

ARTICLE

Community arts and participatory engagement in a panda-themed environmental art initiative

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Abstract

Existing research recognizes art's role in environmental awareness, but seldom examines participatory art as both method and engagement. This study explores how participatory art practices can foster ecological awareness in the context of wildlife tourism. Conducted at the Chengdu Research Base of Giant Panda Breeding, the research invited over 1,000 tourists to draw circles representing their perceived relationships with nature, giant pandas, and pets—an activity inspired by Schultz's Connectedness to Nature (CNT) scale. Although the task was initially designed as a visual survey, it quickly evolved into a shared, creative experience that generated spontaneous participation, meaningful conversations, and emotional engagement. What began as a scientific investigation revealed itself to be an ecological art project. Participants were not merely data contributors but co-creators, offering their own cultural and personal narratives to the panda-human coexistence. Drawing from Timothy Morton's theory that art can foster non-coercive, relational experiences with the more-than-human world; this paper frames the drawing activity as an act of ecological art. Here, the giant panda is not simply a passive subject but an active participant in shaping a shared affective space, prompting reflections on conservation, interspecies coexistence, and emotional entanglements. This art-based approach illustrates how cultural and affective dimensions can be integrated into environmental communication through the engagement of both pandas and tourists. It highlights the value of participatory creativity as both a research method and a meaningful form of public engagement. As environmental challenges intensify, this study suggests that ecological art offers a promising pathway for fostering inclusive, grounded, and emotionally resonant environmental discourse. It contributes not only to research on CNT but also to the broader work of reimagining human relationships with the natural world.

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1. Introduction

I did not need to look up from the folding table on the camping trailer to sense the quiet shift in atmosphere. A small group of tourists had formed a quiet semicircle, their eyes fixed on two children, the paper they were drawing on, and the slow emergence of circles

and images. It was one of those rare, almost meditative moments in my fieldwork—one where structured research gave way to spontaneous participation.

The task itself was simple—participants were asked to depict their relationship with nature, the giant panda, and their pets using circles. As I neared the end of my data collection for the day, two children received the last remaining survey sets. What I had not anticipated was the magnetic effect their creativity would have. One by one, adults stopped—drawn in not by obligation but by something more instinctive: Curiosity, nostalgia, or perhaps a momentary reconnection with their own childhood creativity.

No one hurried away. They listened as I asked the final question—“Why do you draw your circles this way?”—absorbing the children’s explanations. This was an environmental experience in its most natural and organic form: Not a lecture, not a signboard, but a shared, participatory experience. Art, creativity, and participatory observation led to quiet reflection.

The drawing survey had also been my most fulfilling data collection experience so far. The tasks led to conversations with participants, and the drawings were filled with surprises and unexpected interpretations. Along the way, the participants and I exchanged jokes and casual chats, making the process feel more interactive than transactional. In just a short time, I received immediate feedback: “This survey is really interesting,” “This is very meaningful,” “I enjoyed this so much.”

In his book *All Art is Ecological*, philosopher Timothy Morton¹ argues that the experience of art provides a framework for fostering harmonious relationships between humans and non-human entities—an aspiration central to ecological ethics and politics. He further suggests that artistic experience cultivates ecological awareness by attuning us to a form of coexistence with the artistic object in a non-coercive manner. Ecological art practice, in this view, emerges through a sense of solidarity with non-human beings, allowing shared space and time with the non-human “other” to reshape human experience. Artistic practice, therefore, serves a dual function—it facilitates communication between humans and nature, and enables transformative processes, such as ecological and environmental awareness, to unfold.

From Morton’s perspective, the drawing survey I conducted can be regarded as an ecological art experience in at least two significant ways. First, the drawing task was designed to evaluate tourists’ perceived relationships with the natural world. This activity, though rooted in the goals of social science research, was artistic in nature.

Second, the process of drawing—ultimately a form of art-making—fostered a transformative, collective experience that engaged the researcher, the panda, and participants in unexpected ways.

In the present age of the Anthropocene, where human bodies and human-made products dominate the Earth, the need for ecological communication and the cultivation of environmental awareness is more urgent than ever. Art has reemerged as a vital educational tool, promoting creativity, critical thinking, and global citizenship in the face of ecological and environmental challenges.²⁻⁸ This renewed emphasis on artistic approaches to environmental education aligns with growing scholarly interest at the intersection of environmental communication and the visual arts.^{9,10} It also invites us to reconsider non-human animals’ connection and integration into our human world.

This study explores a visual, art-based research method inspired by the Connectedness to Nature (CNT) scale originally proposed by Schultz.¹¹ Schultz’s¹¹ scale employs a visual measure—seven pairs of overlapping circles—to assess individuals’ perceived connection to the natural world. Building on this approach, the present study investigates participants’ connections to nature, giant pandas, and their pets through a participatory circle-drawing method conducted at the Chengdu Research Base of Giant Panda Breeding. The fieldwork involved collecting drawings from over 1,000 tourists, with the researcher actively engaging in and observing the artistic process. Like all acts of creation, this collective art-making experience generated meaningful moments for both participants, the researcher and, to a certain extent, the giant pandas. A mixed research method—combining a quantitative exploration of the relationship between creative circle drawing, visitor demographics, and visitor experience with a qualitative reflection of the researcher’s own fieldwork—was employed to investigate the rich dataset generated. This paper aims to shed light on these ecological art practices by reflecting on how participatory creativity fostered environmental awareness within the context of conservation.

