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Evolutionary and socio-cultural influences on feelings and attitudes towards nature: a cross-cultural study

Abstract

Mounting environmental issues have prompted reconsideration of the human-nature relationship. Accordingly, attitudes to nature, as an important dimension of human-nature interactions, have become a research focus. In particular, how feelings and attitudes towards nature are influenced by evolutionary and social-cultural constructions, and whether there is variation between different cultural groups, demands more attention. Using a survey of visitors to two very different National Parks, the New Forest National Park, England and Jiuzhaigou National Scenic Area, China, this paper shows that of nationality and past and present living environment，differences between the two nationalities were significant in respect of both attitudes and feelings. Specifically, it demonstrates that the biophilia thesis, which purports that people have an innate, and hence a genetically inherited, need for affiliation with nature is influenced by their socio-cultural environment, in particular their national culture, but also by their current living place. The study contributes to a better understanding of sustainable tourism in natural areas.

Keywords: anthropocentric; ecocentric; biophilia; nature attitude; National Park.

Introduction

The world is facing unprecedented environmental threats at a local, regional, national and global level and therefore a careful consideration of the human-nature relationship is needed (Holden, 2008). The development of policy initiatives at a range of levels is dependent upon the views of peoples of different nationalities and cultures (Xu & Fox, 2014). Similarly the benefits of the natural world accrue to different populations in varying ways and in the case of tourism can be connected to whether a person is a tourist or a member of the host community. As Liu (2003, p. 462) notes, tourism development is a dynamic process that is 'both supply-led and demand-driven'. The successful development of sustainable tourism is therefore dependent upon both parties and their attitudes to the use of nature as a resource, as well as the feelings that they have in nature, which influence their actions. However Liu adds that demand management is often more critical than resource management and hence the views of tourists are sought in this study.

Fredman, Wall-Reinius & Grundén (2012, p. 290) emphasise that "Tourism activity is dependent, enhanced or just contextualised through natural environments" and tourists'

attitudes to nature are therefore important in tourism marketing, management and development. As an example, Xu, Cui, Ballantyne & Packer (2013) argue that because interpretation at a natural attraction can be used to communicate a message that may encourage attitudinal change, information about the visitors including their culture and ways of perceiving the natural environment are needed for this to be the most effective. Natural environments are not only desirable in nature based tourism, such as wildlife tourism and ecotourism but also appeal to mass tourism. This may be due in part to the overwhelming development of urban environments in modern society (Kaplan, 1987).

The popularity of nature in tourism development has led to attention from researchers as to how people view and use the natural environment. Its value to tourists is dependent upon their perception of the environment, which influences their views on the use of its resources (Bruun & Kalland, 1995). Similarly, a person's attitude towards nature influences their attitudes towards environmental issues (Schultz, Shriver, Tabanic & Khazian, 2004). There is accordingly no single way in which the value of the natural environment to tourists is theorised. A prevailing approach is to distinguish between anthropocentrism and ecocentrism. In the former, the natural world is perceived as a resource to be used to benefit mankind whereas ecocentrism values nature for its own sake (Campbell, 1983; Thompson & Barton, 1994; Kortenkamp & Moore, 2001; Page & Connell, 2009; Fennell & Nowaczek, 2010; Xu & Fox, 2014). The anthropocentric attitude dominated western thinking (Holden, 2008) having derived from the Judeo-Christian culture of dominion over nature (Pointing, 1992) and was first identified in the 1860s (Campbell, 1983). Biocentrism was initially recognised in 1913 (Kortenkamp & Moore, 2001) and has developed into ecocentrism, an approach adopted by deep ecologists in the 1970s, in which the intrinsic value of nature is recognised (Page & Dowling, 2002).

Eco-psychologists confirm that nature offers psychological benefits that can make a positive contribution to human wellbeing (Ulrich, 1984; Kaplan, 1995). These benefits may be realised from meeting an innate need for affiliation with nature, that is, the biophilia thesis (Wilson, 1984). Behaviour in response to nature can therefore be explained through biologically inherited feelings and socially constructed attitudes. It has been suggested that different cultural groups may view nature differently (Holden, 2008). For example, Eastern culture supports the unity of man and heaven (Sofield & Li, 2003), whilst the Western Christian belief is of the separation of man and nature. This study therefore uses a cross cultural approach in two countries in which nature tourism is popular, but which have very different cultures in this way, namely the UK and China. Evidence was obtained using surveys of visitors to the New Forest National Park, England and Jiuzhaigou National Scenic Area, China. The UK, a Western Christian society, is a developed country with a wide range of natural landscapes (VisitBritain, 2013). The New Forest National Park in southern England is the most densely-populated national park in England, with over 34,000 residents. Over half of the land is privately owned (New Forest National Park Authority, 2016) and it attracts about 3 million visitors each year (New Forest District Council, 2012).

Whereas, China is not only an Eastern society greatly influenced by Confucianism and Taoism, but also a developing country, experiencing rapid economic development with

associated mass urbanization (Xu & Fox, 2014). Jiuzhaigou National Scenic Area in western China receives about 2.6 million visitors a year (Cheng, Xu & Zhang, 2009). When the National Park was set up, there were about six villages comprising of about 800 residents and there is a policy of gradually reducing this number, through voluntary agreement (UNESCO, 2016). China also responds to the conclusion of Ryan & Huang (2013, p. 313) that "international tourism research will be increasingly enriched by indigenous Chinese knowledge, theories and concepts".

