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The Chinese Translation and Back-translation of the Three-dimensional Nature Relatedness Scale

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Abstract

Nature relatedness is the intimate relationship between individuals and nature, manifested as emotional bonding with nature, cognitive integration of nature into one's self, a willingness to experience the allure of nature through physical contact, and a readiness to coexist harmoniously with the natural world. Nature relatedness has become a hot topic in environmental psychology research. In addition to promoting individuals' pro-environmental behaviors, it is also associated with individuals' positive psychological traits and can enhance their mental well-being, reducing stress and psychological issues. Chinese scholars are showing increasing interest in nature relatedness. However, there is a lack of a standardized Chinese version of three-dimensional nature relatedness scale. Therefore, based on the definition of nature relatedness, the research instruments, and analysis of the three-dimensional Nature Relatedness Scale, this study focuses on the translation and back-translation process. It was translated by three Ph.D. scholars proficient in both Chinese and English, followed by back-translation by three Ph.D. scholars who were unfamiliar with the original scale but were skilled in both Chinese and English. Subsequently, under the assessment and guidance of five experts and the original scale's author, modifications were made, resulting in the final Chinese translated version of the Nature Relatedness Scale.

Keywords: Nature Relatedness Scale, Translation, Back-translation, Chinese-translated Version

Introduction

In recent years, nature relatedness has emerged as a focal point in the field of environmental psychology. Previous research, as indicated by studies conducted by Yang, et al. (2017), Li, et al. (2018), and Merino, Valor, and Redondo(2020), has demonstrated that nature relatedness not only encourages pro-environmental behaviors in individuals but also exerts a substantial influence in alleviating psychological symptoms, enhancing happiness, improving cognitive function, and facilitating self-control. Moreover, it contributes to the development of positive psychological traits in individuals, including teamwork (Zelenski, Dopko, & Capaldi, 2015),

creativity (Atchley, Strayer, & Atchley, 2012), aesthetic appreciation (Frumkin, 2001), love (Weinstein et al., 2009), social skills (Wakefield, et al., 2007), self-regulation (Taylor, Kuo, & Sullivan, 2002), enthusiasm (Ryan et al., 2010), and a passion for learning (Benfield , et al., 2015).

Furthermore, some researchers believe that interventions related to nature relatedness, as a form of positive psychological intervention, can enhance people's awareness of the benefits of nature, strengthen their connection with the natural world, promote environmentally conscious behaviors, and ultimately elevate human happiness. Strategies for fostering nature relatedness encompass experiential activities (Nisbet, &Zelenski, 2023), environmental education and cognitive techniques (Tam, Lee, & Chao, 2013; Yang, et al. 2017)). These strategies intervene by either directly encouraging physical interaction between individuals and nature or by modifying people's cognitive perspective regarding the relationship between humanity and the natural world.

In China, researchers' interest in nature relatedness is steadily growing. Yang et al. (2017) reviewed the concept and measurement of nature relatedness and further explored its functions and intervention strategies. Some researchers have investigated the relationship between nature relatedness and other psychological variables. For instance, Wang C.Y. and Wang C.Z. (2018) found a correlation between nature relatedness and self-esteem as well as depressive emotions. In a study by Gan (2023), it was demonstrated that mindfulness affects the life satisfaction of university students, with nature relatedness serving as a mediating factor.

Chen and Huang (2022) investigated the influence of awe on pro-environmental behavior among university students, where nature relatedness served as a mediator and environmental values played a moderating role. Wang, Ji, and Chen (2020) explored the correlation between nature relatedness and the experience of life meaning in university students, with nature appreciation acting as a mediating factor.

Furthermore, other researchers have conducted studies related to interventions in nature relatedness. For example, Passmore, Yang, and Sabine (2022) carried out a study known as the "Nature Noticing Intervention (NNI)." Additionally, Li, Li, and Wu (2018) also conducted a review on the functions and promotion of nature relatedness.

While these researchers have been increasingly discussing nature relatedness, there are still some research gaps, especially in the area of measurement tools. In these studies, a revised version of Tam (2013) was used to adapt the English version of the Connectedness to Nature Scale (Mayer & Frantz, 2004) into Chinese. Chinese scholars Li (2016) also modified the Connectedness to Nature Scale to create a Chinese version, which has demonstrated good reliability and validity. This scale has become the most widely used instrument for measuring nature relatedness among Chinese scholars. However, it's important to note that the Connectedness to Nature Scale is a one-dimensional tool designed to measure the emotional connection between individuals and nature. Despite its widespread use, its single dimension and the controversial nature of the concept can limit its applicability, as it may not fully capture the depth of the connection between individuals and nature (Yang, et al., 2017).