2. Literature review

2.1. Ecological art and participatory creativity

Ecological art is an interdisciplinary artistic practice that integrates ecological ethics and systems theory to examine the relationships between humans and the natural world.⁵ Rather than simply representing nature or the environment, ecological art actively engages with ecological systems to generate both transformative artistic expressions and tangible ecological change.⁵ Stoltz¹² differentiates ecological art from other forms of artistic

practice by emphasizing its direct interaction with physical ecosystems. In ecological art, artists establish relationships with the environment through processes of appropriation, regeneration, and coexistence—relationships that remain open-ended and continuously evolving.

Kagan¹³ outlines several principles and characteristics that define ecological art, including connectivity, reconstruction, ecological ethics, environmental stewardship, non-linear (re)generativity, dynamic multi-level balancing, and diverse methodological approaches to engaging the intricate web of life. Connectivity involves attending to the complex interrelationships present in our environment across multiple dimensions. Reconstruction refers to the use of natural materials or the incorporation of environmental forces in the creation of artworks. Ecological ethical responsibility entails acts of reclaiming, restoring, and remediating damaged ecosystems. Environmental stewardship focuses on informing the public about ecological processes and the environmental challenges facing the planet. Non-linear (re)generativity encourages the reimagining of ecological relationships and the creative exploration of new possibilities for coexistence and sustainable mutuality. These interwoven aspects collectively shape the multi-layered experience of ecological art.

Clapp^{14,p.1} argues that creativity is not an individual trait but a “socially distributed and participatory process.” Participatory creativity shifts the emphasis from individual contributions to collaborative, group-based processes. Ecological art’s emphasis on transformation and co-evolution with the natural world makes it inherently participatory. Simus¹⁵ suggests that engaging in the creation, appreciation, and interpretation of environmental art contributes to the development of ecological citizenship, as participatory artistic processes reflect public environmental concerns and communal values.

A growing body of research has demonstrated how ecological art fosters community engagement, environmental awareness, and education.^{16–18} For instance, Roe and Buser¹⁸ describe a collaborative, arts-led research project that cultivates ecological citizenship and deepens understandings of human-nature entanglements. Mamur and Çelik¹⁹ implemented an after-school art program for children aged 9–13 and found that participants’ environmental knowledge and awareness significantly improved. Most notably, the program facilitated the emergence of a collective environmental consciousness—a product of the participatory creation process that, in turn, enhanced the children’s creativity. Similarly, Rathwell and Armitage²⁰ demonstrated that ecological art practices contribute to social-ecological resilience by helping communities integrate diverse knowledge systems.

Importantly, recognizing and cultivating creativity within collaborative experiences is essential for ecological art to meaningfully impact both the natural world and human participants. Clapp¹⁴ identifies six core principles that enable participatory creativity:

- (i) Ideas are the creative agents;
- (ii) Ideas evolve through artifacts over time;
- (iii) Creativity is shared across diverse contributors;
- (iv) Creative work has intention and purpose;
- (v) There are many ways to be creative;
- (vi) People play flexible and multiple roles.

Defining creativity through collaborative experiences also suggests that non-human agencies—more specifically, the giant pandas in this study—should be recognized as active participants contributing to the creation of tourists’ artworks. In Naess’s²¹ notion of deep ecology, the presence of the giant panda serves as a source of inspiration for this collective collaboration. As the research will demonstrate, the pandas entered into the drawings through a dynamic process and in multiple ways. To expand the notion of participation further, Bennett²² invites us to consider how “vital materiality” is embedded in our environmental experiences. The drawing thus becomes a nexus where these materials—bodies, perceptions, movements, and affect—intersect. The moments when and how the pandas were seen, and the meanings these encounters held for tourists, all became creative sources embedded in the artworks.

This study explores how ecological art aligns with these principles of participatory creativity by emphasizing collective engagement, ecological awareness, and process-oriented creation. In ecological art, the focus is not on the individual artist but on the development of ideas through participatory interaction. Collective environmental awareness thus becomes the creative force linking participants to the artwork. While the creative process unfolds over time, participatory creativity enables ongoing transformation. Ecological art is co-created by a diverse group of stakeholders—including artists, community members, and non-human agents—with the aim of transforming both the environment and those who engage with it. Stakeholders participate in various, often fluid roles throughout the process. In sum, ecological art grounded in participatory creativity offers a powerful means to experience and reimagine the human–nature relationship in the Anthropocene.

