

1 **The Connectedness with Nature of Chinese Adolescent**
2 **Tourists: A Q Method Approach**

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63 中国青少年游客的自然关联性：基于 Q 方法的定性分 64 析

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66 **摘要：**对中国青少年游客与自然联系的系统了解，有助于阐释人与自然关系即将
67 发生的文化转向。然而，现有研究大多基于西方文化情境，遵循西方的研究方法，
68 本土文化视域下的自然关联性研究有待深化。有鉴于此，本研究采用 Q 方法，
69 从本土案例思考出发，对西安和深圳市 36 名青少年游客的自然关联性模式进行
70 分析。研究发现，生态自我、对自然的主观感受、对自然的积极体验和对自然的
71 认知信念构成了自然关联性的基本模式。此外，本研究还建立了包含四个连续统
72 的理论框架，以阐明自然关联性的共建过程。上述结论一定程度上充实并完善了
73 自然关联性的概念体系，对目的地管理和环境教育提供了参考借鉴。

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75 **关键词：**自然关联性；青少年游客；连续统；Q 方法

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77 **The Connectedness with Nature of Chinese Adolescent**

78 **Tourists: A Q Method Approach**

79

80 **Abstract**

81 A systematic understanding of Chinese adolescent tourists' connectedness with nature
82 is helpful to illustrate the coming cultural turn in self-nature relationship. However,
83 the existing research is almost based on the Western cultural context and follow the
84 Western approach. Employing the Q method, this study aims to investigate the diverse
85 patterns of CWN from the perspective of 36 adolescent tourists in Xi'an and
86 Shenzhen, China. Our initial findings show four distinct patterns are relevant in the
87 participants' CWN, including individuals' ecological self, subjective feelings about
88 nature, positive experiences with nature, and cognitive beliefs about nature. In
89 addition, a theoretical framework of four underlying continuums is developed to
90 clarify how a complex process of co-construction reveals patterns of CWN. This
91 study offers suggestions for destination management and environmental education.

92 **Keywords:** Connectedness with nature; adolescent tourists; continuums; Q method

1 **1. Introduction**

2 In the long evolutionary process, humans are biologically predisposed to be attracted
3 to nature and to depend on nature (Kellert & Wilson, 1993). However, the inevitable
4 dominance of industrialization and urbanization costs people direct interaction with
5 natural environment (Mayer & Frantz, 2004). Tourism has long been considered as a
6 unique way to physically and psychologically interact with nature. At the heart of
7 tourism is the interaction of people and places (Zhang et al., 2021), thus, the topic of
8 self-nature relationship in tourism is becoming central to our understanding of the
9 factors influencing tourists' behaviour and tourism development (Price et al., 2022;
10 Gao et al., 2018; Coughlan et al., 2022; Restall & Conrad, 2015).

11 The self-nature relationship is evolutionary and innate (Boiral,
12 Heras-Saizarbitoria, & Brotherton, 2019; Wilson, 1984; Restall & Conrad, 2015), and
13 it is also culturally derived (Milfont, 2012; Schultz et al., 2004; Tam, 2013). In recent
14 years, scholars are beginning to recognize that the self-nature relationship is not
15 homogenous and static. The cultural turn of the self-nature relationship in concrete
16 cultural contexts and different periods deserves further attention (Gazzola et al., 2020).
17 For instance, in ancient China, "harmony between man and nature" is considered as
18 an instrument for dealing with conflict and tension. However, during Mao era,
19 pragmatic utilitarianism came to dominate. Yet, after the "opening-up" of China,
20 western ecological thoughts have profoundly influenced the way Chinese view nature
21 (Xu et al., 2014). Each generation's location in history predisposes its members to a
22 certain "habitus", a mode of thought and action, and restricts their range of

1 self-expression to certain pre-defined possibilities throughout their lives (Gilleard,
2 2004). Nowadays, with traditional Chinese philosophical beliefs being fully valued
3 again, huge inter-generational differences between older generations and younger
4 generations appear. As Ryan et al. (2017) stated that “inter-generational differences
5 are possibly greater in China than many other countries” (p. 233), which heralds the
6 emergence of a major transition in self-nature relationship (Gao et al., 2018; Peng et
7 al., 2022). In other words, the coming cultural turn is neatly illustrated by what has
8 happened to the adolescents. Thus, to fully address the dynamic nature of their
9 self-nature relationship has significant importance in tourism and culture research.

10 In this article, we adopt connectedness with nature (CWN) to represent the
11 self-nature relationship. Unlike other concepts about self-nature relationship focusing
12 on components like cognition, affect or behaviour, CWN can be recognized as one
13 kind of self-identity, which emphasizing the evaluative reflection on “self” and
14 “environment” (Brügger et al., 2010). CWN is one part of the way in which people
15 form their self-concept (Tam, 2013); a belief that the nature is important to us and an
16 important part of who we are (Brügger et al., 2010); a kind of consciousness which is
17 associated with the natural environment and contained in the individual’s
18 self-definition (Freed, 2015).

19 Existing studies primarily focused on the conceptualizations of CWN (Zylstra et
20 al., 2014; Liefländer et al., 2013), the explicit and implicit measures of CWN
21 (Brügger et al., 2010; Nisbet et al., 2009; Schultz et al., 2004), and the relationship
22 between CWN and some psychological variables, such as happiness (Martin et al.,

1 2020), pro-conservation behaviours (Price et al., 2022; Martin et al., 2020), greater
2 environmental concern (Schultz, 2001; Schultz & Tabanico, 2007), and physical and
3 mental health (Barrera-Hernández et al., 2020; Haasova et al., 2020). However, few
4 studies have explored the diverse patterns of CWN from the tourist perspective. In
5 other words, the literature does not illustrate “how” and “through what” tourists
6 engender connectedness with nature.

