ISSN 2522-6398 Vol. 8, Issue 4: 66-74, DOI: 10.25236/FER.2025.080410

A Study on the Differences in Nature Views between Urban and Rural Preschool Children: An Analysis Based on Phenomenography

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Abstract: *It is the mission of the times to cultivate ecological views of nature in both urban and rural preschool children. Clarifying their nature views and the differences between them is crucial for achieving this goal. 301 preschool children from urban and rural areas in their final year of kindergarten were taken as participants and phenomenography is employed as the research method to analyze the nature views constructed by urban and rural preschool children and their differences from the perspective of nature connectedness. The results reveal that the nature view constructed by urban preschool children is a humanized nature transformed through human practices. Additionally, there is a certain degree of nature deficit disorder. On the other hand, the nature view of rural preschool children, to some extent, reflects the ecological view of nature in which humans continuously transform the pristine nature into a humanized nature through practice. Significant differences exist between urban and rural preschool children in their cognitive representations, emotional experiences, and behavioral manifestations of their nature views. Both groups lack understanding and awareness of nature conservation. Besides, they display anthropocentrism characterized by a "subject-object dichotomy." Thus, strengthening nature connectedness can help promote children's construction of ecological nature views.*

Keywords: *Natural view; Nature connectedness; Education for sustainable development; Urban and rural children*

1. Problem posing

Nature views refer to people's fundamental perspectives on the entire natural world and the relationship between humans and nature. In studies of the human-nature relationship, nature connectedness is an emerging direction, highlighting its application value in education for sustainable development [1]. Nature connectedness refers to the extent to which individuals subjectively feel integrated with nature. It consists of cognitive representations, emotional experiences, and behavioral manifestations towards nature. These three components intertwine to jointly shape children's nature views [2]. At present, the global ecological crisis is intensifying. The academic community has reached a consensus on the requirement for sustainable development education in preschool education to address this crisis [3]. On this issue, China has proposed to take the path of Chinese-style modernization. The establishment of the concept of a community with a shared future for humanity and nature and the formation of an ecological view of nature featuring a symbiotic relationship between humans and nature are emphasized. The "China's Education Modernization 2035" issued by the CPC Central Committee and the State Council proposes that one of the main development goals by 2035 is to popularize quality preschool education. Yet, domestic research on preschool children's nature views is concentrated in first-tier cities [4]. There are severe deficiencies in studies exploring the development of the natural views from the children's perspective in third- and fourth-tier cities and rural areas. It is essential to improve the quality of preschool education and pay attention to the current status of nature views among preschool children in third- and fourth-tier cities and rural areas under the guidance of China's strategies for sustainable development, regional coordinated development, and rural revitalization.

Natural experiences during childhood, especially children's interpretations of these experiences, the values and beliefs formed, play a crucial role in shaping their environmental attitudes and behaviors in adulthood [5]. If preschool education aims to guide children to construct ecological views of nature, it is most important to clarify how children understand nature and the relationship between humans and nature.

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That is, what nature views children hold. Thereby, the nature connectedness is taken as the starting point and the geographical differences between urban and rural areas are factored. Additionally, the following questions are mainly raised: What are the preliminary nature views constructed by urban and rural preschool children? What are the differences in cognitive representations, emotional experiences, and behavioral manifestations?

2. Research design

2.1 Research subjects

To ensure children's contact with nature, purposive sampling was utilized to select one kindergarten in the central urban area of Yibin City, Sichuan Province (Kindergarten D), and one in a rural town (Kindergarten Y). Kindergarten D in the urban area has an artificially-built park within 1 km, while Kindergarten Y in the rural town has various natural slopes, vegetable fields, and plants within the kindergarten compound. Moreover, children can see numerous natural landscapes during outdoor activities with a broad view. Based on the age characteristics of the children, the research participants were children in the final year from these two kindergartens, consisting of 140 from Kindergarten D in the urban area and 161 from Kindergarten Y in the rural town.