2.2. CNT and visual research methods

CNT refers to an individual’s perceived sense of interconnection with the natural world.²³ Over the past two decades, a range of measures and scales has been

developed to conceptualize and assess the human–nature relationship through the inclusion of diverse variables.^{23–26} Research on CNT has made significant contributions to the field of environmental psychology, offering robust evidence that interactions with nature can yield physical and psychological benefits.²⁶

One of the most influential models in this domain is Schultz's¹¹ three-dimensional framework, which conceptualizes psychological inclusion in nature through cognitive, affective, and behavioral components. The cognitive dimension captures the perception of interdependence between self and nature; the affective dimension encompasses emotional closeness to and care for the natural world; and the behavioral dimension involves a personal commitment to act in environmentally responsible ways. This model continues to serve as a foundational reference for exploring how various dimensions of connectedness shape pro-environmental attitudes, values, and behaviors across different cultural and situational contexts.

In a recent synthesis of CNT research, Lengieza and Swim²⁶ categorized the literature into three main domains: Situational context, individual difference predictors, and internal psychological states. While empirical work has proliferated, they note a relative lack of theoretical development in the field. Similarly, Restall and Conrad²⁵ observed that only 4% of CNT studies have incorporated visual methodologies—such as participatory mapping—despite their potential to offer unique perspectives. They advocate for the use of geographical visualization as a promising approach in both research and practice, particularly in guiding environmental planning and protected area management.

Addressing the theoretical gaps in CNT research calls for innovative approaches—such as art-based methods and visual mapping—that can offer new insights. A growing number of studies have extended Schultz's visual conceptualization of the human–nature connection, demonstrating the strengths of visual tools in psychometric exploration,^{27–29} enhancing inclusivity in participant sampling,^{30,31} and serving as effective predictors for the inclusion of nature in self.^{28,32–34} Furthermore, because CNT also entails a collective identity dimension—where humans and nature are envisioned as part of a shared community^{35,36}—visual representation can facilitate cooperative action and produce direct benefits for communities.

The visual representation of human–nature connectedness thus supports participatory creativity by actively embodying its core principles. For example, in visualizing CNT, the central creative idea—interconnectedness between people and nature—becomes the catalyst for community engagement and collective

understanding. The visual tools employed are artifacts that evolve over time, shaping and refining both the psychometric model and the conceptual framework.^{27,34} Participatory creativity involves the contributions of diverse publics, as evidenced by the collaborative nature of many visualization studies. These efforts are intentional, aimed at fostering cooperation and encouraging community dialogue. Participants engage through various accessible means—such as interpreting, creating, or reflecting on visual representations—and their roles are fluid, shifting according to context and need.

The use of visual methods in CNT research aligns closely with ecological art practices, as both prioritize the exploration of human–nature relationships and aim to foster transformative experiences within communities. When visual creation is framed as an integral part of an ecological art project, the case studies discussed earlier in this paper take on new interpretive significance. In the following section, I present both visual data collected in the field and my own reflexive insights as a researcher-participant to illustrate how these processes facilitate shared creativity and deepen CNT.

3. Research method

3.1. Visual image collection

3.1.1. Site selection and data collection

Visited by over 12 million people in 2024³⁷—an average of approximately 33,000 visitors per day—the Chengdu Research Base of Giant Panda Breeding (commonly known as the Panda Base) remains one of the most popular tourist attractions in Chengdu, the capital city of Sichuan province in southwestern China. For several consecutive years, TripAdvisor has consistently ranked the Panda Base as the top destination among the “10 Must-Visit Attractions in Chengdu.”

Between December 2024, and January 2025, a 2-month field survey was conducted at two key locations within the Panda Base: The main entrance/exit area and the Villa No. 2 giant panda enclosure. The survey collected responses from approximately 1,200 voluntary and randomly selected visitors. Data collection was carried out alternately by the principal researcher and one research assistant. To ensure data quality, the researcher conducted an unannounced visit to supervise the assistant's data collection sessions. After excluding incomplete or illegible responses, a total of 1,188 valid surveys were retained and subsequently recorded using Wenjuanxing, a Chinese online survey platform.

3.1.2. The study design

The survey was printed on A4 paper, double-sided, and comprised a total of 12 questions. The first page included

an informed consent item, followed by three demographic questions, two questions related to the visitors' experience at the site, one item concerning pet ownership, and three emoji-assisted 5-point Likert scale questions measuring pro-environmental awareness and personal well-being.

The second page featured three visual prompts (Figure 1), each depicting a central image: A flower, a pet dog, and a giant panda. Accompanying each image was a prompt that invited participants to draw a circle representing themselves in relation to the subject. For instance, the prompt for Image A read: "The flower represents nature. In this frame, please draw a circle representing yourself to describe your relationship with nature."

In this study, the dog symbolized pets in general, the flower referred to nature, and the giant panda represented animals in captivity. On-site instructions were also provided by the researcher and the research assistant for participants who had difficulty understanding the drawing task.

The survey design was informed by connectedness to nature index (CNI) surveys, but was deliberately kept concise. Based on the researcher's prior field experience, lengthy questionnaires often led to participant complaints and a subsequent decline in data quality. The circle-drawing task was inspired by studies, such as Martin and Czellar²⁷ and McConnell and Jacobs.³⁴ Furthermore, previous experiences—where tourists expressed reluctance to draw a giant panda due to a perceived lack of artistic skill—motivated the adaptation of this simplified visual approach using circles.