Furthermore, to extend this cross-national study, this research additionally incorporates whether the respondents *currently* live in an urban or rural location to demonstrate the relevance of that influence on their attitude formation and whether their socialisation (that is where they *grew up*) occurred in an urban or rural location and again its influence on their current attitudes. As Hirst (1999, p.110) suggests "the rural is now defined in relation to its opposite, the urban. Rural areas have spatial patterns and social relationships that are not the same as cities".

Whilst many people grow up and live in the same environment for others there is movement from urban to rural or vice versa. In the UK, there have been more people living in urban rather than rural areas since 1851 (Long, 2005) although today there is an increase in the rural population, resulting from an urban migration by people seeking a better life in the countryside (Murdoch, 2006). As Murdoch notes, "increasing affluence, along with changes in transportation systems, has allowed many people to combine country living with urban employment and more people are now moving away from cities than are moving into them" (Murdoch, 2006, p.177).

Whereas, in China, the reverse is happening and since the 1990s the speed of urbanisation has accelerated (Hu, 2013). Rural residents usually live with fellow clan members in villages with a common ancestry (Zhou & Jiang, 2013) and "traditional Chinese customs are still extremely influential in people's lives" (ibid. p. 25). However, as a result of massive urbanization, the urban population exceeded the rural population for the first time in 2011 (National Bureau of Statistics of China, 2012). This is of interest, as in China, more-educated, affluent and urbanised people have more pro-environmental attitudes (Harris, 2006). The complexity of migration, is beyond the scope of this study, but warrants further investigation in the future.

Gender has also been suggested as an important factor in the related context of environmental studies. These studies have examined environmental attitudes, concern, knowledge and actions (Arcury & Christianson, 1993). McKercher, Pang & Prideaux (2011) for example, studied students of different gender and several nationalities. They found that "far greater between-country differences exist in pro-environmental attitudes and attitudes about tourism and the environment than within-country gender differences" (p. 282). For this reason and to avoid greater complexity, gender is not a variable in this study.

In summary therefore, the aim of this research is to address gaps in the understanding of evolutionary and socio-cultural influences on the feelings and attitudes to nature of visitors in protected areas. By doing so, the study:

- clarifies whether the *feelings*, which people have in nature, are universal, disregarding their national culture and past and present living environments.
- demonstrates how visitors' *attitudes* to nature and hence the value of the natural environment to tourists, differ in relation to their national culture and past or present living environments.
- establishes whether national culture or living environment, is the most significant in influencing people's feelings and attitudes.

Literature review

Interactions with nature

Throughout history, there have been different forms of relationships between humanity and nature. Many have been perceived exploitative (Goudie, 2013), including for example the agricultural and industrial development of the modern world or the current global use of resources. Additionally and often overlooked, are the non-instrumental interactions with nature (Phillips & Mighall, 2000). These include for example, the emotional and aesthetic responses to nature that contribute to culture and the arts and these relationships between people and the natural environment are critical in resource management (Xu & Fox, 2014).

There is no single, common attitude to nature. Fredman et al. (2012, p. 292-3) argue that "Ideas about nature vary over time and between different traditions, cultures and individuals since the meanings are reflections of broader contexts". Bramwell and Lane (2013, p. 2) go further and state that people's behaviours "are locked into and reproduce the social practices and institutions that are the basis of social systems". Therefore any understanding of the human-nature nexus and tourism requires not simply an understanding of anthropocentrism and ecocentrism, but also a systematic consideration of the effects of social, structural and cultural influences on people's attitudes and values.

These influences have been found to operate at three different levels by Lippa (2002). He suggests the first level within the social-environment is formed from the social and cultural groups within a person's community; the second is a person's past social environment; and the third is their current social setting.

Evolutionary influences on interactions with nature

Biological and social influences on interactions between people and nature are interwoven; so it can be difficult to distinguish specifically between the two. Some aspects may be attributable, for example, sex is determined biologically and gender is socially

mediated, but others are not. However, distinctions that are increasingly being made in respect to the natural environment are between influences that may be innate and those that are learnt, for example, through enculturation. Considering evolutionary influences first, Wilson (1984) proposed the biophilia hypothesis, that people have a need to affiliate with nature. Evolutionary psychologists argue that humans have evolved in a natural environment (Kaplan, 1992) and consequently people have an innate need for such environments.

Experimental evidence in support of the biophilia hypothesis was provided by a series of conditioning experiments by Öhman (1986). These demonstrated that physiological and emotional responses to natural threats such as snakes and spiders could occur subliminally, despite the participants in the experiments having no conscious recognition of having seen the stimuli before. It was also shown that modern fears, such as of guns, do not invoke similar responses. Other support came from studies on responses to landscapes. Kaplan (1992) reported a meta-study which assessed the results of 30 individual studies into environmental aesthetics. He concluded that respondents reported preferences for natural rather than human-influenced environments with trees and water enhancing that preference. A study on the effects of challenging life events in children revealed that those living closer to nature seemed to be less effected by life stressors (Wells & Evans, 2003), suggesting that natural environments can be valuable in maintaining good health. Nature connectedness (Mayer and Frantz 2004; Howell, Dopko, Passmore & Buro, 2011) has been found to decrease a person's stress symptoms (Szachniewicz, 2013). Thomas (2013) suggests that the need for affiliation may also extend to the digital world (through for example, the use of images of nature as screensavers); a phenomenon she refers to as technobiophilia.