It's worth mentioning that Nisbet, Zelenski, and Murphy (2009) developed the three-dimensional Nature Relatedness Scale based on a three-dimensional definition of nature relatedness, which has demonstrated good reliability and validity. This scale provides a more comprehensive measure of nature relatedness. However, there is currently no standardized Chinese version of the three-dimensional Nature Relatedness Scale.

Therefore, it is of significant practical importance to proceed with the standardization of the Chinese version of the three-dimensional Nature Relatedness Scale. This study focuses on the first step in this process. Under the supervision of the original scale's authors, the translation and back-translation of the scale will be conducted. This lays the foundation for future assessments of the scale's reliability and validity, as well as potential adaptations of the three-dimensional Nature Relatedness Scale for the Chinese population.

Nature and Nature Relatedness

Nature

In this research, the term “nature” refers to the natural environment and the various natural elements encountered by individuals in their everyday lives. The natural environment encompasses both untouched natural landscapes, such as forests, as well as human-made environments that incorporate natural elements, like urban parks. Natural elements include the diverse components of the natural environment, such as plants, animals, rivers, sand, and air (Mcsweeney, etal., 2014; Chen, 2018). Nature relatedness is divided into objective nature relatedness and subjective nature relatedness.

The objective nature relatedness is influenced by the specific environment and reflects the current state of interaction with nature (Chen, 2018). Some evidence supports the claim that spending time in nature provides a range of positive physical, psychological and social health benefits (Ohtsuka et al., 1998; Cimprich & Ronis, 2001; Wu & Lanier, 2003; Loeffler, 2004; Wichrowski et al., 2005; Boniface, 2006; Berman et al., 2008; Park et al., 2010; van den Berg and Custers, 2011). These health-promoting properties are purportedly linked to humans' adaptive connection to nature. During the course of evolution, outdoor environments provided humans with food, security and a place of restoration, which resulted in positive physiological and psychological benefits (Ulrich, 1983; Kellert and Wilson, 1993; Lorh and Pearson-Mims, 2000). The counterpart of objective nature relatedness is subjective nature relatedness (Chen, 2018). Subjective nature relatedness encompasses individuals’ subjective perception of their personal connection with nature, which can vary in terms of cognition, emotion, and behavior. In our everyday observations, we can witness individuals who possess a heightened awareness of their natural surroundings, actively engage in field trips or enjoy indoor gardening. On the other hand, there are those who demonstrate little interest in such activities. The nature relatedness discussed in this research pertains to the perceived relationship individuals have with nature, thus falling within the realm of subjective nature relatedness.

Conceptual Definition of the Nature Relatedness

Different researchers named nature relatedness differently according to different research focuses. Based on previous studies, it was found that more than 13 kinds of nouns were used. Overall, Nature relatedness, alternatively refer to as Nature Relatedness, Connectedness to Nature, Nature Connectedness, Connectivity with Nature, and other terms, represents the essence of the connection between humans and the natural world. Academically, researchers hold varying perspectives on the concept of nature relatedness, reflecting diverse interpretations of this fundamental relationship. Specific references are as follows:

Some researchers emphasize the emotional relationship between the individual and nature. They study the nature relatedness from the perspective of emotion to explain the relationship between human and nature. The earliest environmental psychologist, define nature relatedness as the emotional attachment to nature, including the individual’s love for

nature and the sense of freedom, intimacy and identity in the natural environment. Kals, Schumacher and Montada (1999) are the first to discuss the concept of nature relatedness and put forward Emotional Affinity Toward Nature. They believe that nature relatedness is the emotional affinity of people to nature, which is a kind of love and closeness to nature. Feeling the affinity of nature, the emotional tendency to integrate with nature, emphasizing the emotional connection with nature. Mayer and Frantz (2004) also propose nature relatedness on the basis of emotion, which refers to the degree to which people feel emotionally and empirically connected with nature and feel belonging to nature. Schultz (2002) understand the relationship between human and nature from the perspective of cognition, and believe that the connection with nature refers to individuals' knowledge of the relationship between human and nature, and their awareness of the importance of this relationship. They believe that nature relatedness is the inclusion of nature in the Self, which refers to the extent to which nature is included in the self-cognitive representation.

Nisbet, Zelenski, and Murphy (2009) understand nature relatedness from multiple dimensions. They redefine and believe that natural relatedness is a multi-dimensional psychological structure with cognitive, emotional and behavioral experience. These include knowledge of nature, views of the world related to nature, familiarity with nature, comfort with nature and desire for nature. This concept more fully expounds the conceptual connotation of connecting with nature. In this research, the researchers adopted the definition of nature relatedness provided by Nisbet, Zelenski, and Murphy (2009) and conducted the translation and back-translation of their three-dimensional Nature Relatedness Scale.

Operational definition of the Nature Relatedness

In this research, nature relatedness refers to the intimate relationship between human and nature, where individuals emotionally connect with nature, cognitively integrate nature with themselves, experience the attraction of nature through physical encounters, and are willing to coexist with nature. Nature relatedness has a three-dimensional structure comprising cognition, emotion, and behavioral experience.