7 It must be noted that nature is largely a social-cultural construction (Atran &
8 Medin, 2008); therefore, CWN is considered to be a constructive, situational, and
9 social awareness of nature (Krettenauer et al., 2020). The vital role of culture is often
10 emphasised when regarding ethics towards nature (Selin, 2013). However, almost all
11 studies are based on the Western cultural context and follow the Western approach.
12 Tourism studies provided limited insights into the dynamic nature of CWN in a
13 specific cultural context like China, given that CWN’s cross-cultural transferability is
14 largely unsupported (Zylstra et al., 2014). For instance, in Western societies, human
15 stewardship of nature in the Judeo-Christian tradition contributes to an
16 anthropocentric perspective of nature (Bourdeau, 2004). Alternatively, harmony is
17 considered the highest principle in China (Xu et al., 2014). Therefore, it is necessary
18 to re-examine the diverse patterns of CWN in Chinese cultural backgrounds where the
19 people, nature and the interactive elements are different from Western countries.

20 In sum, this paper aims to fulfil three sub-dimensional knowledge gaps. First,
21 current analyses of CWN usually centre on its relationship with attitudinal or
22 behavioural variables, which has little bearing on the nature of CWN in tourism

1 context. Therefore, this study seeks to explore the distinct patterns of adolescent
2 tourist's CWN. Second, the previous studies of CWN mainly concentrate on the
3 perspective of multiple groups without focusing on a certain generation. It is
4 necessary to arouse research interest in adolescents' perspective to further explore the
5 cultural turn in self-nature relationship (Barrera-Hernández et al., 2020). Third, in
6 response to the proposition that tourists' behaviour should be measured and described
7 according to local knowledge rather than Western ecological ethics theories, this
8 research renews the fundamental dimensions in Chinese cultural context. Therefore,
9 this research seeks to explore the nature of CWN from the adolescent tourists'
10 perspective through the Q method and build a conceptual framework to explain how
11 adolescents obtain their connectedness with nature. The findings will shed light upon
12 adolescent tourists' CWN construction and practical implications on destination
13 management and environmental education.

14 **2. 2. Literature review**

15 ***2.1. Connectedness with nature***

16 Several concepts about self-nature relationship have been introduced in environmental
17 psychology and tourism, such as “inclusion of nature in self” (Martin & Czellar, 2016;
18 Kleespies et al., 2021), “emotional affinity toward nature” (Müller et al., 2009; Ito et
19 al., 2020), “environmental identity” (Williams & Chawla, 2016), “connectedness to
20 nature” (Mayer et al., 2009; Coughlan et al., 2022), “connectivity with nature”
21 (Dutcher et al., 2007), “commitment to the environment” (Davis et al., 2009), “nature

1 relatedness” (Nisbet et al., 2009; Richardson & Butler, 2022), and “love and care for
2 nature” (Perkins, 2010). These terms describe distinct dimensions, such as emotional,
3 cognitive, or experiential relationships to nature or combinations of these aspects.
4 Nevertheless, there is an obvious overlap in the definition and methodology of these
5 concepts (Fränkel et al., 2019). Therefore, a well-directed concept is needed to
6 comprehensively interpret the self-nature connection. CWN is the ideal concept for
7 this research. Scholars employed a mix of CWN with other terms, such as inclusion of
8 nature in self, connection with nature and connectedness to nature. They attempted to
9 describe CWN according to the emphasis placed on the relative importance of three
10 dimensions of cognition (e.g., perceptions, knowledge, and beliefs about nature)
11 (Schultz, 2001; Liefländer et al., 2013), affect (e.g., emotions towards nature) (Perkins,
12 2010; Bruni et al., 2017), and behaviour (e.g., actions and experience in nature)
13 (Bragg et al., 2013; Nisbet et al., 2009). From the clarification of the descriptions and
14 conceptualizations of CWN and relevant concepts, CWN is supposed to at least have
15 three core structural components—connection (cognitive), caring (affective), and
16 commitment (behavioral) (Schultz, 2002; Balundè et al., 2019). Connection is a
17 cognitive representation of nature; caring is the feeling of closeness and affection in a
18 self-nature relationship; commitment is the strength of one's intention to continue the
19 self-nature relationship. Connection leads to caring, in turn, leads to
20 pro-environmental actions (Schultz, 2002).

21 However, most of the conceptualizations overly focus on these dimensions, and
22 increasing research has called the importance of an expanded self-construct in recent

1 years. We concur with Tam (2013) that CWN and environmental identity are similar.
2 CWN indicates to what extent individuals experience themselves as part of nonhuman
3 natural environment, based on personal history, emotional attachment, and/or
4 similarity (Freed, 2015). CWN is embedded in the broader paradigm of environmental
5 identity, and explores how people rely on identity-based motivations to deal with their
6 attitudes and behaviours toward the natural environment in their daily lives.

7 Although the dimensions are unclear and there is no unanimously recognized
8 measurement tool, CWN's psychological relevance has still received scholarly
9 attention in the recent literature. Empirical evidence demonstrates that CWN is
10 positively correlated with subjective well-being (Martin et al., 2020), happiness
11 (Pasca et al., 2022), and individual responses to a pandemic (Haasova et al., 2020).
12 However, existing studies have too focused on relations between CWN and the
13 social-psychological variables. It is well known that CWN is acknowledged to involve
14 a complex process of social, psychological, and cultural interpretations, however, how
15 CWN is formed is a foundationally significant but still underexplored topic. Therefore,
16 this study addresses this gap in the research by positing a theoretical framework to
17 interpret the construction of CWN from the perspective of adolescent tourists.