2.2 Research method

Phenomenography is an educational research method at the meso-level that explores the relationship between individuals and a specific aspect of the world from a second-order perspective. It primarily explores how a group perceives, understands, and experiences the surrounding world by examining the experiences of group members [6]. Phenomenography is not concerned with what a concept itself is (first-order perspective) but rather with how individuals perceive and understand a concept (second-order perspective). It is possible to avoid exploring the natural views of preschool children from an adult perspective (first-order perspective) to a certain extent by applying phenomenography. Thus, more attention can be paid to how preschool children perceive, understand, and experience nature based on their own experiences. The natural views can be explored from a children's perspective (second-order perspective). Since preschool children are in the pre-operational stage and they have relatively limited language expression abilities, the combination of drawing and interviewing is the best means to collect data in phenomenography [7]. Ultimately, phenomenography was adopted as the research method and materials were collected through drawing and interviewing. Then, the conceptual categories formed by children's perceptions, understandings, and experiences of nature were sorted out by combining the three dimensions of cognitive representations, emotional experiences, and behavioral manifestations.

2.3 Research process

The head teacher distributed an A4 sheet of white paper to each child and then guided them to draw the nature they knew. Specific prompts included, "Draw the nature in your mind. What do you often do in nature?" Researchers would conduct brief inquiries based on children's works and record real-time observations during their drawing. It focused primarily on those that were abstract or difficult to understand. When collecting the drawings, two to three class teachers who were more familiar with the children ① conducted interviews with them. The main questions involved, "What did you draw? Where are you (if there are no people in the drawing)? Who are you with (if there are many people in the drawing)? What are you (or you all) doing? How do you feel (or what is your mood)?" etc. The interview results were written on the top (or back) of each painting.

2.4 Data processing

The drawings and interview records were converted into quantitative data using a binary system. The specific steps were as follows: Firstly, the processing was based on the coding framework of Kalvatis and Monhardt. A visual content analysis program was adopted. The work numbers② were used as the column headings and various elements in the works were applied as row headings in the Excel table. A "1" indicated the presence of an element while a "0" denoted its absence for data collation③. Secondly, eight types (emotions, scenes, styles, figures, plants, animals, natural objects, and artificial objects) verified by experts and determined by ZHU Yan and WU Lingqiong were employed to organize the drawings and interview records. The objective was to further explore the conceptual categories formed

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by preschool children's perceptions, understandings, and experiences of nature hidden in the data. Thirdly, the drawings and interview records were re-organized across three dimensions of cognitive representations, emotional experiences, and behavioral manifestations based on repeated discussions within the research team. Fourthly, SPSS 26.0 software was adopted to conduct descriptive and difference analyses on the data.

3. Research findings

3.1 Cognitive representations of nature and their differences between urban and rural preschool children

Children's cognitive representations of nature mainly explore the types, categories, and combinations of "natural" elements from their perspectives.

3.1.1 The types of natural elements perceived by urban and rural children are basically the same. However, there are significant differences in the proportions of each type.

As demonstrated in Table 1, the main natural elements perceived by urban and rural preschool children are natural objects, plants, animals, artificial objects, and humans. All these types account for a high proportion. Except that the proportion of the animal type in urban areas is 49%, the rest are all over 50%. Further chi-square tests reveal significant differences in the types of natural elements perceived by urban and rural preschool children. Among them, the differences in plants and artificial objects were the most significant. Animals and humans came next. The lowest was natural objects. Thereby, it can be observed that the types of natural elements in the cognitive representations of nature by urban and rural preschool children are basically the same. However, there are significant differences in the proportions of each element types.

3.1.2 The greatest difference in the perception of nature between urban and rural children lies in the types of plants. Urban children perceive a relatively single variety of plants.