The Nature Relatedness Scale can be used to comprehensively measure the level of individual nature relatedness. Higher scores on the scale indicate a higher level of nature relatedness, reflecting a greater degree of recognition of nature, increased awareness of the impact of human behavior on nature, stronger attraction to nature, and a greater willingness to engage with nature.

The Measurement of Nature Relatedness

Previous Research on the Research Instruments

Researchers have developed different measurement tools based on various concepts of nature relatedness, as clearly shown in Table 1.

Table 1
Comparison of the Definition and Measurement of Nature Relatedness

The type of Nature Relatedness	Serial Number	The name of the measuring tool	Number of items and scoring	Dimensions of measurement	Method of measurement	Author and Year
Nature Relatedness of Emotional Type	1	Emotional Affinity toward Nature Scale, EANS	16 items, 7 -point scoring	Single dimension	self-report	Kals, Schumacher &Montada,1999
	2	Connectedness to Nature Scale, CNS	14 items, 5-point scoring	Single dimension	self-report	Mayer & Frantz, 2004
	3	Love and Care for Nature Scale, LCNS	15 items, 7-point scoring	Single dimension	self-report	Perkins, 2010
	4	Commitment to Nature Scale, CONS	11 items, 9-point scoring	two-dimension	self-report	Davis , Green & Reed,2009
	5	Dispositional Empathy with Nature Scale, DENS	14 items, 5-point scoring	Single dimension	self-report	Tam, 2013
Nature Relatedness of Cognitive Type	6	Inclusion of Nature in the Self Scale, INSS	1 item, 7-point scoring	Single dimension	self-report	Schultz,2001
	7	Implicit Association test, IAT	IAT	Single dimension	IAT	Schultz, Shriver, Tabanico&Khazian, 2004
	8	Connectivity with Nature Scale, CWNS	4 items, 5-point scoring , and 1 graphical multiple choice item	Single dimension	self-report	Dutcher, Finleyi, Luloff & Johnson, 2007
	9	Disposition to Connect with Nature Scale, DCN	Rating 50 behaviors, 5-point scoring	Single dimension	self-report	Brugger, Kaiser & Roczen, 2011
Nature Relatedness of Multidimensional relationship Type	10	Environmental Identity Scale, EID	28 items, 5-point scoring	three-dimension	self-report	Clayton&Opotow, 2003
	11	Nature Relatedness Scale, NRS	21 items,5-point scoring	three-dimension	self-report	Nisbet,Zelenski,Murph, 2009

12	NRS-6	6 items,5-point scoring	two-dimension	self-report	Nisbet & Zelenski, 2013
13	Emotional Connection to Nature Scale,ECNS	20 items, 5-point scoring	three-dimension	self-report	Silvas,2013

Table 1 provides a summary and description of different types of measurements for nature relatedness and their characteristics. Based on the information organized in the table, we can analyze and summarize the following aspects:

1. Nature Relatedness Types

(1) Emotional Type: Measures emotional affinity, connectedness, love, care, and empathy towards nature. (2) Cognitive Type: Measures the inclusion of nature in self-concept, implicit connections, connectivity, and disposition to connect with nature.(3) Multidimensional Relationship Type: Measures environmental identity and nature relatedness across cognitive, emotional, and experiential dimensions.

2. Measuring Tools

(1) Each nature relatedness type has specific scales to measure its dimensions, such as Emotional Affinity toward Nature Scale, Connectedness to Nature Scale, Love and Care for Nature Scale, etc. (2) The number of items, scoring methods (e.g., 5-point or 7-point scoring), and dimensions vary across different scales.

3. Method of Measurement

(1) Self-report: Most measures rely on individuals' self-assessment through questionnaires. (2) Implicit Association Test (IAT): Measures implicit connections with nature. (3) Rating of Behaviors: Evaluates individuals' attitudes and activities related to nature.

4. Dimensions of Measurement

(1) Single Dimension: Some measures focus on one specific dimension, such as emotional affinity or inclusion of nature in self. (2) Two Dimensions: Certain measures, like Commitment to Nature Scale, assess psychological attachment and value orientation as separate dimensions. (3) Three Dimensions: Measures like Environmental Identity Scale and Nature Relatedness Scale assess cognitive, emotional, and experiential connections with nature.

In summary, the nature relatedness measures capture individuals' emotional, cognitive, and multidimensional relationships with nature. The scales vary in terms of their focus, dimensions, scoring methods, and the nature-related aspects they assess. These measures provide valuable tools for assessing individuals' affinity, connectedness, and identity with nature, contributing to the understanding of human-nature relationships.