18 ***2.2. Chinese view of nature***

19 Regarding the Chinese ethical position on nature, certain cultural traditions, moral
20 values, and philosophical thoughts have deeply affected the way Chinese people view
21 nature (Gao et al., 2018; Xu et al., 2014). Chinese traditional culture contains

1 profound ecological and philosophical thoughts and wisdom. Among the ancient
2 philosophies, Confucianism, Buddhism, and Taoism systematically discussed and
3 interpreted the relation between man and nature. The Confucian doctrine clearly
4 describes this relationship as the “harmony between man and nature” (Ye, 2021).
5 Confucius advocated that benevolence should be applied to all things in the universe.
6 Humans are consciously seen as a part of nature and closely related to other living
7 things; thus, they should obey and respect the law of nature and be responsible for
8 maintaining the sustainable development of all creatures (Jiang & Zhang, 2020). The
9 doctrines and ethics of Buddhism hold that all living things are equal, and humans
10 should not plunder nature as its ruler (Han, 2006). Especially in Tibetan Buddhism,
11 almost every mountain, river, and lake on the Tibet Plateau has a beautiful legend.
12 This practice breeds the religious worship of nature (Jiang & Zhang, 2020). Similarly,
13 Taoism, reflecting an eco-centric view of nature, posits that man and nature are equal
14 but also that nature is ultimately dominant (Packer et al., 2014). In *Dao De Jing*, Lao
15 Tzu advocates that “human beings emulate the earth, the earth emulates the heavens,
16 the heavens emulate way-making [Dao], and the way-making emulates what is
17 spontaneously so” (Chan, 1963, p.153). In sum, the ecological philosophies in China
18 of Confucianism, Buddhism, and Taoism attach great emphasis on living in harmony
19 with the natural world (Gao et al., 2018).

20 However, it is noteworthy that Chinese ecological philosophies are
21 heterogeneous and dynamic. Compared with the long-term environmentally-friendly
22 traditions mentioned above, pragmatic philosophies and utilitarianism seem to be

1 more relevant to Chinese people's daily lives today (Xu et al., 2014). The Chinese
2 view of nature has been labelled as anthropocentrism (Li, 2008), in which the
3 existence of nature and resources is for the benefit of mankind and ultimately used by
4 humans (Harris, 2008). After 1911, the Confucianism, Buddhism, and Taoism
5 philosophies were frequently challenged, and the issues regarding human well-being
6 began to dominate the discourse instead of environmental concerns (Xu et al., 2014).
7 For example, in Maoism, nature is regarded as something to be subdued and
8 conquered (Kobayashi, 2005). After the "opening-up" of China, Western philosophies
9 and concepts (e.g., sustainable development) were introduced to China. The mixture
10 of Chinese traditional ecological beliefs and Western thoughts has created
11 generational gaps in Chinese people's views of nature (Gao et al., 2018). Currently,
12 the establishment of ecological values with the harmonious coexistence of man and
13 nature was proposed by the Chinese central government. Harmony, which is at the
14 centre of traditional ecological culture, has become a common value for the whole
15 society.

16 Although the Chinese view of nature is diverse and flourishing, Western
17 concepts and theories still dominate academic research. However, some researchers
18 don't approve of using Western terms and terminology to describe the relationship
19 between humans and nature in the Chinese context (e.g., Xu et al., 2014; Yang, 2007);
20 thus, a different interpretation of the human-nature relation, rooted in the Chinese
21 culture, is an urgent need in literature.

1 **3. 3. Methodology**

2 ***3.1. The Q-method***

3 The Q method is a mixed-methods approach that combines the mathematical rigor of
4 quantitative methods with the interpretive component of qualitative methods (Robbins
5 & Krueger 2000). This method was developed in the 1930s to explore the
6 construction and sharing of representative perspectives of research participants
7 (Stephenson, 1953). Compared with ordinary factor analysis, the Q method clusters
8 participants instead of variables and analyses an individual's relationship to shared
9 viewpoints among respondents, other than the relationships between the
10 characteristics or notions (Kline, 1994). Initially used in psychology, the Q method
11 has been adopted in human geography, marketing, and risk management (e.g., Watts
12 & Stenner, 2012; Venables, et al., 2009). However, the application of the Q method in
13 tourism studies is still in its infancy, as only a few notable studies have been published
14 (e.g., Huang et al., 2017; Phi et al., 2014; Wijngaarden, 2017; Boom et al., 2021; Shen
15 et al., 2020).

16 The Q method is regarded as an appropriate tool for this research to examine
17 adolescent tourists' subjective opinions of CWN. We conducted the Q study in five
18 steps: developing the Q concourse, selecting participants, sorting the statements,
19 conducting factor analysis, and interpreting the statements.

1 **3.2. Data collection**

2 The first step includes the development of the Q concourse, that is, the perspectives,
3 opinions, and views about a topic. This research first reviewed the literature to
4 identify statements reflecting distinguishing understandings of connectedness with
5 nature (Restall & Conrad, 2015; Mayer & Frantz, 2004; Boiral et al., 2019; Petersen
6 et al., 2019; Schultz, 2001; Perkins, 2010; Dutcher et al., 2007; Nisbet et al., 2009;
7 Davis et al., 2009; Tam, 2013; Schultz et al., 2004). 93 statements concerning
8 connectedness with nature were drafted through the literature review. Subsequently,
9 12 interviews with randomly selected adolescent tourists in Zhongnanshan National
10 Forest Park were conducted from the 7th–16th, November 2021, as sources to develop
11 the Q-sort statements. Data were collected individually, face-to-face with them. The
12 process ceased when no new information could be found, indicating data saturation.
13 This work resulted in an Q concourse of 52 statements. Altogether, this paper defined
14 a list of 145 statements.