It has been argued, however, that the genetic bond with nature, which developed through our evolutionary relationship with the natural world, may be a weak one (Kellert, 2002), although studies in support of this proposal, do not appear to have been undertaken. Therefore, this study seeks to establish whether the *feelings*, which visitors have in nature, are universal, by considering whether socio-cultural factors have any influence. The literature reviewed hereafter, concentrates specifically on the cultures of Britain and China, being the contexts of this research.

Socio-cultural influences on interactions with nature

Perceptions of nature show considerable differences between the West and East (Sofield & Li, 2007; Wen & Ximing, 2008). A fundamental teaching of Confucianism in China is of the 'unity of man and Heaven' that is man and nature having a similar form (Wen & Ximing 2008), or nature personified. 'Tian Ren He Yi' is a similar view in Taoism; Chuang Tzu (as cited in Wen & Ximing, 2008, p. 574) referred to 'The Way of Heaven'; 'the universe and I came into being together; I and everything therein are one'. This equality of humans and nature differs from the Judeo-Christian tradition of dominion over nature which persists in Britain, being the Bible's most persistent message (Kay, 1989). There are also differences between western and eastern aesthetics (Xu et al., 2013). The Chinese tradition of experiencing nature incorporates learning "the appropriate cultural references attached to scenic spots" (Nyíri, 2006, p. 64), together with a narrative incorporating legends or stories of

famous personalities who are linked to the place. Nyíri adds that tour guides assist in this by highlighting the best views, including those that imitate sounds or shapes, such as the Lute Spring or the Goddess Peak in the Three Gorges. Packer, Ballantyne & Hughes (2014, p. 102) summarise Chinese attitudes to nature as being "influenced by ancient traditions, cultural values, religious and philosophical beliefs".

It is suggested, however, that traditional attitudes to the environment are changing. Harris (2006), for example, argues that the Chinese seek to avoid the poverty and deprivation that have long been a part of their history and that there is a "widespread obsession with wealth creation and material consumption" (ibid. p. 10). China, Roetz (2010, p. 201) notes, is "one of the most ecologically threatened regions of the world" but recognises that unlike many other countries, this was not a result of Western colonisation. It has a history of intense cultivation stretching back over three millennia but in modern times, Western influence through Marxist ideology did affect Chinese relationships with nature, with its credence in nature's subjugation.

In Britain, Phillips & Mighall (2000, p. 369) note, "nature should not be looked on as a singular, static, discrete entity" but nonetheless, some distinctive interactions are recognised. They identify five stages in which different relationships with nature developed:

1）a 'Romantic' concern with places of wild nature;

2）a 'technocratic' concern with creating reserves immune from modernisation and yet accessible for people living in and seeking temporary refuge from modernity;

3) 'ecological' constructions of nature that sought to create spaces for the reproduction of a range of valued natures such as landscapes, natural resources and the flora and fauna of nature;

4）A concern for 'globalised' nature that argued for a unified nature under threat of world-wide change and

5) 'localised' visions of nature under threat from mainstream and increasingly globalised society (ibid. p. 376-377).

It is suggested that modern relationships between humans and nature, are based on an 'Arcadian' image of nature which places its emphasis on a combination of experiencing the beauty of nature, the emotions evoked by nature, and ascribing intrinsic values to nature (Worster, 1985). Keulartz, Van der Windt & Swart (2004), however, in arguing for a shift from a functionalist to a structuralist approach in nature policy, provide a wide-ranging definition of perception of nature. They suggest it is:

> "a three-dimensional concept consisting of (1) cognitive beliefs of what nature is and how natural processes function, (2) normative values about how nature is judged, and (3) expressive aesthetic experiences about the beauty of nature" (Buijs, 2009, p. 419).

These three dimensions combine together to inform people's attitudes to nature, which in this study are represented by two dominant approaches deriving from environmental ethics, namely anthropocentrism and ecocentrism.

Anthropocentrism and ecocentrism

Thompson & Barton (1994, p. 149) discuss cultural influences on attitudes to nature and distinguish between *ecocentrism*, "valuing nature for its own sake" and *anthropocentrism,* "valuing nature because of material or physical benefits it can provide for humans". Anthropocentrics therefore view nature in an instrumental way, perceiving it as a resource available for exploitation to enhance their lives (Godfrey-Smith, 1979). Gaston (2005) suggests that this perception is widespread and is related to several environmental crises. Holden (2008) agrees that anthropocentrism has been predominant in Western culture prior to modern environmentalism. Similarly, both Wen & Ximing (2008) and Ma, Ryan & Bao (2009) confirm that an anthropocentric attitude is also characteristic of Chinese culture.

In contrast, ecocentrics believe that nature should only be used to meet their basic needs (Page & Dowling, 2002) and recognise that economic growth can be beneficial for the environment if development is appropriate and sustainable (Yeoman, 2000). Therefore both anthropocentrics and ecocentrics can value the natural world and support its conservation (Shultz & Zelezny, 1999). However, for an anthropocentric person this is due to the benefits that may be available to people, whereas for an ecocentric person this is because of the intrinsic value of nature.

Previous research undertaken has identified some of the differences between anthropocentrics and ecocentrics. For example, Gobster (1999) showed that ecological aesthetics (as opposed to scenic aesthetics) is associated with an ecocentric attitude. It has also been demonstrated that ecocentrics have a preference for wild landscapes and for cultural landscapes (Kaltenborn & Bjerke, 2002) and prefer land management which supports natural processes (Ribe, 2002). In contrast scenic aesthetics is more based on an anthropocentric attitude (Gobster, 1999) as is a preference for farm environments (Kaltenborn & Bjerke, 2002). Xu & Fox (2014) demonstrated a strong causal relationship between people's attitudes towards nature and tourism; specifically, that people's attitude to sustainable tourism development is significantly influenced by how they view nature.