As illustrated in Table 1, the richness of element types in the cognitive representations of nature by urban and rural preschool children is not high. The proportions are all below 50%. The most prominent are natural objects mainly of two types. The proportion is more than 45%. The richness of animal types is the lowest. The proportion of three or more types does not exceed 5%. Further chi-square tests find that there are significant differences between urban and rural preschool children in one-type, two-type, and three-or-more-type plants in their perception of nature, as well as in one-type animals and three-or-more-type natural objects. Specifically, the difference in three-or-more-type plants is the most significant, followed by three-or-more-type natural objects, two-type plants, one-type animals. The lowest is one-type plants. Therefore, the greatest difference in the perception of nature by urban and rural preschool children lies in the types of plants. There is high richness in villages and towns and monotony in cities.

3.1.3 Both urban and rural children understand ecology mainly based on two-element combinations, but there are great differences in specific combinations.

As shown in Table 1, the understanding of ecosystems by urban and rural preschool children is weak. The proportion of the existing element combinations does not exceed 30%. Urban preschool children perceive ecology mainly based on the combinations of trees and birds (16%) and water and fish (16%), while rural preschool children's understanding is mainly based on the combinations of flowers and insects (30%) and trees and birds (23%). Further chi-square tests display that there are significant differences in the combinations of flowers and insects, and water and fish in the understanding of ecosystems by urban and rural children. Thus, both urban and rural preschool children's understanding of ecosystems is mainly based on two-element combinations. There are great variations in the specific combinations. Urban children perceive more combinations of water and fish, while rural children comprehend more combinations of flowers and insects.

3.1.4 Urban children perceive nature mainly through artificial landscapes, while rural children apprehend it mainly through natural landscapes.

As indicated in Table 1, urban children's understanding of nature is mainly pure nature + artificial objects (51%) in the works representing nature, while rural children perceive it mainly as pure nature (52%) and pure nature + artificial objects (53%). The proportions of the combinations of pure nature + humans and natural objects + artificial objects are not higher than 20%. Further chi-square analysis reveals significant differences in the combinations of pure nature and pure nature + artificial objects in

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the works representing nature by urban and rural preschool children. Rural children are more inclined to represent nature as pure nature, while urban children are prone to depict it as pure nature + artificial objects. Combined with the frequencies of element types, it can be seen that urban children's perception of nature is primarily artificial landscapes composed of artificial objects, natural objects, plants, and animals in different ways, while rural children perceive it mainly as natural landscapes.

Table 1: Differences in cognitive representations of nature between urban and rural preschool children.

Cognitive representations		Urban N=140 Frequency/Percentage *n*	%	Rural N=161 Frequency/Percentage *n*	%	χ^2value	*P* value
Element types							
Plants		95	68	151	94	33.720***	<0.001
Animals		69	49	105	65	7.793**	0.005
Natural objects		117	84	156	97	6.019*	0.014
Artificial objects		107	76	83	52	19.907***	<0.001
Humans		100	71	91	57	7.176**	0.007
Number of elements							
Plants	Only one	50	36	41	25	6.543*	0.011
	Two	28	20	53	33	7.076**	0.008
	Three or more	17	12	57	35	21.853***	<0.001
Animals	Only one	38	27	67	42	6.905**	0.009
	Two	22	16	34	21	1.444	0.230
	Three or more	7	5	4	2	1.346	0.246
Natural objects	Only one	34	24	28	17	2.176	0.140
	Two	64	46	79	49	0.338	0.561
	Three or more	21	15	49	30	9.996**	0.002
Combination of elements							
Understanding of ecology	Tree & bird	22	16	37	23	2.509	0.113
	Flower & insect	8	6	48	30	28.720***	<0.001
	Water & fish	22	16	9	6	8.308**	0.004
Representation in works	Pure nature	14	10	52	32	21.749***	<0.001
	Pure nature + humans	18	13	32	20	2.663	0.103
	Pure nature + artificial objects	71	51	53	33	9.789**	0.002
	Natural objects + artificial objects	23	16	22	14	0.450	0.502

Note: Pure nature refers to natural scenes composed of animals, plants, and natural objects in various ways.
* *P*<0.05, ** *P*<0.01, *** *P*<0.001, the same below.