15 Prior research indicated that the number of representative statements (Q samples)
16 should be between 20 and 60 (Donner, 2004). To generate a sample of representative
17 statements from the Q concourse, two experts and two postgraduates sorted the
18 statements into subtopics based on a thematic analysis and chose a balanced number
19 for each subtopic. Unclear and repetitive statements were discarded, and general and
20 encompassing statements were replaced by statements that were similar or closely
21 related. The final number of statements was narrowed to 39, falling into eight
22 subtopics: inclusion of nature in the self, emotion development, sameness, willingness,

1 love and care, empathy with nature, commitment to nature, and interests.

2 The second step is P-Set Sampling. This includes the study participants sorting
3 the statements of the Q-set, known as the P-sample. Regarding the participants, this
4 study focuses on adolescent (aged from 10 to 19) tourists. Chinese adolescents have a
5 good knowledge of traditional culture since schools have attached great importance to
6 traditional culture education. In addition, outdoor education is encouraged for school
7 students according to “*The Outline for National Tourism and Leisure (2013-2020)*”
8 and “*Opinions on Promoting Outdoor Education in Primary and Secondary School*”.
9 As a result, adolescent tourists, who have a clear understanding of both traditional
10 culture and nature (Gao et al., 2018), are deemed suitable respondents for this study.
11 Regarding sample size, a large number of participants was not required. Zabala et al.
12 (2018) stated that a sample size of between 26 and 46 was considered acceptable.
13 Therefore, we intentionally picked 36 adolescent tourists according to two selection
14 criteria: cognitive capacities (sorting 39 statements in a relative manner requires a
15 high level of abstract thinking) and availability (the average interview took
16 approximately 40 minutes).

17 The third step in this method is Q Sorting. The interviews were conducted from
18 December 2021 to February 2022 in Zhongnanshan National Forest Park in Xi’an city
19 and OCT National Wetland Park in Shenzhen city. These two locations were selected
20 as data collection sites because Xi’an is a city full of culture and history and Shenzhen
21 is a young modern city. The sample included 18 males (Xi’an 9; Shenzhen 9) and 18
22 females (Xi’an 9; Shenzhen 9) and covered all ages from 10 to 19. Two of the

1 respondents were in primary school, seventeen were in junior high school and
2 seventeen were in high school. All Q-sorts were facilitated during face-to-face
3 sessions by the same researcher. The selected respondents were instructed to express
4 their perspectives on the topic by placing all statements in a column ranging from -4
5 (mostly disagree) to +4 (mostly agree) (see Fig. 1 below). In the sorting process, we
6 engaged in conversation regarding the respondents' views to enable the participants to
7 explain their interpretations of the statements and the reasons for their individual Q
8 sorts. Next, the respondents were asked to complete a demographics questionnaire,
9 including gender, age, educational level, and place of residence. Participants signed
10 consent forms and their responses were audio-recorded and later transcribed to be
11 used in the analysis process.

12 *[Please insert Figure 1 about here]*

13 ***3.3. Analysis and interpretation***

14 Principal Component Analysis (PCA) and Varimax rotation were conducted on the
15 Q-sorts for 36 sorts using PQ Method 2.35 software. Following the recommendation
16 of Vaas et al. (2019), a more iterative selection method was adopted via the resulting
17 factor loadings and the number of significant sorts for different factor solutions.
18 Significant loading is established by employing the formula $ABS(2.58SE) = ABS$
19 $(2.581/\sqrt{N})$. SE is the standard error, which equals to $1/\sqrt{N}$, where N is the number
20 of statements, that is, 39. Therefore, a loading greater than 0.41 or smaller than -0.41
21 is significant ($P < 0.01$) (McKeown & Thomas, 2013). In the process of flagging, the

1 correlation between factor scores was as low as possible. The confounding sorts were
2 not flagged and a minimum of three significantly loading sorts per factor was pursued.
3 We used participants with high and pure loaders of the sorts for member checking, so
4 as to better understand the views of the defined factor.

5 An analyst triangulation strategy was applied in statement interpretation. Along
6 with information from the interviews, high positive and negative statement rankings
7 of z-scores were compared to comprehend each of the factors. Finally, we synthesized
8 all pieces of data into narratives to emphasize the defining elements of the subjective
9 viewpoints.

10 **4. 4. Results**

11 Based on the Q factor analysis, four types of subjective views of Chinese traditional
12 ecological thoughts emerged in this study. The amount of defining loadings per factor
13 determined the number of factors extracted. Thus, a four-factor solution was selected,
14 explaining 51% of the study variance. A total of 31 adolescent tourists (86.1% of the
15 respondents) were significantly associated with one of the four types, while five
16 adolescent tourists were found to have confounding or no significant associations to
17 any type of perspective (see Table 1).

18 *[Please insert Table 1 about here]*

19 Following the recommendation of Brown (1980), we examined the highest and
20 the lowest-ranked statements (array positions of +4, +3, -3, and -4 respectively) in
21 the typical Q sort. We explained the meaning of each statement through its array

1 position and interpreted each perspective through the entire distribution of statements.
2 The perspectives are summarized in the following sections. In the following
3 presentation of the results, the first number inside the brackets is the applicable
4 z-score, which indicates the weighted average of the values given to the statement by
5 the participant, while the second number refers to the array position of a particular
6 statement.