Several factors have been identified that influence attitudes towards nature and the environment, such as income, education, religion, collective pressure, media coverage and laws and regulations (Rokeach, 1973; Pearce & Turner, 1990; Cairncross, 1991; Gössling, 2002). However, two other factors have been identified as critical; nationality (by Lippa, 2002) and past and present urban/rural living environment. People's different experiences of nature have been shown to influence their attitudes towards it (Hinds & Spark, 2008). Therefore, their living environment whether close or distant to nature, was also selected. Accordingly, these form the focus of this study and a discussion of these variables follows.

Nationality

National culture is an important factor influencing tourists' behaviour (Pizam, 1995), including environmental attitudes and behaviour (Schultz & Zelezny, 1999). It has also been shown to have a significant influence on people's environmental concern (Dunlap & Van Liere, 1984; Schultz, 2001). In their study of environmental attitudes, McKercher et al. (2011) proved differences existed between nationalities and concluded that British women were "least concerned about the threats posed by environmental degradation" (p. 287) whereas female Chinese "were more susceptible to peer group pressure" (ibid.) with regard to changing their behaviour in response to higher energy prices. The Chinese women were amongst the strongest supporters of carbon offset programmes, while the British females were some of the most sceptical. This suggests that nationality will be an influencing factor in forming attitudes to nature.

Socialisation in an urban/rural environment

For today's adults who grew up in a rural area of Britain, a key difference to their urban counterparts would have been their close association with nature (Matthews, Taylor, Sherwood, Tucker & Limb, 2000). Their contemporaries in China, however, would also have been divided by the household registration system by which only urban residents had the advantage of secure employment and the benefits of the state social-welfare scheme, including free medical care (Yan, 2010). The cultural experiences of each of these groups would therefore have been very different.

Retrospective studies demonstrate the importance of developing bonds with nature when growing up, for example Hinds & Sparks (2008) found that in a sample of English undergraduate social science students, those who had rural childhoods reported stronger identification, more positive affective connections and more positive attitudes to the natural environment than those students growing up in urban areas.

Urban/rural living environment

After examining several studies, Tremblay & Dunlap (1977) concluded that the relationship between rural-urban residence and concern with environmental quality was generally ambiguous. Research on environmental problems at a national level rarely found a relationship, whereas those which focused on local environmental problems demonstrated that rural residents always ranked lower in levels of environmental concern than their urban counterparts. This was supported by the subsequent findings, that urban residents are more concerned about the over-exploitation of natural resources (Arcury & Christianson, 1990) and more associated with ecocentrism (Bell, Greene, Fisher & Baum, 2001). From this review of the literature, *working* hypotheses were developed. Namely, that nationality and where a person grew up and where they live now, leads to a measurable difference in their feelings in nature and their attitudes to nature.

Methodology

This study evaluates the role of nationality (British and Chinese) and the influence of growing up and currently living in a rural or urban environment, on feelings in and attitudes towards nature. These attitudes can play an important role in shaping leisure choices (Wolch & Zhang, 2004) and therefore this research was undertaken by means of a survey of visitors to. the New Forest National Park in southern England and Jiuzhaigou National Scenic Area in western China.

The questionnaire included eight items derived from Thompson & Barton (1994), to assess anthropocentric and ecocentric views of nature (for example, 'People ought to try and control nature'; 'People can always repair any damage to the environment') and ten items based on Wilson (1984), measuring respondents feelings in a natural place' (for example 'Natural places are tranquil'). Both used a Likert scale ranging from 1, strongly agree/feel to 5, strongly disagree/not feel. A list of these items can be found in Table 1. Two questions asked first, 'Did you grow up mainly in?' and secondly, 'Do you now live in?' with the options of responses of either a 'rural/country/village environment' or urban/city/town environment' (reported here as 'rural' and 'urban' respectively). At the end of the questionnaire were closed questions, which included gender and nationality.

[Table 1 near here]

Following a pilot study in each country (and subsequent minor adjustments in wording), face to face surveys from a convenience sample of visitors using self-completion questionnaires containing the same questions were undertaken. Six hundred questionnaires were distributed in each park over a period of 5 days and 597 and 408 completed questionnaires were collected in China and in England, respectively. Of these 926 questionnaires were used in this study (544 Chinese and 382 UK nationals). Data was analysed using SPSS version 20.

Data analysis

The objective of this research is to explore the multidimensional relationships of feelings in and attitudes towards nature in regard to several groups (by nationality and living environment). However, as these behavioural responses are complex and cannot be measured directly, latent variables were identified in order to test the relationships concurrently. A structural model could have been proposed and tested as to whether the relationships between latent variables differed between the groups identified. However, the quality of the data did not confidently meet all the assumptions necessary to carry out this form of analysis (see for example, Nunkoo & Ramkissoon, 2012) and therefore, a weaker strategy, was adopted. This consisted of an Exploratory Factor Analysis (EFA), latent variable extraction and the production of latent variable scores, in order to reduce the large number of related variables and produce key latent variables, before they were used in an analysis of variance (ANOVA). The EFA was undertaken using Principal Axis Factoring (also known as principal factors analysis) followed by Varimax rotation, to maximally contrast high and low loading indicators on each factor and no a priori constraints were placed on the number of components to be extracted (Field, 2009). Five items were eliminated (see Table 1) including

four items in the feelings in nature measurement based on Wilson (1984), during the iterations on pragmatic grounds due to the small loading figures, until a version was obtained that was preferable on the basis of parsimony. Whilst it could be argued that this reduces the validity of the measure, we contend that it still 'measures what it is intended to measure' Kent, 2015, p. 33). Three factors emerged, which were labelled biophilic, anthropocentric and ecocentric.