3.1.3. The coding process

After all surveys were uploaded to Wenjuanxing, the researcher and her research assistant began coding the drawings. The coding described each circle drawing in terms of its spatial relationship to the central image (categorized as: Encircling, overlapping, embedded, touching, separate-close, separate-medium, separate-distant, and corner), its orientation (up, upper-right, right, lower-right, down, lower-left, left, upper-left, and center), and its size (small, medium, large).

In addition, many tourists included creative elements beyond the instructed circle drawings. Canvases featuring

such creative expressions were marked for further attention. These creative elements form the central focus of this study. Although the researcher actively engaged in conversations with participants during the fieldwork, these oral exchanges were not thoroughly documented due to the lack of appropriate recording tools. Some shorthand notes were written in the margins of the survey forms, but these were not digitized for further analysis. Drawings that included creative elements were marked with a "Y" in the coding book.

This study also examined how these creative expressions emerged and how they relate to or interact with the instructed circling task.

3.2. Reflexivity

Qualitative research has long emphasized the importance of researcher reflexivity as a key methodological component.³⁸⁻⁴¹ Fook³⁸ defines reflexivity as the process by which researchers critically assess their own assumptions and actions to understand how these influence research outcomes. When researchers actively reflect on their practices with the intention of change or improvement, reflexivity becomes a research method in itself.³⁸ Fook³⁸ also highlights that the interaction between researchers and participants is a crucial component of reflexivity, as the research process is co-constructed by both parties. Palaganas *et al.*⁴⁰ view reflexivity as a journey that transforms the researcher through shifts in epistemology, methodological challenges, and personal insights.

In art-based studies, reflexivity and the research process are often seen as mutually reinforcing. For example, Skukauskaite *et al.*⁴² suggest that reflexivity through art allows researchers to transcend their backgrounds and contexts, creating new opportunities for self-understanding and research development. Bogumil *et al.*⁴³ showed that art can serve as a medium through which students cultivate reflexivity in their qualitative research experiences. Building on a Hegelian framework, Feige^{44p.133} posits that art itself can be considered a form of "reflexive practice."

In the context of this study, framed as an ecological art project, the researcher's reflexivity is aligned with both the core principles of participatory creativity and the transformative nature of situated inquiry. On one

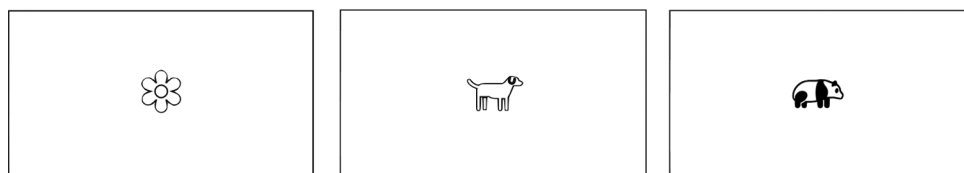


Figure 1. Drawing canvas for nature, pet, and giant panda

hand, participatory creativity arises from dynamic, social, and material interactions among people, non-human participants, and environments, illustrating that the researcher can take on multiple, fluid roles in the creation process. Reflexivity, as discussed above, deepens participants' engagement and learning. On the other hand, ecological art, rooted in systems thinking and ecological ethics, necessitates reflexive embodiment within a network of human and non-human agencies.

4. Results

This section presents both descriptive and inferential findings based on participants' demographic profiles, creative engagement in the drawing tasks, and statistical relationships among key variables.

4.1. Overview of data and creative arts

Table 1 presents an overview of the demographic profiles of the 1,188 participants. It is important to note that this study employed a selective approach to participant sampling. For instance, individuals under the age of 18 and over the age of 55 were actively encouraged to participate through on-site invitations.

Table 2 illustrates the inclusion of creative elements in the circle drawings for each canvas. It is evident that participants produced the most creative drawings in response to the panda canvas, followed by the nature and pet canvases.

4.2. Creative drawings in relation to demographic and situational variables

To explore how demographic differences and visitation experiences contributed to the creative drawings, binary logistic regression was performed. According to Schober and Vetter⁴⁵ logistic regression is used to estimate the association between one or more independent variables and a binary dependent variable. In this study, whether participants engaged in creative art drawings served as the dependent variable, while demographic features and visitation experiences functioned as independent variables contributing to changes in the outcome. All data were imported into the Statistical Package for the Social Sciences version 26.0.0.2 (IBM, United States of America) for analysis.

Table 3 shows that pet ownership significantly influenced participants' creative drawings for the nature canvas. Individuals with pets ($b = -0.391$, $p=0.019$, $\text{Exp}(b) = 0.677$) were significantly more likely to engage in creative drawing with nature. All other variables had $p>0.05$, indicating they did not significantly affect the likelihood of producing a creative drawing. However, the

Table 1. Demographic profiles of participants

Variable	Values (modalities)	Code	Structure		Type of the variables
			f_i	Percentage	
Age	<18	1	121	10.2	NV
	18–25	2	282	23.7	
	26–35	3	452	38.0	
	36–45	4	115	9.7	
	46–55	5	97	8.3	
	>55	6	121	10.2	
Gender	Male	1	411	34.6	NV
	Female	2	777	65.4	
Place of residence	First-tier cities	1	171	14.4	NV
	Sichuan	2	209	17.6	
	Other	3	808	68.0	
Visiting frequency	1 st -time visitor	1	970	81.7	NV
	Returned visitor	2	218	18.3	
Visitation stage	Entering	1	241	20.3	NV
	At the enclosure	2	649	54.6	
	Leaving	3	298	25.1	
Pet ownership	Yes	1	433	36.4	NV
	No	0	755	63.6	

Notes: f_i : Frequency; NV: Nominal variable.