7 ***4.1. Perspective 1 : Ecological self***

8 The first perspective can be summarized as “ecological self” (see Table 2), and held
9 the largest share among the four types of perspectives based on the explained variance
10 of 17%. Regarding educational level, 50% of the tourists were in junior high school. It
11 was found that females were more likely to generate the perspective compared to
12 males (Male 41.7%; Female 58.3%).

13 The sort from twelve respondents emphasized that they are “only a small part of
14 the natural world” (1.75, +4). A connection to nature and the environment, which is a
15 part of their spirituality (1.64, +4), is important to them (1.56, +3). They believed that
16 “humans and the environment are interdependent” (1.56, +3), and thus, “my own
17 well-being can be affected by the well-being of the natural environment” (1.55, +3).
18 This group of tourists was opposed to anthropocentrism as they did not “collect
19 objects from nature” (-1.34, -3) or “watch TV shows that have animals as the main
20 characters” (-1.99, -4), which is regarded as a human-centred activity. In a follow-up
21 interview, a 15-year-old tourist described her viewpoint of nature:

1 emerge. What they focus on are their affective ties with the environment, not
2 behavioural aspects, such as “talking to plants” (-1.73, -4), “collecting objects from
3 nature” (-1.72, -4) and “preferring outdoor to indoor sports” (-1.16, -3). A 14-year-old
4 female respondent described her feelings:

5 *Nature is elegant, like a note; nature is beautiful, like poetry. Just as*
6 *Confucius said: ‘love for living things and people’. I love all kinds of animals,*
7 *blue skies and white clouds, rippling lakes and green mountains. I don't want to*
8 *do anything but enjoy the peace and quiet. I love nature, the mother of mankind.*

9 [Please insert Table 3 about here]

10 This group of participants generally focuses on their emotional bonding with
11 nature, which includes the enjoyment of nature, empathy for environments, and the
12 sense of awe. Echoing Anđić and Šuperina’s (2021) assertion that emotional attitudes
13 toward nature are confirmed to be a prerequisite for better initial education in the field
14 of sustainable development, this study finds that the emotional dimension is an
15 essential part of adolescents’ own views of nature.

16 ***4.3. Perspective III: Positive experiences with nature***

17 The Q-sorts of five respondents define the perspective of “positive experience with
18 nature” (see Table 4). This perspective explained 9% of the total variance, therefore
19 including the third largest group of tourists. Approximately 60% of the participants
20 were males. Participants with higher education levels (60%) were more likely to be
21 found in this category.

1 This perspective is based on the reference point that an individual's experience is
2 essential for the self-nature relationship (Restall & Conrad, 2015; Zabala et al., 2018).
3 According to this perspective, interactions with mountains and rivers can make one
4 happy and smart. This group of tourists "prefer outdoor to indoor sports" (2.09, +4).
5 Furthermore, being in nature (1.31, +3) and listening to the sounds (1.82, +3) of
6 nature brought them joy. Moreover, their connection with the environment is
7 important to them (1.88, +4). For this group of tourists, they find the connectedness
8 through experiences with nature, rather than empathy with nature, such as "I can very
9 easily put myself in the place of the suffering animals and plants" (-1.44, -4), "I feel
10 what the suffering animals and plants are feeling" (-1.32, -3), and "I have tender,
11 concerned feelings for the suffering animals and plants" (-1.11, -3). A 16-year-old
12 male participant said:

13 *Nature makes me relaxed and happy. Whenever I feel sad or nervous, I will*
14 *calm down when I come to nature. Nature gives me a beautiful learning*
15 *environment, which is much more comfortable than studying at home or school,*
16 *and my attention is also highly focused. In addition, the green plants in nature*
17 *can help me prevent vision loss and respiratory diseases.*

18 [Please insert Table 4 about here]

19 Experience in nature, which facilitates a deeper understanding of knowledge
20 learned about nature, is the most insightful factor in realizing CWN, for it can involve
21 "the dissolution of boundaries and a sense of a shared or common essence between
22 the self, nature, and others" (Bratman et al., 2012). This dimension relates to activities

1 in nature, such as entertainment, social activities, sensory stimulation, and motoric
2 development; thus, such activities cultivate the physical and mental stillness (Zylstra
3 et al., 2014).

4 ***4.4. Perspective IV: Cognitive beliefs about nature***

5 “Cognitive beliefs about nature” (see Table 5), as the fourth largest group of
6 adolescent tourists, accounted for 9% of the total variance in the sample. Students in
7 high school were more likely to have this perspective than any other education level.
8 Furthermore, males were more likely to hold this viewpoint than compared to
9 females.

10 For such adolescent tourists, the comprehension of nature indicates cognitive
11 beliefs, which involve “the unnecessary consumption of natural resources by many
12 citizens should be avoided” (1.42, +3), and “being only a small part of the natural
13 world” (1.33, +3). They like listening to the sounds of nature (1.79, +4), can feel what
14 the suffering animals and plants are feeling (1.46, +4), and feel very connected to all
15 living things (1.23, +3). The sense of connectedness originates from cognitive
16 representations, rather than behavioural elements, such as “talking to plants” (-2.35,
17 -4) and “striving to learn a lot about nature” (-1.5, -3). In a follow-up interview, a
18 14-year-old tourist described his feelings:

19 *Nature provides what human beings need. Without nature we cannot*
20 *survive. So, to be friendly to the environment is to be friendly to ourselves. ... I*
21 *can feel the breath of nature, and I belong here. When back in the city, I feel sad*

1 belongings of themselves to nature. This perspective attends one end and emphasis on
2 the sameness between human and nature in wellbeing, importance, and
3 interdependence. The findings indicate that it is possible for individuals to move from
4 small, personal sense of self to a broader, ecological sense of self.