3.2 Emotional experiences of urban and rural preschool children towards nature and their differences

Children's emotional experiences towards nature are classified into three emotional tones: positive, neutral, and negative, based on the colors in children's paintings and interview records. Natural empathy is closely related to children's pro-environmental behaviors in their emotional experiences towards nature, while natural anthropomorphism reflects the degree of children's natural empathy to some extent [8]. Therefore, natural anthropomorphism is also considered as one of children's emotional experiences towards nature.

3.2.1 Urban and rural children primarily experience positive emotions towards nature, though some urban children lack experience with nature.

As demonstrated in Table 2, urban and rural preschool children perceive nature primarily with positive emotions, with no negative emotions reported. Rural children exhibit the highest proportion of positive emotions (99%), followed by urban children (79%). However, when asked, "How do you feel (mood)?" during interviews, 21% of urban children remained silent or responded "I don't know." Neither urban nor rural preschool children reflected negative emotional experiences towards nature. Further chi-square tests reveal significant differences in emotional tones between urban and rural preschool

ISSN 2522-6398 Vol. 8, Issue 4: 66-74, DOI: 10.25236/FER.2025.080410

children's emotional experiences towards nature. Some urban preschool children lack direct experiences with nature and struggle to express their emotional feelings in natural settings compared to rural children.

3.2.2 Urban and rural children show slightly inadequate empathy towards nature, with no notable disparities.

As illustrated in Table 2, the frequency of natural anthropomorphism in urban and rural preschool children's perception of nature is slightly low (< 40%). Natural anthropomorphism primarily refers to the attribution of human-like physical characteristics or thoughts to non-human elements through children's drawings or verbal expressions, such as depicting a sun with facial expressions or describing rain as "alling in heart-shaped drops of love" during interviews. Preschool children are in a special period of animism and it is a common phenomenon for them to establish emotional connections with nature through natural anthropomorphism and generate natural empathy. Yet, the study found that the frequency of urban and rural preschool children assigning human-like physical characteristics or thoughts to non-human elements through their works or language is not high. Thus, urban and rural preschool children show a slight lack of empathy towards nature. Further chi-square tests indicate no significant differences between urban and rural areas.

Table 2: Differences in emotional experiences towards nature between urban and rural preschool children.

Emotional experiences	Urban N=140 Frequency/Percentage		Urban N=161 Frequency/Percentage		χ^2value	*P* value
	n	%	*n*	%		
Emotional tones						
Positive	111	79	159	99	30.734***	<0.001
Neutral	29	21	2	1		
Natural empathy						
Natural anthropomorphism	53	38	55	34	0.445	0.505

Note: The results of negative emotions are zero and thus not presented in the table.

3.3 Behavioral manifestations of urban and rural preschool children towards nature and their differences

The behavioral manifestations of urban and rural preschool children towards nature are divided into the following types in terms of interaction modes: free play, outdoor activities, nature observation, and nature care. Based on the different numbers of people and their relationships in the paintings, activity types are classified into individual activities, peer activities, and family activities.

3.3.1 Both urban and rural children primarily interact with nature through free play. This is more prominent in urban children.

As displayed in Table 3, free play accounts for the highest proportion of interaction modes between preschool children and nature. Among the four interaction modes, more than 50% of urban children engaged in free play, while outdoor activities, nature observation, and pro-nature behaviors each accounted for less than 20%. Further chi-square analysis reveals significant differences in free play interactions between urban and rural preschool children. Overall, free play was the dominant form of interaction with nature for both groups, with urban preschool children exhibiting this behavior more prominently.

3.3.2 Rural children are more enthusiastic about nature observation compared with urban children.

As shown in Table 3, the frequencies of free play (38%) and nature observation (34%) among rural preschool children were similar, both exceeding 30%. Further chi-square analysis indicates that the difference in nature observation interactions between urban and rural children is the most significant. This suggests that, compared to their urban counterparts, rural preschool children are more inclined toward nature observation.

3.3.3 Both urban and rural children lack behaviors of outdoor activities and nature care. The behavior of nature care is the least common.