Nature Relatedness Scale

This study employed the Nature Relatedness Scale developed by Nisbet, Zelenski and Murphy (2009), which includes three dimensions: NR-self, NR-perspective, and NR-experience, with a total of 21 items rated on a 5-point scale. There are eight reverse-scored items on this scale, which comprehensively measure individuals' relationship with nature. The internal consistency reliability of the entire scale is 0.87, and the reliabilities of the three subscales are 0.84, 0.66 and 0.80, respectively. The test-retest reliability after a 6-8 week interval is 0.85, indicating good reliability. The scale is effective in predicting environmental behavior and

well-being, demonstrating good validity. Subsequently, Nisbet and Zelenski (2013) selected six items from the original 21 items (four from the self subscale and two from the experience subscale) to create a short version of the scale (NR-6), which does not include any reverse-scored items. The reliability and validity of NR-6 are also satisfactory. Since this study aims to comprehensively measure nature relatedness, the 21-item version from 2009 was used. The scale has been widely used in English-speaking countries, and in China, some researchers have translated and used parts of the scale without following standardized procedures for psychological measurement. Therefore, it is necessary to revise and validate the Chinese version of the Nature relatedness Scale, which was conducted under the guidance of the original scale author Nisbet.

Table 2 displays the 5-point Likert scale for all items in the Nature Relatedness Scale tool, including reverse-scored items.

Table 2
Likert Scale For Nature Relatedness Scale Items

Likert Scale	Disagree strongly	Disagree little	aNeither Agree or disagree	Agree a little	Agree strongly
Nature Relatedness Scale Items: 1,4,5,6,7,8,9,12,16,17, 19,20,21	1	2	3	4	5
Reverse Score Item: 2, 3, 10, 11, 13, 14, 15, 18	5	4	3	2	1

Note. From The Nature relatedness Scale: Linking individuals' connection with nature to environmental concern and behaviour.(Nisbet, Zelenski & Murphy, 2009).

Furthermore, Nature Relatedness Scale can measure three types of NR-self，NR-perspective, NR-experience. The arrangement of items in Nature relatedness Scale instrument is listed in Table 3.

Table 3
Items in the Nature Relatedness Scale/Subscales

Nature relatedness Scale scale/subscales	Items	Number of Items
NR-self	5, 7, 8, 12, 14, 16, 17, 21	8
NR-perspective	2, 3, 11, 15, 18, 19, 20	7
NR-experience	1, 4, 6, 9, 10, 13	6
	Total Nature Relatedness	21

Note. From The Nature relatedness Scale: Linking individuals' connection with nature to environmental concern and behaviour. (Nisbet, Zelenski & Murphy, 2009).

Translation and Back-translation of the Nature Relatedness Scale

As there is currently no standardized Chinese version of the Nature Relatedness Scale, revision work was carried out on the Chinese version first. The researcher emailed Nisbet, the creator of the Nature Relatedness Scale, to request her permission and assistance in

translating and back-translating the Chinese version of the scale and revising it into a standardized form. The specific steps were as follows:

Based on Tam's (2013) suggestion, this research selected the 21-item Nature Relatedness Scale developed, which is frequently used in foreign literature, for Chinese revision and validity testing. As the first step in the standardization of the Chinese version of the scale, it is crucial and fundamental to conduct the translation and back-translation work under the supervision of the original authors.

Translation

In order to adapt to Chinese culture and considering language as a potential issue, the researchers translated the Nature Relatedness Scale into Chinese. The translation was based on the back-translation technique proposed by Brislin (1970). According to Brislin, translating research tools in cross-cultural studies is not easy. Translation means converting ideas and concepts from one language to another, whether orally or in writing, without changing the interpretive process to avoid different connotations. Brislin suggested that translation should be carried out in five levels. Firstly, translating the research tool. Secondly, having people who do not understand the tool to perform back-translation. Thirdly, evaluating the accuracy of the translated tool and the back-translated tool, as well as the consistency with the original research tool. In this study, the entire process was supervised by relevant experts and Nisbet, the creator of the original scale.

The accuracy of the translation was validated using a three-point Likert scale from 1 to 3, as shown in Table 4. In addition, experts provided suggestions to revise items that were found to be inaccurate in the translation.

Following the previously mentioned process, the researchers initially engaged three Ph.D. experts proficient in both Chinese and English to perform the initial translation of the scale. They held group discussions to address any ambiguous items and ultimately confirmed the initial translation draft. Subsequently, an additional three Ph.D. experts, who were fluent in both Chinese and English but were unfamiliar with the scale, were invited to conduct the back-translation, resulting in a back-translation draft. Finally, experts were invited to evaluate the initial translation draft.

Table 4
Scales for Evaluating the Accuracy of Nature Relatedness Scale Translation

Item	Scale/Score
Very Accurate	3
Accurate	2
Inaccurate	1

Based on these criteria, items that were translated very accurately received 3 points, items that were accurately translated received 2 points, and items that were inaccurately translated by experts received 1 point each. The results of translation accuracy were presented using descriptive methods. Table 5 shows the results of six experts' assessment of the translation accuracy of the Nature Relatedness Scale.