5 The affective—cognitive continuum reflects the connectedness with nature in the
6 relationship between emotion and reason. From the inductive analysis of interviews,
7 we obtained that emotional inclination includes love, care, respect, and affinity
8 towards nature, while and cognitive inclination consists of natural knowledge,
9 environmental awareness, and the concerns about the impact of human behaviour on
10 nature. Some tourists with “subjective feelings about nature” perspective embrace an
11 “affective” connectedness, prizing emotional bonding with nature. Tourists holding
12 “cognitive beliefs about nature” perspective emphasize their worldview and beliefs
13 about their relationship with nature.

14 The contextual — generalizable continuum describes epistemology of the
15 meaning of connectedness with nature. This continuum is based on the literature
16 concerning the meaning of place (Williams, 2014). Material properties of nature
17 provide a platform for personal perception, experience and reflection. Humans are
18 rational planners who choose the best options in a system of socio-physical
19 opportunities and constraints. The instrumental goal of CWN-making may be
20 voluntary, but the practice itself is contingent on the presence of nature. We find that
21 adolescent tourists connect the destination through interaction, which is subjective
22 and contextual. Nevertheless, the relationship between a place feature and the

1 sensation of tourists can be more or less objectively defined and is potentially
2 generalizable across places with similar characteristics.

3 The spiritual—instrumental continuum represents the connectedness with nature
4 related to the functional characteristics of surrounding environments of the destination.
5 The environment contributes to connectedness-making process by shaping tourists’
6 attention, enabling them to engage dialogically with their environments. Adolescents
7 referencing “positive experiences with nature” perspective hold an “instrumental”
8 connectedness, stressing behavioural goals as a source of connectedness. Young
9 tourists with “subjective feelings about nature” perspective emphasize natural
10 environment that allow them to feel the comfort and conduct deeper thinking of the
11 destination as connected to the tourist’s personal values. These two perspectives
12 indicate some young tourists experience psychological rejuvenation in their
13 destination.

14 In summary, the four continuums illuminate how CWN is constructed.
15 Adolescent tourists’ connectedness with nature derives from the interactions between
16 themselves and nature at a specific time and context. Tourists impart connectedness
17 with nature in a variety of ways and for a variety of reasons. Thus, no less than one
18 continuum contributes to the formation process of CWN. The four perspectives
19 illustrate the intertwined combination of CWN attributes in each continuum.

20 ***5.2. Theoretical implications***

21 The main theoretical contribution of this research is a systemic conceptual framework

1 of adolescent tourists' CWN. Although a spectrum of CWN has been explored (e.g.,
2 Restall & Conrad, 2015; Zylstra et al., 2014; Boiral et al., 2019), prior studies have
3 not explained how adolescent tourists engender self-nature connectedness. This
4 framework helps to illustrate the construction of CWN through confirming the
5 complexity and multidimensionality of CWN among adolescent tourists. Four
6 continuums, i.e., self-oriented—nature-oriented, affective—cognitive, contextual—
7 generalizable, and spiritual—instrumental are included in this framework. The
8 framework means balancing the faculties of feelings, beliefs, experiences and the
9 consciousness of “self”. It should be noted that, previous empirical research of CWN
10 primarily focus on usual environment, which mainly comprises three kinds of
11 dimensions, such as emotional, cognitive, or behavioural relationships to nature or
12 combinations of these aspects (Haasova et al., 2020). In contrast to usual environment,
13 Chinese adolescent tourists have four continuums on CWN. These findings shed new
14 light on self-oriented — nature-oriented continuum in tourism context, which
15 illustrates how adolescent tourists interpret the connectedness with nature in
16 relationship to individual characteristic and destination attributes. Tourism can be seen
17 as internal encounters among subjects and place, which affect and interact with each
18 other. These findings are aligned with Chen et al.'s (2017) argument that the
19 consistency of “place-self” is, to some extent, the pursuit and the process of “being
20 given” after tourism experience.

21 This article advances the understanding of the distinct patterns of connectedness
22 between adolescents and nature in the context of combination of tourism and Chinese

1 culture. “Ecological self” perspective holds the largest share among the four types of
2 perspectives, which is similar with Gao et al.’s (2017) argument that younger tourists
3 are generally more self-enhancing than the older ones. Each generation has similar
4 values, beliefs, attitudes and behaviours, which are shaped by major socio-economic
5 events and experience in the early stages of their lives (Inglehart, 2020). Adolescent
6 tourists were born in the first decade of the 21st century and grew up completely in
7 sync with China's ecotourism development. Meanwhile, ecological civilization
8 education is emphasized in their schools. The notion of harmonious symbiosis
9 between human and nature takes root in their mind. The main reason for the
10 prominence of self-consciousness also lies in cultural factors. Previous literature
11 about CWN usually centred on Western context, which usually understate individuals’
12 self-consciousness towards nature. In Western societies, it is believed that God has
13 provided humans the right to dominate nature. Arguably, as a result, human
14 stewardship of nature in the Judeo-Christian tradition contributes to an
15 anthropocentric perspective of nature (Bourdeau, 2004), which partially result in the
16 dichotomy of subject-object in philosophy; thus, there exist a binary thinking on
17 humans and nature. Alternatively, Chinese ethical considerations of nature are
18 impacted by traditional Chinese culture. *Tian ren he yi* (oneness of nature with
19 humans) have a strong influence on Chinese adolescent tourists. Our findings echo
20 He’s (2018) argument that nature is not just an object of study, but is essential to our
21 knowledge of ourselves for Chinese.