As noted above, nationality was presumed to be the most significant of the independent variables and so the following hypotheses were then developed in relation to the two factors (dependent variables).

- H1: The effect of nationality and where a respondent grew up (and the interaction between the two factors) has a significant influence on biophilic feelings in nature.

- H2: The effect of nationality and where a respondent lives now (and the interaction between the two factors) has a significant influence on biophilic feelings in nature.

- H3: The effect of nationality and where a respondent grew up (and the interaction between the two factors) has a significant influence on anthropocentric attitudes to nature.

- H4: The effect of nationality and where a respondent lives now (and the interaction between the two factors) has a significant influence on anthropocentric attitudes to nature.

- H5: The effect of nationality and where a respondent grew up (and the interaction between the two factors) has a significant influence on ecocentric attitudes to nature.

- H6: The effect of nationality and where a respondent lives now (and the interaction between the two factors) has a significant influence on ecocentric attitudes to nature.

Each variable was then analysed using a 2-way ANOVA to establish whether it, or the interaction with nationality, had a significant effect on the dependent (latent) variables. As the assumptions of ANOVA were not rigorously met Bootstrapped estimates of the parameters of the underlying Regressions were made. This confirmed that the classically estimated parameters were all acceptable.

Results

Nationality was identified in the literature (McKercher et al., 2011) as playing an influential role in environmental attitude formation and accordingly Table 2 uses nationality as a basis to report the respondent profile, showing the urban or rural environments where respondents grew up and now live. There was a slight difference in the samples in respect of gender age between the two nationalities. In the Chinese sample, 59.3% were male, and

predominantly between 26-45 years old (61.5%), whilst in the British sample, 39.1% were male and mainly between 36-55 years old (50.0%).

[Table 2 near here]

Table 3 lists the factor loadings, which as they all exceed 0.5, suggests that the measurement reached the convergent validity at the item level.

[Table 3 near here]

Table 4 shows the results of the 2-way ANOVA for the three factors, biophilic, anthropocentric and ecocentric.

[Table 4 near here]

The only interaction effect which was significant in respect of biophilic feelings was where the combined effect of nationality and live now was greater than the sum of those two variables acting separately (F (1, 792) = 5.162, p = .023). Effect size was calculated using omega sqrt (Field, 2009) and was small (ω^2 = .03). The British mean was the lower of the two nationalities revealing that the British feel that nature is more fascinating, powerful, tranquil etc. than the Chinese. In all other cases, it is only appropriate to interpret the main effect, but as Table 4 shows, there was a statistically significant effect for nationality only, with small effect sizes of the British reporting more biophilic tendencies than the Chinese.

The factor, anthropocentric, revealed no interaction effects. When interpreting the main effects, it is again differences between the nationalities that are statistically significant, with a medium effect size in respect of where respondents grew up and a small effect for the other two variables. In each, the Chinese were more anthropocentric than the British, in their attitudes to nature.

In respect of the factor, ecocentric, nationality was again consistently statistically significant and the Chinese were more ecocentric than the British. Table 5 summarises the outcomes of the hypotheses.

[Table 5 near here]

Discussion

It would be anticipated from the literature on evolutionary psychology that the feelings the respondents had in nature (the Biophilic variable) would be held universally and hence no statistical differences would have emerged in the data. However, there were differences relating to nationality (albeit small) with the British agreeing with more biophilic statements than the Chinese. This suggests that there must be some element of socialisation or enculturation in how people feel (or report how they feel) in natural environments. This provides empirical evidence supporting the work of Kellert (2002) who suggests that the genetic bond with nature may be a weak one. Nevertheless, through comparing two different

cultural groups, our study highlights that people's biophilic feelings towards nature are influenced by culture. Additionally, there was an interaction effect between nationality and where the respondents live now. Therefore the effect of nationality on biophilia differs depending on the level of feeling by respondents living in urban or rural areas, suggesting people's living environment is also a key factor. A further explanation may relate to the differences in economic development between the two countries discussed in the Literature Review. Further investigation is therefore needed to shed more light on the social construction of feelings in nature.

The results in respect of the attitudes to nature, held by the respondents, reveal a polarisation in the views of the British respondents. In terms of both anthropocentrism and ecocentrism, they disagree more highly with the attitudinal statements than their Chinese counterparts and in respect of anthropocentrism there is a medium effect size. This could possibly be explained by the influence of the western environmental movement in the 1970s on some British nationals encouraging ecocentric rather than anthropocentric attitudes. Also Keulartz et al. (2004) argue for a shift from a functionalist to a structuralist approach in nature policy in the UK. Therefore, the two attitudes co-exist depending on an individual's perception of nature. Whereas in China, nature attitudes are influenced by ancient traditions and a collectivist culture (Hofstede, 2001) which may lead to a convergence of attitudes. However, further exploration is needed to confirm this.

Conclusions

This research makes some important contributions. First, it demonstrates that the biophilia thesis of Wilson (1984), that people have an innate, and hence a genetically inherited, need for affiliation with nature is influenced by their socio-cultural environment, in particular their national culture, but also in part with their current living place. This provides empirical evidence in support of Kellert (2002), who has previously questioned the strength of the bond.