Table 3 shows that outdoor activities account for less than 20% of interactions for both urban and rural preschool children, while nature care is less common, with proportions below 10%. Further chi-square analysis shows no significant differences between urban and rural children in these two interaction

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modes. These findings suggest that both urban and rural preschool children lack engagement in outdoor activities, with an even greater deficiency in nature care.

3.3.4 Both urban and rural children engage in insufficient family activities in nature. Peer activities are more frequent among urban children.

As shown in Table 3, the proportions of family activities in nature among urban and rural preschool children are the lowest, both below 20%. In contrast, peer activities were the most common, with participation rates exceeding 20%. Further chi-square analysis reveals significant differences in peer activities between urban and rural children. These findings indicate that family activities in nature are insufficient for both groups, while urban preschool children are more likely to engage in peer activities.

Table 3: Differences in behavioral manifestations towards nature between urban and rural preschool children.

Behavioral manifestations	Urban N=140 Frequency/Percentage		Urban N=161 Frequency/Percentage		χ^2value	*P* value
	n	%	*n*	%		
Interaction modes						
Free play	74	53	61	38	6.784**	0.009
Outdoor activities	23	16	33	20	0.818	0.366
Nature observation	17	12	54	34	19.022***	<0.001
Nature care	10	7	5	3	2.578	0.108
Activity types						
Individual activities	33	24	29	18	1.415	0.234
Peer activities	46	33	34	21	5.288*	0.021
Family activities	21	15	28	17	0.314	0.575

4. Research discussion and analysis

4.1 Commonalities in the natural views of urban and rural preschool children

Consistent with domestic and international research, the natural views of urban and rural preschool children are constructed through different combinations of five conceptual categories: natural objects, plants, animals, artificial objects, and humans. Their interactions with nature are primarily through free play such as games, often accompanied by positive emotional experiences. However, both urban and rural preschool children have a weak understanding and awareness of nature conservation and tend to perceive the relationship between humans and nature through an anthropocentric lens, characterized by a "subject-object dichotomy." Anthropocentrism holds that humans are the center of the world and the subject of value, while nature serves as the object of value that fulfills human needs. Therefore, there are few behaviors of caring towards nature among urban and rural preschool children. Their level of natural empathy, reflected through natural anthropomorphism, is also slightly low. It is noteworthy that foreign studies have found that children place more emphasis on nature protection. For example, Spiteri's research found that children emphasize the importance of protecting and caring for the environment rather than destroying it [9]. Collado et al. found that rural children are more likely to recognize nature as essential for human survival and are more inclined toward conserving natural resources [10]. This discrepancy may stem from differences in the educational objectives of early childhood nature education in China. As LUO Yao mentioned, "The three-dimensional goal-setting of nature education neglects the sense of unity between children and nature. The practice of nature education is prone to creating a subject-object relationship between children and nature [11]." At present, sufficient attention has been placed on the practical activities of nature education in the preschool stage. However, teachers tend to prioritize cognitive and skill goals under intellectually oriented educational approaches. Emotional goals are often ignored. Observation activities in the "nature corner" are the most common form of nature education in kindergartens. Yet, such object-oriented observation activities easily lead to a subject-object relationship between children and nature. Anthropocentrism with a "subject-object dichotomy" will be fostered. Thereby, even though preschool children are in the animistic period, it is hard to awaken their empathy for nature and stimulate caring behaviors towards it without the guidance of emotional goals and with an education that perceives nature from a subject-object dichotomy perspective.