22 We should note that in this study, CWN has been confirmed as a part of

1 individual's self-identity. Self-identity can be regarded as one's view of
2 himself/herself when playing a specific or generalized role (Paternoster & Bushway,
3 2009). According to Ryan and Deci (2003), self-identity is acquired over time within a
4 specific social and environmental context. It can be divided into the connectedness
5 between an individual and the natural environment, as well as its influence on one's
6 sense of self. Previous literature about self-nature connection usually understated
7 individuals' self-consciousness towards nature. In this study, we demonstrate that
8 CWN should be understood in a broader context that connects cognition, emotion,
9 experience, and the sense of self to help adolescent tourists better define who they are.
10 In addition, this research also confirmed that CWN is socially constructed, and can be
11 impacted by educational experience. According to Neo-Confucianism, the "self"
12 contains nature, and nature is even seen as an extended body and spiritual home (Shan,
13 2012). Therefore, in this study, we found that for the adolescent tourists, nature is not
14 just an object of study, but is essential to our knowledge of ourselves (He, 2018).

15 ***5.3. Practical implications***

16 Our findings have contributed knowledge regarding identifying and understanding the
17 process of adolescent tourists' CWN construction. Tourist destinations can be the
18 main facilitator of people's CWN, especially after the COVID-19 pandemic. The
19 results of this study have implications for destination management and environmental
20 education. First, our findings suggest that DMOs should carefully examine how
21 tourists derive connectedness with nature from different perspectives. Tourism

1 managers, destination planners, and landscape designers should therefore segment and
2 target tourists with different points of view, and develop advertisement programs that
3 integrate distinct sets of connectedness attributes. Second, because of receding access
4 to quality green and natural spaces, environmental education or outdoor education
5 programs should be provided for adolescents to learn about and experience nature. In
6 addition, access rights, spatial accessibility, and ecological and biological diversity of
7 the environments should be guaranteed to enable students the opportunities for
8 meaningful engagements with nature. Third, the results show that “ecological self”
9 held the largest share in the four types of perspectives. That is to say, Chinese culture
10 has a significant impact on adolescents’ views of nature. Therefore, traditional cultural
11 education, especially ecological philosophy should be prioritised to enhance students’
12 self-development.

13 ***5.4. Limitations and Future Research***

14 This study has several limitations. The data collection took place in Xi’an and
15 Shenzhen as representative cities; therefore, the perspectives collected cannot be
16 considered universal or generalisable. Future studies should replicate the research
17 elsewhere in China and make a comparative study by recruiting participants from
18 other Asian countries, such as Japan and Korea, and African countries to add more
19 insights into the human-nature connection field. The Q method is a qualitative
20 approach, so this study did not test the significance levels of the found perspectives.
21 Exploratory and confirmatory factor analysis could be used to classify the

1 distinguishing statements and develop a CWN scale (Danielson, 2009). The
2 measurement scale could then be further analysed with structural equation modelling
3 to explore the relationships between variables. Therefore, academic perspectives on
4 CWN would certainly benefit from further research on this topic and will also validate
5 and expand the current research findings.

6

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Table 1 Respondents' typology, factor weight, eigenvalue, and variance

Factor	P-sample		Eigenvalue and Variance			
	Gender	Age	Factor weight	Eigenvalue	Variance (%)	Cumulative variance (%)
Factor 1	F	10	0.827	5.562	17	17
	F	13	0.779			
	F	13	0.681			
	F	13	0.573			
	F	15	0.572			
	F	16	0.560			
	F	17	0.633			
	M	10	0.715			
	M	11	0.639			
	M	16	0.532			
	M	17	0.448			
M	18	0.411				
Factor 2	F	11	-0.793	3.185	16	33
	F	13	0.733			
	F	14	0.632			
	F	15	0.574			
	F	15	0.522			
	F	17	0.514			
	M	14	0.693			
	M	16	0.587			
	M	18	0.492			
Factor 3	F	14	0.665	2.071	9	42
	F	14	0.551			
	F	15	0.503			
	M	16	-0.712			
	M	19	-0.610			
Factor 4	F	14	0.650	1.893	9	51
	F	16	0.631			
	M	14	0.763			
	M	17	0.604			
	M	18	0.467			

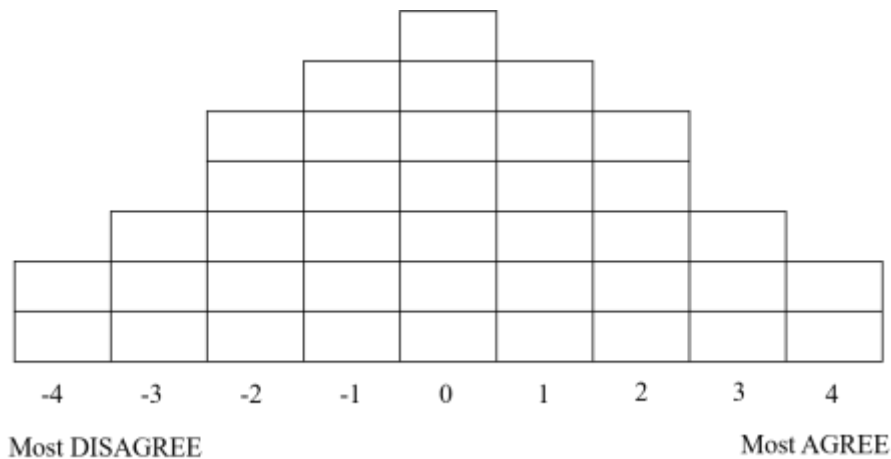


Figure 1 Q Sorting Board

Table 2. Statement Ranking of “Ecological self” Perspective.