Table 2. Use and distribution of creative arts in three circle drawings

Prints	Creative arts	Structure	
		f_i	Percentage
	Y	178	15
	N	1,010	85
	Y	208	18
	N	980	82
	Y	64	15
	N	370	85
	No pets	754	63

Note: f_i : Frequency.

model was significant overall for age groups (Chi-square = 16.366, degrees of freedom [df] = 5, $p=0.006$). The model's predictive power was limited, explaining only 2.3–4.1% of the variance in the outcome (Cox and Snell $R^2 = 0.023$, Nagelkerke $R^2 = 0.041$).

Table 4 reveals that age ($p=0.000$) and visitation stage (Chi-square = 6.285, $df = 2$, $p=0.043$) were statistically significant predictors of creative drawing. Participants

Table 3. Binary logistic regression of creative drawings for the nature canvas

Values (modalities)	<i>b</i>	S.E.	Wald	df	Sig.	Exp (<i>b</i>)	95% C.I. for Exp (<i>b</i>)	
							Lower	Upper
Age (ref: >55)	-	-	16.366	5	0.006	-	-	-
<18	-0.002	0.372	0.000	1	0.996	0.998	0.481	2.071
18–25	0.509	0.295	2.976	1	0.085	1.664	0.933	2.969
26–35	-0.239	0.296	0.653	1	0.419	0.787	0.441	1.406
36–45	-0.388	0.401	0.939	1	0.333	0.678	0.309	1.488
46–55	-0.228	0.403	0.321	1	0.571	0.796	0.362	1.752
Gender (ref: Female)	-	-	-	-	-	-	-	-
Male	-0.049	0.175	0.077	1	0.782	0.953	0.675	1.343
Residence (ref: Other)	-	-	2.655	2	0.265	-	-	-
First-tier	0.326	0.225	2.104	1	0.147	1.385	0.892	2.152
Chengdu	-0.105	0.241	0.191	1	0.662	0.900	0.562	1.442
Visiting frequency (ref: Returned)	-	-	-	-	-	-	-	-
1 st -time visitor	-0.051	0.230	0.050	1	0.824	0.950	0.605	1.491
Visitation stage (ref: Leaving)	-	-	1.455	2	0.483	-	-	-
Entry	0.298	0.256	1.352	1	0.245	1.347	0.815	2.225
At the enclosure	0.213	0.217	0.966	1	0.326	1.237	0.809	1.891
Pet ownership (ref: Yes)	-	-	-	-	-	-	-	-
No	-0.391	0.167	5.492	1	0.019	0.677	0.488	0.938
Constant	-1.669	0.382	19.117	1	0.000	0.188	-	-

Notes: Model summary: $-2 \log \text{likelihood} = 975.742$; Cox and Snell $R^2 = 0.023$; Nagelkerke $R^2 = 0.041$.

Abbreviations: C.I.: Confidence interval; df: Degrees of freedom; S.E.: Standard error; Sig.: Significance.

aged 18–25 were approximately 2.44 times more likely to produce a creative panda drawing than those aged over 55. While the visitation stage had a significant overall effect, individual categories did not show significance on their own. Gender ($b = -0.298$, $p = 0.081$, $\text{Exp}[b] = 0.742$) exhibited a trend-level effect, suggesting that males might be less likely to create a creative drawing on the panda canvas. Residents from first-tier cities ($b = 0.415$, $p = 0.052$, $\text{Exp}[b] = 1.515$) were also more likely to engage creatively in this project. The model explained about 3.3–5.4% of the variance in outcomes.

Table 5 shows that none of the predictors tested significantly influenced the likelihood of creating a creative drawing on the pet canvas. The model explained very little variance in drawing creativity related to pets. This suggests that creative drawings with pets may be more influenced by individual, affective, or momentary experiential factors, rather than by the demographic and situational variables measured in this study.

While this study centers on the creative and participatory dimensions of ecological art, questions related to shifts in pro-environmental awareness and personal well-being are addressed more fully in a related

project, where these themes emerged more clearly through spatial and orientation-based analysis.

4.3. Reflexivity and creative drawings

Unlike the structured questionnaire I administered in the field, the circle drawing activity—conceived as an ecological art project—proved to be a transformative experience for me, with participants' creative drawings standing out as a particularly meaningful highlight. During my time in the field, I had the opportunity to observe these drawings closely and engage participants in conversation whenever something piqued my interest. Initially, I believed that, as a researcher, I should maintain a certain distance from participants and allow them the space to express themselves freely through their drawings. However, I soon realized that these drawings were not only personal expressions but also contributions to a collective research endeavor, intended to be shared with both myself and the broader academic community. This realization prompted me to incorporate brief communicative sessions with participants, asking them to explain the meanings behind their drawings.