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4.2 Differences in the nature views of urban and rural preschool children

There are notable differences in the nature views of urban and rural preschool children. Overall, urban children tend to conceptualize nature as a humanized environment that has been modified through human activity, whereas rural children are more inclined to perceive nature as a dynamic process in which the natural world is gradually transformed by human practices. In this context, the pristine nature refers to the natural world unaffected by human activities, while the humanized nature denotes the natural world that has been modified by human activities and exhibits an artificial touch. [12]. Specifically, differences in the nature views of urban and rural preschool children are reflected in cognitive representations, emotional experiences, and behavioral manifestations. Differences in cognitive representations are mainly embodied in the frequency, types, and combinations of different elements. Variations in emotional experiences are primarily embodied in neutral emotional tones. Differences in behavioral expression are mainly reflected in the interaction modes of natural observation and free play, as well as the types of peer activities. Collado et al.'s research also found heterogeneity in the construction of natural concepts between urban and rural children, mainly manifested as urban children emphasizing the differences between natural and built environments more than rural children [10].

Children aged five to six years are in the pre-operational stage and they perceive nature mainly through direct experiences obtained based on the five senses as the physiological basis. To a certain extent, children believe that the nature perceived through their five senses is the same as the nature beyond their senses [13]. This viewpoint is validated by the observed differences in cognitive representation between urban and rural preschool children. Shaped by their everyday environments, urban preschool children primarily perceive nature in terms of celestial bodies such as the sun (59%) and clouds (54%), alongside artificial landscapes dominated by roads, playground equipment, and other man-made structures (66%). In terms of understanding ecological relationships, urban preschool children have more experiences of "watching and feeding goldfish" in the park due to the existence of artificial lakes nearby. This results in a better understanding of the ecological combination of water and fish compared to rural preschool children. However, given the limited presence of pristine natural landscapes in the living environments, urban preschool children have fewer opportunities to engage with real real nature. As a result, their perception of plants and animals is significantly weaker than that of rural children and there is a more homogeneous awareness of plant elements. Rural preschool children perceive nature as an untouched landscape composed mainly of natural objects such as the sun (70%) and clouds (70%), plants such as trees (73%), grass (68%), and flowers (46%), and animals such as insects (43%) and birds (32%). However, rural environments are not devoid of human influence; artificial structures shaped by human activity are also present. Consequently, rural preschoolers' perception of nature includes both pristine nature (32%) and humanized nature (33%), with both categories occupying comparable proportions. Overall, rural preschool children perceive more pristine nature, so the richness of natural elements they understand is far greater than that of urban children.

Emotional experiences constitute a core component of nature view. The differences in emotional experiences of urban and rural preschool children towards nature are mainly manifested in the fact that some urban children have difficulty in articulating their emotional experiences in nature. This may stem from the situation that urban children have fewer opportunities to directly engage with real nature. Their experiences of nature mostly come from indirect experiences derived from picture books, stories, or film and television works. Behavioral manifestations represent children's interactions with nature. The differences in the behavioral manifestations of urban and rural preschool children towards nature are mostly reflected in the aspect that rural preschool children are more enthusiastic about nature observation compared to urban counterparts who prefer free play, primarily in peer activities. Based on this, it can be observed that urban preschool children tend to view themselves as the subject in their interactions with nature. Thereby, their interactions to humanized nature and others are extended. Besides, there is a tendency of anthropocentrism in their understanding of nature. Rural preschool children, through natural observation, can perceive to some extent the process by which humans continuously transform the pristine nature into a humanized nature through practice. Yet, this process still exhibits an anthropocentric tendency characterized by the "subject-object dichotomy" with humans as the subject and nature as the object.

Cognitive representations, emotional experiences, and behavioral manifestations are interwoven and complementary. They collectively shape the natural views of preschool children. A study on urban and rural elementary school students in the United States found that young children tend to hold an anthropocentric understanding of nature. However, this anthropocentric perspective gradually diminishes among rural children as they age, whereas it persists among urban children. Exposure to nature in forming