No.	Statement	Z Scores	Array Position
Five highest “Most like” statements			
3	I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.	1.75	4
2	My connection to nature and the environment is a part of my spirituality. *	1.64	4
1	Feeling a connection with the environment is important to me.	1.56	3
12	It seems to me that humans and the environment are interdependent.	1.56	3
5	My own well-being can be affected by the well-being of the natural environment.	1.55	3
Five highest “Most unlike” statements			
36	I watch TV shows that have animals as the main characters. *	-1.99	-4
34	I enjoy learning about nature.	-1.69	-4
35	I talk to plants.	-1.54	-3
37	I collect objects from nature such as stones, butterflies, or insects.	-1.34	-3
33	I feel committed to keeping the best interests of the environment in mind.	-1.3	-3

*Distinguishing statements with significance at $p < .05$.

Table 3. Statement Ranking of “Subjective Feelings about Nature” Perspective.

No.	Statement	Z Scores	Array Position
Five highest “Most like” statements			
6	I feel joy just being in nature. *	2.25	4
7	I feel content and somehow at home when I am in unspoilt nature. *	1.88	4
9	It makes me feel good when something happens that benefits the environment. *	1.81	3
12	I often feel emotionally close to nature.	1.57	3
8	I often feel a sense of awe and wonder when I am in unspoilt nature. *	1.54	3
Five highest “Most unlike” statements			
35	I talk to plants.	-1.73	-4
37	I collect objects from nature such as stones, butterflies, or insects.	-1.72	-4
21	It seems to me that humans and the environment are interdependent. *	-1.44	-3
22	I often feel a sense of oneness with the natural world around me.	-1.21	-3
38	I prefer outdoor to indoor sports.	-1.16	-3

*Distinguishing statements with significance at $p < .05$.

Table 4. Statement Ranking of “Positive Experiences with Nature” Perspective.

No.	Statement	Z Scores	Array Position
Five highest “Most like” statements			
38	I prefer outdoor to indoor sports. *	2.09	4
1	Feeling a connection with the environment is important to me.	1.88	4
39	Listening to the sounds of nature makes me relax.	1.82	3
13	I often spend time with animals and plants. *	1.60	3
6	I feel joy just being in nature.	1.31	3
Five highest “Most unlike” statements			
28	I can very easily put myself in the place of the suffering animals and plants. *	-1.44	-4
30	I feel what the suffering animals and plants are feeling.	-1.32	-3
35	I talk to plants.	-1.16	-3
34	I enjoy learning about nature.	-1.16	-3
29	I have tender, concerned feelings for the suffering animals and plants. *	-1.11	-3

*Distinguishing statements with significance at $p < .05$.

Table 5. Statement Ranking of “Cognitive beliefs about nature” Perspective.

No.	Statement	Z Scores	Array Position
Five highest “Most like” statements			
39	Listening to the sounds of nature makes me relax.	1.79	4
30	I feel what the suffering animals and plants are feeling. *	1.46	4
25	The unnecessary consumption of natural resources (e.g., ground, water, air, energy, and so forth) by many citizens should be avoided. *	1.42	3
3	I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.	1.33	3
11	I feel very connected to all living things and the earth.	1.23	3
Five highest “Most unlike” statements			
35	I talk to plants.	-2.35	-4
2	My connection to nature and the environment is a part of my spirituality. *	-1.59	-4
1	Feeling a connection with the environment is important to me. *	-1.51	-3
20	Nowadays, I strive to learn a lot about nature.	-1.5	-3
22	I often feel a sense of oneness with the natural world around me.	-1.4	-3

*Distinguishing statements with significance at $p < .05$.

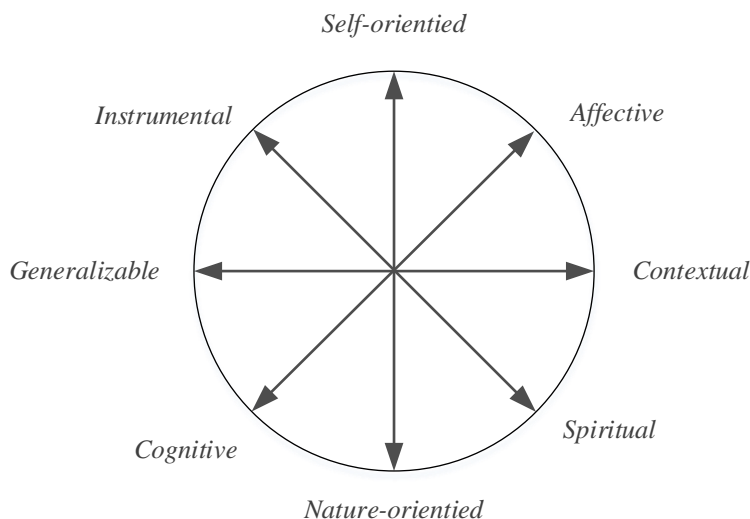


Figure 2 A theoretical framework of connectedness with nature



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