One especially memorable instance involved a young man who was just leaving the Panda Base. I asked him

Table 4. Binary logistic regression of creative drawings for the panda canvas

Values (modalities)	<i>b</i>	S.E.	Wald	df	Sig.	Exp (<i>b</i>)	95% C.I. for Exp (<i>b</i>)	
							Lower	Upper
Age (ref: >55)	-	-	24.060	5	0.000	-	-	-
<18	0.255	0.378	0.455	1	0.500	1.290	0.616	2.704
18–25	0.894	0.304	8.660	1	0.003	2.444	1.348	4.431
26–35	0.210	0.300	0.491	1	0.484	1.234	0.685	2.221
36–45	−0.306	0.410	0.560	1	0.454	0.736	0.330	1.643
46–55	−0.037	0.404	0.008	1	0.927	0.964	0.437	2.128
Gender (ref: Female)	-	-	-	-	-	-	-	-
Male	−0.298	0.171	3.042	1	0.081	0.742	0.531	1.038
Residence (ref: Other)	-	-	3.812	2	0.149	-	-	-
First-tier	0.415	0.214	3.776	1	0.052	1.515	0.996	2.303
Chengdu	0.048	0.222	0.046	1	0.830	1.049	0.679	1.621
Visiting frequency (ref: Returned)	-	-	-	-	-	-	-	-
1 st -time visitor	−0.251	0.210	1.430	1	0.232	0.778	0.516	1.174
Visitation stage (ref: Leaving)	-	-	6.285	2	0.043	-	-	-
Entry	−0.178	0.259	0.476	1	0.490	0.837	0.504	1.389
At the enclosure	0.310	0.198	2.448	1	0.118	1.364	0.925	2.012
Pet ownership (ref: Yes)	-	-	-	-	-	-	-	-
No	−0.037	0.161	0.051	1	0.821	0.964	0.703	1.322
Constant	−1.780	0.375	22.531	1	0.000	0.169	-	-

Notes: Model summary: $-2 \log \text{likelihood} = 1062.425$; Cox and Snell $R^2 = 0.033$; Nagelkerke $R^2 = 0.054$.

Abbreviations: C.I.: Confidence interval; df: Degrees of freedom; S.E.: Standard error; Sig.: Significance.

why he had drawn his circle to the left of the panda figure when most participants placed theirs on the right. With a laugh, he explained that he had only managed to see the back of the pandas during his visit. This moment of shared humor highlighted the nuanced, affective responses that structured questionnaires often fail to capture—insights revealed not through ticked boxes, but through art and dialogue. In some cases, participants drew a fence between the giant panda and the circle—or creatively placed the circle outside the boundaries of the canvas—offering a visual metaphor for the visitor experience. When I asked a young woman about the zigzag line she had drawn between the panda and the circle, I began to realize that the physical barriers present at every panda enclosure had become a symbolic and embodied aspect of the panda-viewing experience.

Guided by my Western academic training, I initially expected the circle drawing exercise to yield results similar to those documented in previous studies,^{e.g.27,34} grounded in the philosophical paradigm of the CNI. However, time and again, participants shared alternative narratives—rooted in their lived experiences and shaped by Chinese cultural and philosophical traditions—that added new layers of meaning to their drawings. In the nature canvas,

several participants began by drawing a small circle inside a flower and a larger circle surrounding it. They explained that the drawing represented the concept of *tianren heyi* (天人合一)—the unity of heaven and humanity—and a state of coexistence expressed as “I am in nature, and nature is in me” (我在自然中, 自然中有我). One elderly male participant elaborated that his drawing, in which eight small circles surrounded a central flower, symbolized the Eight Trigrams (*bagua*), representing a harmonious and balanced existence within nature’s energetic field. Living in harmony with nature emerged as a recurring theme in participants’ interpretations—a reflection of enduring Confucian ideals still prevalent in contemporary Chinese society.^{46,47} As the fieldwork progressed, it became increasingly clear that returning to the foundations of Chinese philosophy and cultural context was essential for a fuller understanding of the participants’ artistic expressions and the meanings they conveyed.

Pet owners, in contrast, were eager to talk about their animals, and many conversations began with my question, “Do you have a dog or a cat?” or the participant’s correction: “The canvas shows a dog, but I have a cat—a big, fat one—at home.” Owners frequently expressed deep affection for their pets, using symbols, such as hearts, hands, and arrows,

to convey their emotional connection. Some drawings featured a line linking the circle to the dog, symbolizing the leash as a medium of connection and control. Across these visual elements, participants reflected on their sense of responsibility toward their pets and emphasized the role of animals as integral members of their families.