Secondly, this research suggests that the differences between attitudes to nature in China and Britain are far greater than an urban or rural living environment. In fact, as Table 5 shows, none of the other factors were influential when tested singularly. These differences between nationalities in respect of anthropocentric and ecocentric attitudes have importance for the tourism industry as Xu & Fox (2014) showed that people's attitude to nature can be used to predict their attitudes regarding the relationship between tourism and the environment and towards sustainable development in a national park context. As the world continues to develop, in those countries with growing populations, demand for land may push more people to move to the urban areas for employment and/or housing which may support the growth of anthropocentrism. However, this may not necessarily influence attitudes to environmental issues as Thompson & Barton (1994) noted that both anthropocentrics and ecocentrics can hold positive views. Furthermore, it may be valuable to recognise that the polarity of views in Britain may make changing attitudes more difficult, whereas this may be less of a problem in China, where they are less diverse.

Finally, the results also show some corroboration of the work of Arcury & Christianson, (1990) in that the interaction effect, with nationality, related to respondents currently living in an urban area. This showed that urban residents felt more biophilic than their rural counterparts.

Compared with previous studies, this research revealed nationality as the most influential factor compared to living environment. Although other studies have reported the influence of the factors on nature/environmental attitudes, few have compared the strength of influence amongst them. This may have important ramifications when policy on environment issues, whether local or global, is being formed and may influence the success or otherwise of policy initiatives.

The research also has implications for the management of natural resources. As the findings suggest that attitudes to nature are socially and culturally constructed, managers should have an on-going awareness of the balance between people and nature, understanding the strength of cultural and social context in shaping people's attitudes towards both nature and conservation during the implementation of sustainability principles. When promoting pro-environmental behaviour, managers should promote nature in a broader context, and provide more opportunities for people to interact with nature.

One of the strengths of this study was that the research was carried out in national parks and therefore in a natural area and so this may have enhanced the accuracy of the responses by the visitors as to their feelings in nature. However, one of the limitations maybe the precision of the level of responses to the attitudes to nature, because of the type of people who choose and are able to visit a national park. Furthermore, there may have been residents living in the New Forest National Park who responded to the survey.

Future studies could therefore expand the research to respondents located in urban areas to test the efficacy of these findings. In view of the predominance of Chinese respondents now living in an urban area, it would also be useful to study the impact of internal migration on their attitudes and feelings. Perhaps also the views of British nationals of Chinese descent in the UK could be evaluated in the light of international migration. Similarly, Britain hosts more students from China than any other non-EU country – almost 90,000 in 2014-15 (Higher Education Statistics Agency Limited, 2016) who might make an informative population to sample. The surveys could also be undertaken in other countries with different cultural heritages, or other patterns of urban/rural migration to broaden understanding. Finally, research could be undertaken to examine the effects on people's attitudes to nature, of specific environmental differences between urban and rural areas, for example in levels of air and water pollution, or of the impacts of agriculture and industry.

References

Arcury, T.A. & Christianson, E.H. (1990). Environmental worldview in response to environmental problems: Kentucky 1984 and 1988 compared. *Environment and Behavior*, 22, 387-407.

Arcury, T.A. & Christianson, E.H. (1993). Rural & urban differences in environmental knowledge and actions. *Journal of Environmental Education,* 25, 19-25.

Bell, P.A., Greene, T.C., Fisher, J.D. & Baum, A. (2001). *Environmental psychology* (5th ed.). Orlando, FL: Harcourt College Publishers.

Bramwell, B. & Lane, B. (2013). Getting from here to there: systems change, behavioural change and sustainable tourism. *Journal of Sustainable Tourism*, 21, 1-4.

Bruun, O. & Kalland, A. (1995). *Asian perceptions of nature: a critical approach*. Richmond: Curzon Press.

Buijs, A.E. (2009). Lay People's Images of Nature: Comprehensive Frameworks of Values, Beliefs, and Value Orientations, *Society & Natural Resources: An International Journal*, 22, 417-432.

Cairncross, F. (1991). *Costing the Earth.* London: Business Books.

Campbell, E. K. (1983). Beyond Anthropocentrism. *Journal of the History and Behavioral Science*, 19, 54-67.

Cheng, S., Xu, F. & Zhang, J. (2009). Comparison of natural tourism planning administration modes between Chinese famous scenic sites and British national parks—taking Chinese Jiuzhaigou scenic sites and British New Forest national park as examples. *Chinese Landscape Architecture*, 7, 43-48.

Clegg, E.S., Kornberger, M. & Pitsis, T.S. (2008). *Managing organisations: an introduction to theory and practice* (2nd ed.). London: Sage Publications.

Dunlap, R. E. & Van Liere, K.D. (1984). Commitment to the dominant social paradigm and concern for environmental quality. *Social Science Quarterly*, 65, 1013-1028.

Fennel D.A. & Nowaczek, P. (2010). Moral and empirical dimensions of human-animal interactions in ecotourism: deepening an otherwise shallow pool of debate. *Journal of Ecotourism,* 9, 239-255.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: Sage Publications.

Fredman, P., Wall-Reinius, S. & Grundén, A. (2012). The Nature of Nature in Nature-based Tourism. *Scandinavian Journal of Hospitality and Tourism*, 12, 289-309.

Gaston, K.J. (2005). Biodiversity and extinction: Species and people. *Progress in Physical Geography*, 29, 239-247.

Gobster, P. H. (1999). An ecological aesthetic for forest landscape management, *Landscape Journal*, 18, 54–64.