Table 5
The Distribution of Specialist Responses to Nature relatedness Scale Translated Version by Area of Expertise

Institution	Area of Expertise	Bill
Universiti Sains Malaysia (USM)	Psychology	2
Universiti Sains Malaysia (USM)	Counseling	1
Beijing University of Aeronautics and Astronautics(BUAA)	Psychological Measurement	1
Universiti Sains Malaysia (USM)	English Language	1
Universiti Sains Malaysia (USM)	Chinese Language	1
Total		6

Table 6 shows that 13 items (61.9%) in the list were responded by the six experts as "very accurate" in their translations. 5 items (23.8%) were responded as "accurate" in their translations, while 3 items (14.3%) were responded as "not very accurate" in their translations. In other words, the translated version validated by experts in Table 6 indicates that the 13 items listed are very accurate and acceptable without further modification.

Table 6
The Results of the Translation Accuracy on Nature relatedness Scale Items According to the Number of Raters(Specialists)

Nature relatedness Scale Translation	Number of Item (%)	List of Items	Number of Rater (Specialist)
Very Accurate	13(61.9%)	2,3,4,5,6,7,8,12,13,15,18,19,20	6
Accurate	5(23.8%)	9,10,11,14,16	6
Inaccurate	3(14.3%)	1,17,21	6
Total	21(100%)		

On the one hand, five items (23.8%) in the 21-item tool were rated as basically accurate by the six experts and needed adjustments. The inaccuracies pointed out by the experts in items 9, 10, 11, 14, and 16 have been corrected by the researchers, as shown in Table 7.

Table 7
Revision on Translated Chinese Version of Nature relatedness Scale Items According to Feedback from Raters (Specialists)

Item	Original English Version cum Translated Chinese Version	Revision on the Translated Chinese Version
9	*I take notice of wildlife wherever I am.* *(**无**论身处何地，我都会关注野生动物)*	*(**无**论身处何地，我都会留意野生动物)*
10	I don't often go out in nature. *(**我不**经常去进行户外活动)*	*(**我不**经常到大自然中去。)*
11	Nothing I do will change problems in other places on the planet. *(**无**论我怎么做都不能改变环境问题)*	*(**我做什么都不能改**变地球上其他地方的环境问题。)*
14	My feelings about nature do not affect how I live my life. *(**我**对自然的看法不会影响我的生活方式。)*	*(**我**对大自然的感受不影响我怎样生活。)*
16	Even in the middle of the city, I notice nature around me. *(**即使在城市中心，我也会关注身**边的自然环境。)*	*(**即使在城市中心，我也会留意身**边的自然环境。)*
1	I enjoy being outdoors, even in unpleasant weather. (***即使在糟糕的天气里，我也喜**欢户外*)	(***即使在糟糕的天气里，我也喜**欢户外运动。*)
17	My relationship to nature is an important part of who I am. (***我与自然的关系是自我中的重要部分。***)	(***我与自然的关系是自我**认知中的重要部分。*)
21	I feel very connected to all living things and the earth. *(**我感**觉自己与所有的生物体和地球都有紧密联结。)*	*(**我感**觉自己与所有的生物和地球都有紧密的联系。)*

On the other hand, there were 3 items (14.3%) which some experts responded as "inaccurate" in translation. Among them, 2 experts responded that item 1 and item 17 were "inaccurate", and 1 expert responded that item 21 was "inaccurate". The inaccuracies in items 1, 17 and 21 pointed out by the experts have been corrected by the researchers, as shown in Table 8.

Back-translation

After completing the revisions mentioned above, the next step was to back-translate the entire Chinese version of the Nature Relatedness Scale into English. The back-translation was performed by another language expert who is proficient in both English and Chinese but is not familiar with the tool. Finally, after completing all necessary steps, the translated Chinese

version of the Nature relatedness Scale and the back-translated English version were sent to the original author for validation as requested. The original author Nisbet's feedback emphasized several items in the back-translated Nature relatedness Scale that needed to be revised again, which the researchers revised based on the comments summarized by experts in Table 8 and these revised items were listed in Table 8.

The above is the final draft of the literal translation work of the scale, which has been evaluated and revised by experts. Subsequently, the scale will undergo back-translation work according to the method proposed by Brislin (1970).

Back-translation and literal translation are two different translation processes, differing in their purposes and methods. Back-translation involves translating a previously translated text back into the original language. In the back-translation process, a different translator, separate from the original translator, is typically employed to perform the reverse translation in order to assess the accuracy and consistency of the translation. The purpose of back-translation is to validate the quality of the translation, ensuring that the translated version aligns with the original text without significant deviations in important information or meaning. The results of back-translation can be compared to the original text to identify any potential issues, errors, or differences in meaning, allowing for further improvements and adjustments to the translation. Back-translation is a commonly used and reliable validation method in the localization and cross-cultural research of scales (Brislin, 1970; Edunov, Auli & Grangier, 2018). Through the process of back-translation, we can further refine the previous literal translation work, resulting in an improved translation version for use.

