydney Harbour Bridge	.69	
Day spa	.51	
Bushwalker		.79
Surfer		.78
Scuba diving		.70
Rainforest		.67
Sunbathers		.64
Hang gliding		.51
Swim with sharks		.46

Natural and built photographic images

Image	Factor Loading: Built $\alpha$ .77	Factor Loading: Nature $\alpha$ .78
<b>Sample 2</b>		
Fine dining restaurant	.77	
Art gallery	.73	
Theme park	.72	
Base jump	.63	
Australian Pub	.62	
Casino	.61	
Kayaking		.76
Horse riding in bush		.74
Beach lookout		.66
Uluru		.65
Rock climber		.64
Beach walk		.60

**Table 1 Significant results for gender comparison on preference**

Item	t-value	df	p	M Male <sup>a</sup>	M Female <sup>a</sup>
Shopping (B)	2.97	156	.003	2.43	3.08
Day spa (B)	1.98	158	.049	2.69	3.05
Duty free (B)	2.66	158	.009	2.17	2.76
Australian Pub (B)	2.36	169	.020	3.24	2.83
Base jump (B)	3.00	169	.003	3.08	2.55

<sup>a</sup> Preference measured on 5 point scale 1 = Not at all to 5 = A great deal; (B) = Built

**Table 2 Preference, consumption vision (CV), representation and recall Sample 1**

Preference <sup>a</sup>	M	CV <sup>b</sup>	M	% times recalled first
Bushwalker (N)	3.32	Rainforest (N)	3.46	Rainforest (N) 26%
Surfer (N)	3.29	Fireworks (B)	3.42	Sunbathers (N) 9.5%
Fireworks (B)	3.26	Sunbathers (N)	3.36	Surfer (N) 9.5%

<sup>a</sup> Items measured on 5 point scale 1 = Not at all to 5 = A great deal; <sup>b</sup> Items measured on 5

point scale 1 = Not at all to 5 = Very much; (B) = Built and (N) = Natural

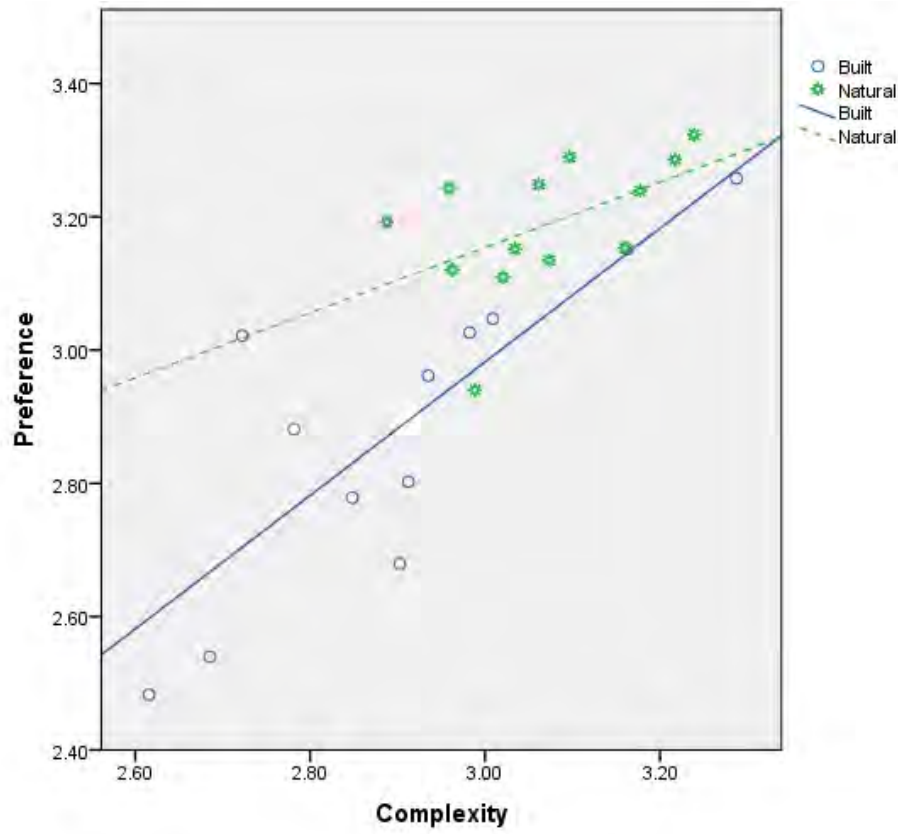
Natural and built photographic images

**Table 3 Preference, consumption vision (CV), representation and recall Sample 2**

<b>Preference<sup>a</sup></b>	<b>M</b>	<b>CV<sup>b</sup></b>	<b>M</b>	<b>% times recalled first</b>
Beach lookout (N)	3.29	Beach lookout (N)	3.54	Uluru (N) 26%
Uluru (N)	3.25	Uluru (N)	3.44	Beach lookout (N) 20%
Beach walk (N)	3.24	Beach walk (N)	3.40	Horse ride (N) 10%

<sup>a</sup> Items measured on 5 point scale 1 = Not at all to 5 = A great deal; <sup>b</sup> Items measured on 5

point scale 1 = Not at all to 5 = Very much; (B) = Built and (N) = Natural



**Figure 1 – Perceptual map of the relationship between preference and complexity means for natural versus built environment**

Natural and built photographic images



**Exhibit 1: Heat map by area of interest - Australian Pub**



**Exhibit 2: Heat map by area of interest - Shopping centre**