Godfrey-Smith, W. (1979). The value of wildness. *Environmental Ethics* 1, 309-319.

Gössling, S. (2002). Human-environmental relations with tourism. *Annals of Tourism Research*. 29, 539-556.

Goudie, A.S. (2013). *The human impact on the natural environment: Past, present, and future* (7th ed.). Hoboken, NJ: John Wiley & Sons

Harris, P.G. (2006). Environmental perspectives and behaviour in China: Synopsis and bibliography. *Environment and behaviour,* 38, 5-21.

Higher Education Statistics Agency Limited. (2016). Top non-EU countries of domicile. Retrieved from: https://www.hesa.ac.uk/free-statistics

Hinds, J. & Sparks, P. (2008). Engaging with the natural environment: The role of affective connection and identity. *Journal of environmental psychology*, 28, 109-120.

Hirst, P. (1999). Can Rutland learn from Jutland? In A. Barnett and R. Scruton (Eds.), *Town and country* (pp. 109-119). London: Vintage.

Hofstede, G. (2001). *Cultures consequences*. (2nd edn.) London: Sage Publications

Holden, A. (2008). *Environment and tourism*. (2nd edn.) London: Routledge

Howell, A.J., Dopko, R.L. Passmore, H.A. & Buro, K. (2011). Nature connectedness: Associations with well-being and mindfulness. *Personality and Individual Differences* 51, 166-171.

Hu, W. (2013). Peripheral environments of tourist attractions: Definition, assessment and Coordination. In: C. Ryan & S. Huang (Eds.). *Tourism in China, Destinations, planning and experiences*（pp. 237-249）Bristol: Channel View Publications.

Kaltenborn, B. P. & Bjerke, T. (2002). Association between environmental value orientations and landscape preferences, *Landscape and Urban Planning*, 59, 1–11.

Kaplan, S. (1987). Aesthetic, Affect, and Cognition. Environmental Preference from an Evolutionary Perspective. *Environment & Behavior,* 19, 3–32.

Kaplan, S. (1992). Environmental preference in a knowledge-seeking, knowledge-using organism. In: J.H. Barkow, L. Cosmides and J. Tooby, (Eds.) *The adapted mind*. (pp. 581-598). Oxford: Oxford University Press.

Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of environmental psychology,* 15, 169-182.

Kay, J. (1989). Human dominion over nature in the Hebrew Bible. *Annals of the Association of American Geographers,* 79, 214-232.

Kellert, S.R. (2002). Experiencing nature: Affective, cognitive, and evaluative development in children. In: P.H. Kahn and S.R. Kellert (Eds.) *Children and nature: Psychological, sociocultural and evolutionary investigations* (pp. 117-151). Cambridge, USA: The MIT Press.

Kent, R. (2015). *Analysing qualitative data.* London: SAGE Publications.

Keulartz , J. Van der Windt, H. & Swart, J. (2004). Concepts of nature as communicative devices: The case of Dutch nature policy. *Environmental values,* 13, 81-99.

Kortenkamp, K.V. & Moore, C.F. (2001). Ecocentrism and anthropocentrism: moral reasoning about ecological commons dilemmas. *Journal of Environmental Psychology* 21, 261-272.

Lippa, R.A. (2002). *Gender, nature, and nurture*. New Jersey: Lawrence Erlbaum Associates.

Liu, Z. (2003). Sustainable tourism development: A critique. *Journal of Sustainable Tourism,* 11, 459-475.

Long, J. (2005). Rural-urban migration and socioeconomic mobility in Victorian Britain. *Journal of Economic History,* 65, 1-35.

Ma, X., Ryan, C. & Bao, J. (2009). Chinese national parks: differences, resource use and tourism product portfolios. *Tourism Management,* 30, 21-30.

Matthews, H., Taylor, M., Sherwood, K, Tucker, F. & Limb, M. (2000). Growing-up in the countryside: children and the rural idyll. *Journal of Rural Studies*, 16, 141-153.

Maude, B. (2011). *Managing cross-cultural communication – principles and practice*. Basingstoke: Palgrave Macmillan.

Mayer, S. F., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology, 24,* 503-515.

McKercher, B., Pang, S.F.H. & Prideaux, B. (2011). Do gender and nationality affect attitudes towards tourism and the environment. *International journal of tourism research*, 13, 266-300.

Murdoch, J. (2006). Networking rurality: emergent complexity in the countryside. In: P. Cloke, T. Marsden and P. Mooney (Eds.) *Handbook of rural studies* (pp. 171-184), London: Sage Publications.

National Bureau of Statistics of China. (2012). *China's Total Population and Structural Changes in 2011*. Retrieved from:
http://www.stats.gov.cn/english/pressrelease/201201/t20120120_72112.html

New Forest District Council. (2012). *Tourism and travel*. Retrieved from: http://www.newforest.gov.uk/index.cfm?articleid=5197.

New Forest National Park Authority. (2016). *Living in the New Forest.* Retrieved from: http://www.newforestnpa.gov.uk/living

Nunkoo, R. & Ramkissoon, H. (2012). Structural equation modelling and regression analysis in tourism research. *Current Issues in Tourism*, 15, 777-802.

Nyíri, P. (2006). *Scenic spots: Chinese tourism, the state, and cultural authority*. Seattle: University of Washington Press.

Öhman, A. (1986). Face the beast and fear the face: animal and social fears as prototypes for evolutionary analysis of emotion. *Psychophysiology,* 23, 123-143.