Table 8 clearly shows that each item has been revised accordingly based on suggestions from experts and the original author (see underlined phrases). The revised back-translated English version and the revised Chinese translation version were sent to the original author for a second round of validation. Finally, the author of the scale granted permission via email and approved the final Chinese translated version of the "Nature Relatedness Scale" prepared by the researchers in this study.

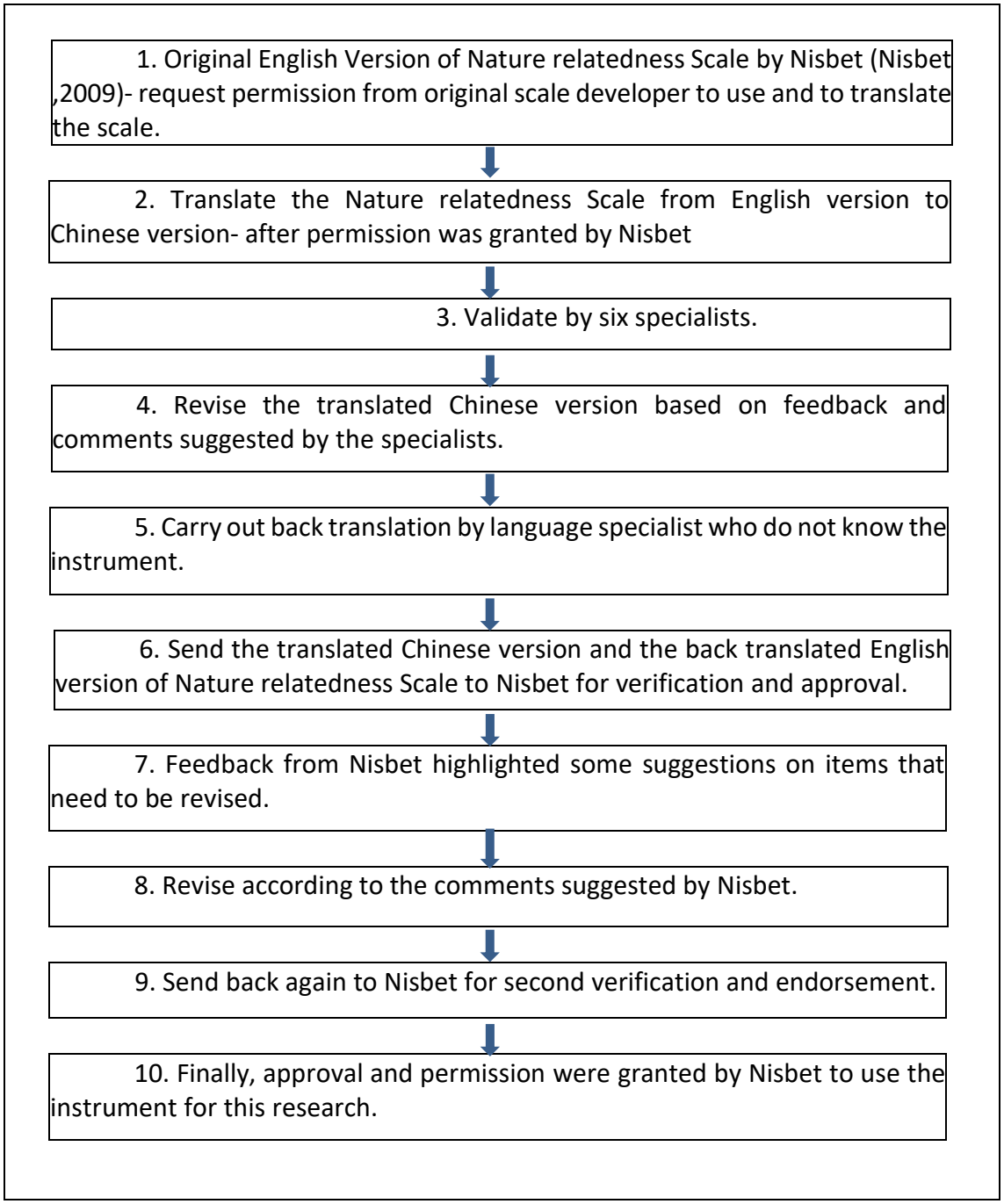
Table 8
Revision on Back Translated Nature relatedness Scale Items According to Feedbacks from the Original Author of the Scale