5. Discussion

5.1. Data and ecological art

The past 2 decades have witnessed the growth of creative tourism globally, as the industry shifts its focus from tangible sites to the intangible heritage of destinations. Li and Shaw⁴⁸ note that creative tourism builds on the creative economy, emphasizing tourists' participation, co-creation, and cultural exchange over passive consumption. The binary logistic regression analysis (Tables 4 and 5) demonstrates that demographic features and visitation experiences at the Panda Base influence the production of creative ecological art by tourists. While age emerged as a prominent factor affecting tourists' participatory creativity with images of nature and the giant panda, situational factors, such as visitation stages, also played a critical role, particularly in relation to the giant panda drawings.

The creativity contributed by the 1,188 participants significantly transformed the survey into an ecological art

project, enjoyed by numerous stakeholders. The statistical results reveal that participants experienced ecology and the environment through a sense of connectivity, which, in turn, shaped how they perceived and visually engaged with nature, the giant panda, and pets. The drawing task provided an opportunity to materialize this relational act, allowing participants to explore human–animal–place connections. Across the act of drawing, tourists reimagined and reconstructed the images based on their own experiences, allowing many to derive meaning from the activity. This meaningful engagement facilitated the cultivation of stewardship through personal relevance, as the artistic practice became a method for informing, making sense of, and internalizing ecological responsibility.

The tables demonstrate that creativity in ecological art does not follow a single, linear path but instead varies across diverse personal conditions, reinforcing a non-linear engagement. This result also highlights that creativity is not solely personal or individual but shared and emergent within social and ecological contexts, collectively shaped by diverse contributions. The idea—visualizing one's relationship with nature, the panda, and pets—served as the creative agent, with different tourists bringing varied motivations and capacities to the art-making process. Both the participants and the researcher played flexible roles as

Table 5. Binary logistic regression of creative drawings for the pet canvas^a

Values (modalities)	<i>b</i>	S.E.	Wald	df	Sig.	Exp (<i>b</i>)	95% C.I. for Exp (<i>b</i>)	
							Lower	Upper
Age (ref: >55)	-	-	4.271	5	0.511	-	-	-
<18	-0.560	0.621	0.814	1	0.367	0.571	0.169	1.928
18–25	0.050	0.463	0.011	1	0.915	1.051	0.424	2.603
26–35	-0.257	0.459	0.314	1	0.575	0.773	0.315	1.901
36–45	-1.336	0.829	2.597	1	0.107	0.263	0.052	1.335
46–55	-0.108	0.602	0.032	1	0.858	0.898	0.276	2.920
Gender (ref: female)	-	-	-	-	-	-	-	-
Male	-0.334	0.304	1.204	1	0.273	0.716	0.395	1.300
Residence (ref: Other)	-	-	0.418	2	0.811	-	-	-
First-tier	0.079	0.391	0.041	1	0.840	1.082	0.503	2.330
Chengdu	0.241	0.376	0.413	1	0.521	1.273	0.610	2.657
Visiting frequency (ref: Returned)	-	-	-	-	-	-	-	-
1 st -time visitor	-0.124	0.375	0.109	1	0.742	0.884	0.424	1.843
Visitation stage (ref: Leaving)	-	-	0.689	2	0.708	-	-	-
Entry	-0.273	0.446	0.376	1	0.540	0.761	0.318	1.823
At the enclosure	0.026	0.357	0.005	1	0.941	1.027	0.510	2.066
Constant	-1.343	0.606	4.903	1	0.027	0.261	-	-

Notes: ^aThe sample pool of Table 5 comprises 433 pet owners from the study. Model summary: -2 log likelihood=354.048; Cox and Snell R^2 =0.020; Nagelkerke R^2 =0.035.

Abbreviations: C.I.: Confidence interval; df: Degrees of freedom; S.E.: Standard error; Sig.: Significance.

the idea evolved through the drawings. For example, the research began with the aim of understanding tourists, but the sharing of their lived experiences with nature ultimately transformed the researcher's role. It became clear that the researcher, too, was a participant in this ecological art, experiencing its transformative power firsthand.

5.2. Affective and cultural dimensions of ecological art

The diversity and creativity participants brought to this art project touched me on both affective and cultural levels that I had not encountered in previous questionnaire-based fieldwork. As the drawing practice unfolded, I found myself increasingly enjoying this space where random tourists paused to observe and visualize their relationships with animals and the environment. This activity connected me more closely to the creative process, gradually transforming my role from a social scientist to a co-creating artist. I became deeply engaged—the ecological art emphasized interdependence, creating a web of meanings and relationships that drew me in. The participants invited me into their imaginative and emotional worlds, where laughter, amazement, surprise, and depth were shared.

This shift was challenging—I began to realize that, despite my years of active data collection and fieldwork, few of my previous studies had captured the richness that this lived art project afforded. For one, I was confronted with my cultural roots and traditions; despite the popularity of the CNI and its Western ecological and psychological frameworks, I found their limitations in the Chinese context. While the participants lived through Chinese culture and philosophy daily, it had not initially occurred to me that these perspectives—and their subtle influence on how people relate to nature—should be considered in my research framework. As participants reflected on themes of harmony, relationality, and balance through Chinese symbols and idioms, I found myself reconnecting with these values. The drawings and interviews of the participants reflect everyday understandings of nature, which may include cultural symbols, such as “the unity of heaven and humanity” (天人合一). These references are used to enrich the interpretation of participatory behavior and do not promote any particular cultural stance.