Packer, J., Ballantyne, R. & Hughes, K. (2014). Chinese and Australian tourists' attitudes to nature, animals and environmental issues: Implications for the design of nature-based tourism experiences. *Tourism Management*, 44, 101-107.

Page, S. & Dowling, R.K. (2002). *Ecotourism.* Harlow: Prentice Hall.

Page, S.J. & Connell, J. (2009). *Tourism: a modern synthesis* (3rd ed.). Andover: South-Western Cengage Learning.

Pearce, D. W. & Turner, R.K. (1990). *Economics of Natural Resources and the Environment*. London: Harvester Wheatsheaf.

Phillips, M. & Mighall, T. (2000). *Society and exploitation through nature*. Harlow: Pearson Education.

Pointing, C. (1992). *A green history of the world*. London: Penguin.

Ribe, R. G. (2002). Is scenic beauty a proxy for acceptable management? The influence of environmental attitudes on landscape perceptions, *Environment and Behavior*, 34, 757–780.

Roetz, H. (2010). On nature and culture in Zhou China. In: M. Elvin, G. Dux & H.U. Vogel (Eds.). *Concepts of Nature: A Chinese-European Cross-cultural Perspective* (pp. 198-219). Leiden, The Netherlands: Koninklijke Brill NV.

Rokeach, M. (1973). *The Nature of Human Value*. New York, NY: Free Press.

Ryan, C. & Huang, S. (2013). Chinese tourism research: An international perspective. In: C. Ryan & S. Huang. *Tourism in China, Destinations, planning and experiences* (pp. 304-315). Bristol: Channel View Publications.

Sarigollu, E. (2009). A cross-country exploration of environmental attitudes. *Environment and behaviour*, 41, 365-386.

Schultz, P. W. (2001). Assessing the structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology*, 21, 1-13.

Schulzt, P. & Zelezny, L. (1999). Values as predictors of environmental attitudes: evidences from consistency across 14 countries. *Journal of Environmental Psychology*, 19, 255-265.

Schultz, P.W., Shriver, C., Tabanic, J.J. & Khazian, A.M. (2004). Implicit connections with nature. *Journal of Environmental Psychology,* 24, 31-42.

Sofield, T.H.B. & Li, F.M.S. (2003). Processes in formulating an ecotourism policy for nature reserves in Yunnan Province, China. In: D.A. Fennell & R.K. Dowling, (Eds.) *Ecotourism Policy & Planning* (pp. 141- 168).Wallingford, Oxon: CAB International.

Sofield, T.H.B. & Li, F.M.S. (2007). China, ecotourism and cultural tourism: Harmony or dissonance? In H. James (Ed.), *Critical issues in ecotourism: confronting the challenges* (pp. 368-385). London: Elsevier.

Szachniewicz, M. (2013). *Mother nurture: Healing stress through nature.* (Unpublished master's thesis)., California State University, CA.

Tayeb, M. (2003). *International management.* Harlow: Prentice Hall.

Thomas, S. (2013). *Technobiophilia: Nature and cyberspace*. London: Bloomsbury.

Thompson, S.C.G. & Barton, M.A. (1994). Ecocentric and anthropocentric attitudes toward the environment. *Journal of Environmental Psychology*, 14, 149-157.

Tremblay, K.R. & Dunlap, R.E. (1977). Rural-urban residence and concern with environmental quality: A replication and extension. *Rural sociology,* 43, 474-491.

Ulrich, R.S. (1984). View through a window may influence recovery from surgery. *Science*, 224, 420-421.

UNESCO. (2016). *Jiuzhaigou Valley Scenic and Historic Interest Area* Retrieved from: http://whc.unesco.org/en/list/637

VisitBritain. (2013). *Countryside.* Retrieved from: http://www.visitbritain.com/en/Things-to-do/Countryside/ .

Wells, N.M. & Evans, G.W., (2003). Nearby Nature: A Buffer of Life Stress among Rural Children. *Environment and Behavior*, 35 (3), 311-330.

Wen, Y. & Ximing, X. (2008). The differences in ecotourism between China and the West. *Current Issues in Tourism*. 11, 567-586.

Wilson, E.O. (1984). *Biophilia.* Cambridge, MA: Harvard University Press.

Wolch, J. & Zhang, J. (2004). Beach recreation, cultural diversity and attitudes toward nature. *Journal of Leisure Research*, 36, 414-443.

Worster, D. (1985). *Nature's economy: A history of ecological ideas.* Cambridge: University Press.

Xu, F. & Fox, D. (2014). Modelling attitudes to nature, tourism and sustainable development in national parks: A survey of visitors in China and the UK. *Tourism Management* 45, 142-158.

Xu, H., Cui, Q., Ballantyne, R. & Packer, J. (2013). Effective environmental interpretation at Chinese natural attractions: the need for an aesthetic approach. *Journal of sustainable tourism*, 21, 117-133.

Yan, Y. (2010).The Chinese path to individualization. *The British journal of sociology*, 61, 489-512.

Yeoman, J. (2000). Achieving sustainable tourism: a paradigmatic perspective. In: M. Robinson, J. Swarbrooke, N. Evans, P. Long & R. Sharpley, (Eds.). *Reflections on international tourism: Environmental management and pathways to sustainable tourism.* (pp. 311-27). Sunderland: Business Education Publishers.

Zhou, Y & Jiang, Y. (2013). A model of mountain region rural tourism development: The case of Suichang. In: C. Ryan & S. Huang. (Eds.) *Tourism in China, Destinations, planning and experiences*. (pp. 22-37). Bristol: Channel View Publications.