Item	Original Version	Back Translated Version (English) and Translated Version (Chinese)	Nisbe Suggestions highlighted by	Revised Back Translated Version (English) and Revised Translated Version (Chinese)
1	I enjoy being outdoors, even in unpleasant weather.	I enjoy outdoor activities even in bad weather. (***即使在糟糕的天气里，我也***喜欢户外运动。)	There may be a subtle difference here, from the original in that activities means "doing" something, versus simply being outdoors. For example, one could be sitting which is not really an activity (or maybe some people would consider that to qualify as "activity"?) I think the goal here is to capture how people may be willing to be outdoors or not, when the weather might be less than ideal, but it doesn't necessarily involve a specific "activity".	I enjoy being outdoors, even in unpleasant weather. (***我喜***欢待在户外，即使在令人不愉快的天气。)
17	My relationship to nature is an important part of who I am.	My relationship with nature is an important part of my self-awareness. (***我与自然的关系是自我***认知中的重要部分。)	Perhaps in your language the meaning is different, but to me self-awareness is not the same as identity (who we are). Being aware of one's self is not quite the same as the concept of self identity or just the self. This is not a huge distinction but perhaps may need adjustment, depending on what the translation means in your language.	My relationship to nature is an important part of who I am. (***我与自然的关系是"我是***谁***"的重要***组成部分。)
21	I feel very connected to all living things and the earth.	I feel a close connection to all living beings and the earth. (***我感***觉自己与所有的生物和地球都有紧密的联系。)	I am not sure how this comes across in your language but "being" to me implies something different than living things. I would think of a plant as a living thing, for example, whereas "beings" makes me think of only people or animals. Is that the same in your language?	I feel a very close connection to all living things and the earth. (***我感***觉与所有生物和地球都有着密切的联系。)

The entire translation and approval process of the Nature Relatedness Scale is summarized in Figure 1.

Figure 1

Summary of Approval and Translation Process on Nature relatedness Scale by Specialists and Original Scale Developer Nisbet



The Example of Nisbet's comments on translation and back-translation of the Nature Relatedness Scale is illustrated in Figure 2.

Figure 2

Example of Nisbet's comments on translation and back-translation of the Nature Relatedness Scale.

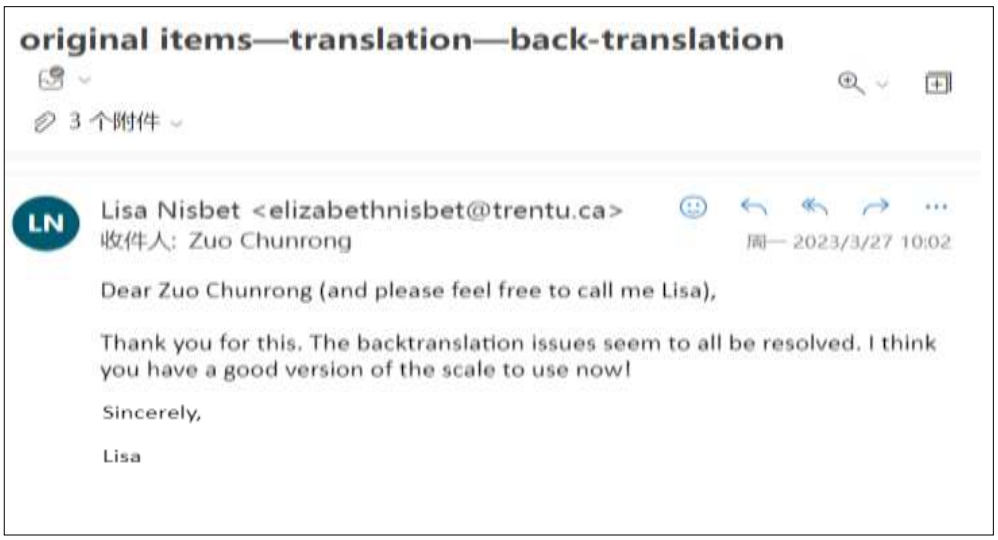
Item Number	Order	Items	1 Disagree strongly	2 Disagree a little	3 Neither Agree or disagree	4 Agree a little	5 Agree strongly
1	original translation backtranslation adjustment	I enjoy being outdoors, even in unpleasant weather. 即使在糟糕的天气里，我也喜欢待在户外。 I enjoy outdoor activities even in bad weather. 我喜欢待在户外，即使在令人不愉快的天气。 I enjoy being outdoors, even in unpleasant weather.					
2 Reverse scored item	original translation backtranslation	Some species are just meant to die out or become extinct. 有些物种注定要消亡或逐渐灭绝。 Some species are destined to become extinct or gradually disappear.					
3 Reverse scored item	original translation backtranslation	Humans have the right to use natural resources any way we want. 人类有权利随心所欲地使用自然资源。 Humans have the right to use natural resources as we wish.					
4	original translation backtranslation	My ideal vacation spot would be a remote, wilderness area. 遥远的原生态区域是我理想的度假胜地。 The remote wilderness is my ideal vacation destination					

批注 [LN1]: there may be a subtle difference here, from the original in that activities means "doing" something, versus simply being outdoors. For example, one could be sitting which is not really an activity (or maybe some people would consider that to qualify as "activity" ?) I think the goal here is to capture how people may be willing to be outdoors or not, when the weather might be less than ideal, but it doesn't necessarily involve a specific 'activity'. Does that make sense to you?