ISSN 2522-6398 Vol. 8, Issue 4: 66-74, DOI: 10.25236/FER.2025.080410

cognitive representations is a significant influencing factor [14]. Thus, the ecological view of nature initially constructed by rural preschool children, in which humans continuously transform the pristine nature into a humanized nature through practice, is conducive to weakening anthropocentrism. Conversely, the humanized view of nature constructed by urban preschool children to some extent reinforces their anthropocentric tendencies. Furthermore, urban preschool children lack opportunities to perceive pristine nature. Their natural observation activities are limited. The nature they perceive is more as a humanized one. There is a narrow range of plant species and a lack of emotional experiences towards nature for some children. Consequently, urban preschool children suffer from a certain degree of nature deficit disorder and exhibit plant blindness. It is noteworthy that the phenomenon of "plant blindness" may vary across cultural groups. For instance, research on the natural views of preschool children in first-tier cities in China found that "plant richness is the highest; natural object richness comes next; animal richness is the lowest [4]." Foreign studies have identified plant blindness among preschool children. However, it is unlike the narrow range of plant species perceived by urban preschool children in China. Foreign preschool children exhibit plant blindness by perceiving far more animals than plants [15][16]. Fortunately, rural preschool children do not show plant blindness or nature deficit disorder.

5. Research suggestions

Nature connectedness should be strengthened from the three aspects of cognitive representations, emotional experiences, and behavioral manifestations. This effort can help promote children to construct an ecological view of nature.

In terms of cognitive representations: The embodied experiences of urban preschool children with the real nature should be enriched by accumulating raw experiences. Close encounters with real nature should become an essential activity for them. Their parents should take their children away from the city during weekends and holidays as much as possible. They can head to nearby townships to get close to, observe and experience real nature. This will enrich their embodied experiences and help them accumulate primary experiences of real nature. In addition, integrating traditional Chinese culture into the practical activities of nature education can enhance children's understanding of nature. Existing research has found that the richness of plant elements perceived by preschool children in first-tier cities in China is not poor. The reason may be that these children are subtly influenced by more traditional Chinese culture in family education and kindergarten education, such as plants mentioned in "Twenty-Four Solar Terms, Tang and Song poetry, and The Book of Songs [4]."

In terms of emotional experiences: Emotional connections should be deepened and the awareness of a community with a shared future for humanity and nature should be cultivated among urban and rural preschool children. Preschool children are in the animistic period. Thus, it is highly feasible and efficient to accomplish these objectives by promoting in-depth encounters between preschool children and nature [17]. Attempts can be made to change traditional intellectual-based educational approaches and emphasize aesthetic educational methods. Children can be actively guided to feel and experience that nature is an inorganic part of the human body through immersive nature education activities such as hiking, mountain climbing, bird watching, camping, and planting. Thereby, emotional connections can be intensified. Children's unconscious sense of unity with nature can be awakened. The awareness of the human-nature life community can be constructed.

In terms of behavioral manifestations: Natural games should be created to promote education for sustainable development among both urban and rural preschool children. Natural games stress continuous interaction between young children and natural objects or materials in natural environments. Thereby, the relationship between children and nature can be strengthened [18]. Kindergartens should create natural games to enrich the ways in which preschool children interact with nature and guide them in constructing an ecological view of nature. The ecological view of nature emphasizes that humans are part of nature, and humanity and nature are a community of life. It is necessary to avoid extreme ecocentrism and anthropocentrism when guiding the natural views of preschool children. In implementing natural games, emphasis can be placed on guiding them to develop moral concern for nature and understanding of ecological ethics for urban preschool children. For rural counterparts, they can be guided to comprehend the relationship between humans and nature with a public interest orientation.

Notes

①The two to three teachers primarily compass: one head teacher, one assistant teacher (or childcare

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staff), and an intern in urban kindergartens.

②For example, the number for Student No. 1 in Class 1 of Kindergarten D is D-1-1. The number for Student No. 12 in Class 3 of Kindergarten Y is Y-3-12.

③Element identification is primarily based on children's interview records. Elements omitted without interview records are determined through discussions by the research team. Elements that cannot be identified are not counted.

Acknowledgement

Fund projects: "Research on Nature Education in Rural Kindergartens from the Perspective of Embodied Cognition," a special project on rural education development of Yibin University (XCJY2021B06); "Research on Improving the Quality of Children's Autonomous Games under the Concept of Game Curriculumization," a cultivation project of Yibin University (2022PY40)

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