In addition, the drawing project prompted me to reconsider my own research and academic training, which emphasized the researcher's role as objective and observational. Before long, I found myself asking tourists why the circles in their drawings were placed a certain way rather than another. This artistic process encouraged me to cross boundaries and engage with my participants. Positioned as a co-creator, I began to view the project as an

art-based, culturally grounded, and emotionally attuned process, one that made sense to both the participants and me.

While this study centers on participatory art as an embodied and affective mode of engaging with wildlife, it also aligns with the broader conversations on how human–animal relations are spatially mediated and made visible. Recent studies in environmental mapping and disease ecology have demonstrated the value of remote sensing technologies in identifying ecological risk zones and understanding multispecies interactions across landscapes.^{49,50} These tools offer powerful technology-driven perspectives on animal health, vector dynamics, and habitat characteristics, often guiding surveillance and management strategies. In contrast, the participatory drawing activity explored here operates from the bottom up, capturing situated, emotional, and imaginative responses to animal presence in a specific place. By placing these perspectives in dialogue, this research suggests that creative, ground-level engagements with animals, such as the giant panda, can complement data-driven mapping approaches—especially in designing culturally responsive, community-informed models for conservation and sustainable tourism.

6. Conclusion

At the start of designing this survey, I was curious about how people would draw circles around images, such as nature, pandas, and pets. However, the research process revealed that I could not simply describe it as a scientific investigation. Instead, alternative methodological terms were needed to understand the affective and emotional moments shared by my participants and me. Ecological art and participatory creativity seem to capture the most enjoyable aspects of this study while demonstrating that the patterns of art are both accessible through science and necessary for understanding the human–nature connection.

Reflecting on my research as an ecological art project, I now see that its embodied, affective, and participatory dimensions were not simply supplemental to the scientific inquiry but central to it. By viewing both participants and giant pandas as co-creators in a shared process of meaning-making, this project shows that the panda was not a passive object of conservation but an active presence—one that inspires, shapes, and even intervenes in human perception and behavior. Given the critical conservation status of the species and the increasing challenges faced by the animal, such participatory and creative methods offer new pathways for fostering public awareness and emotional investment. As the anecdote in the introduction suggests,

this drawing experience proved not only engaging for children, students, parents, and the elderly but also meaningful in helping them reflect on coexistence with wildlife. A critical, situated art practice has the potential to support conservation beyond education or outreach; it can foster alternative ways of knowing and relating to wildlife, opening up new collaborative methodologies that benefit the panda, the organization, and the broader public. In doing so, it contributes to a shift from conservation as control toward human-nature harmonious coexistence.

Beyond providing empirical insights, the drawing activity itself emerged as a practical and accessible form of ecological art, allowing tourists to engage more deeply with their encounters with animals and nature. In turn, the giant pandas entered the scenarios of art creation through their presence and moments of encounters with tourists. Collectively, the human and non-human participants illustrated how the motif of human-nature harmony and wildlife conservation shaped the ecological imaginaries of Chinese participants. Using participatory creativity, they depicted the human-nature-panda relationship through notions of conservation and coexistence in a shared world. Individually, each participant and panda was recognized as a co-creator, not a passive respondent, contributing their personal history and context to the project.

This study shows that ecological art, performed through participatory creativity, can be a powerful tool for generating new knowledge and fostering inclusive, culturally grounded environmental discourses. In the context of wildlife tourism in China, such practices hold the potential to enrich public discourse on human-animal relations and inspire more inclusive, emotionally resonant approaches to sustainable tourism management. By foregrounding the affective and relational dimensions of tourist engagement, participatory art may complement the notion of ecological civilization in China, strengthening the public's empathy, reflection, and shared responsibility towards nature and the environment.

As environmental crises accelerate, it is increasingly important to consider the potential of ecological art. Grounded in cultural context and emotional resonance, ecological art and participatory creativity offer promising pathways for deepening public engagement, advancing ecological awareness, and building more just and reciprocal relationships with the more-than-human world. Future studies could extend this approach to different conservation, cultural, and demographic settings. While the results of this study contribute to present research on CNT, they also support the ongoing work of reconnecting humans with the places, animals, and natural world that sustain us.

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Conflict of interest

The author declares no conflict of interest.

Author contributions

This is a single-authored article.

Ethics approval and consent to participate

Ethical review and approval were waived for this study in accordance with the Measures of the People's Republic of China (PRC) Municipality on Ethical Review (https://www.gov.cn/zhengce/zhengceku/2023-02/28/content_5743658.htm, accessed on 26 November 2024). Informed consent was obtained from all participants prior to participation. For minors (under 18 years), their legal guardians were present during the consent process and provided consent.

Consent for publication

All data have been fully anonymized, and only aggregated statistical results are presented in this manuscript. As no personally identifiable information is included, a separate consent for publication was not required in accordance with ethical guidelines.

Availability of data

The data supporting the findings of this study are available from the author upon reasonable request.

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