The approval letter from the original scale developer Nisbet for the Chinese version of the Nature Relatedness Scale is illustrated in Figure 3.

Figure 3

The approval letter from the original scale developer Nisbet for the Chinese version of the Nature Relatedness Scale



Results

In this study, the definition of nature relatedness, its operational definition, and the scale were reviewed. Subsequently, following the translation and back-translation process of the scale, it was translated and back-translated by three Ph.D. scholars proficient in both Chinese

and English. The translations were then assessed by five experts and the original scale's creator, Nisbet. Modifications were made, and a final version was produced, resulting in the Chinese version of the Nature Relatedness Scale, as depicted in Figure 4.

Figure 4

The final Chinese version of the Nature Relatedness Scale

自然关联性量表

指导语：对于以下每一个陈述，请使用数字 1 到 5 来评价您对描述的认可程度。请按照您真实感受回答，而不要考虑大多数人的感受。请您仔细阅读相关语句，并在对应位置打上“√”。（注意：请尽量不要选择中间选项）。您的回答没有对错之分，请您认真作答，非常感谢您的配合！

序号	题　项	1 非常不同意	2 有点不同意	3 中立	4 有点同意	5 非常同意
1	我喜欢待在户外，即使在令人不愉快的天气。	1	2	3	4	5
2	有些物种注定要消亡或逐渐灭绝。	1	2	3	4	5
3	人类有权利随心所欲地使用自然资源。	1	2	3	4	5
4	遥远的原生态区域是我理想的度假胜地。	1	2	3	4	5
5	我总是考虑自己的行为是如何影响环境的。	1	2	3	4	5
6	我喜欢挖掘泥土，并享受双手沾满泥土的感觉。	1	2	3	4	5
7	我与自然和环境的联系，是我精神世界的一部分。	1	2	3	4	5
8	我很清楚环境问题。	1	2	3	4	5
9	无论身处何地，我都会留意野生动物。	1	2	3	4	5
10	我不经常到大自然中去。	1	2	3	4	5
11	我做什么都不能改变地球上其他地方的环境问题。	1	2	3	4	5
12	我不是与自然分离的，而是自然的一部分。	1	2	3	4	5
13	深入森林，远离城市的想法是可怕的。	1	2	3	4	5
14	我对大自然的感受不影响我怎样生活。	1	2	3	4	5
15	动物、鸟类和植物应该比人类拥有更少的权利。	1	2	3	4	5
16	即使在城市中心，我也会留意身边的自然环境。	1	2	3	4	5
17	我与自然的关系是“我是谁”的重要组成部分。	1	2	3	4	5
18	没有必要保护自然，因为自然足够强大，能从任何人类影响中恢复。	1	2	3	4	5
19	非人类物种的状况预示着人类的未来。	1	2	3	4	5
20	我对动物所承受的痛苦考虑得比较多。	1	2	3	4	5
21	我感觉与所有生物和地球都有着密切的联系。	1	2	3	4	5

As the first step in standardizing the Chinese version of the scale, the process of translation and back-translation, conducted under the supervision of the original authors, is crucial and fundamental. In this study, the standardization of the three-dimensional Nature Relatedness Scale has been completed through the translation and back-translation process. Firstly, permission was obtained from the original authors, and the process was carried out under their supervision. Ultimately, the final version was approved by the original authors.

In future research, we will focus on the subsequent steps of standardizing the scale. These steps will involve conducting item analysis, exploratory factor analysis, confirmatory factor analysis, validity analysis, and reliability analysis based on a Chinese sample survey. This will provide localized and standardized research tools for Chinese researchers and continue to advance research on nature relatedness in a culturally relevant context.

Conclusion

Based on the research findings in the literature review, a systematic analysis was conducted on the definition, operational definition, and scale classification of nature relatedness. This

study emphasized the standardized translation and back-translation process of the Chinese version of the three dimensional Nature Relatedness Scale. Following the professional evaluation by five experts and the original scale's author, we successfully completed the Chinese-translated version of the scale. The key significance of this process lies in ensuring the accuracy and cultural adaptability of the scale's translation and back-translation, laying the foundation for subsequent assessments of the scale's reliability and validity. This is crucial for gaining a deeper understanding of the relationship between individuals and nature in the Chinese context and holds important implications for related research in the fields of psychology and environmental science.

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Conflict of Interest

There isn’t any chance of a conflict of interest. On behalf of all authors declares that there is no conflict of interest.

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