OXFORD

BioScience, 2025, **0**, 1–4
https://doi.org/10.1093/biosci/biaf146
Advance access publication date: 0 2025
Viewpoint

Too cute to be wild: what teddy bears reveal about our disconnection from nature

Nicolas Mouquet, Nathalie Blanc, Thierry Brassac, Nicolas Casajus and Anne-Sophie Tribot

Nicolas Mouquet (nicolas.mouquet@cnrs.fr) is affiliated with MARBEC, at the Université de Montpellier, with the French National Centre for Scientific Research (CNRS), and he and Nicolas Casajus are affiliated with the Fondation pour la Recherche sur la Biodiversity, Centre for the Synthesis and Analysis of Biodiversity, in Montpellier, France. Nathalie Blanc is affiliated with the Université de Montpellier Paul-Valéry, Epsylon-LAPECS, part of the Latin American Network of the Programme on Ecosystem Change and Society, in Montpellier, France. Thierry Brassac is affiliated with the Science and Society Department at the Université de Montpellier, in Montpellier, France. Anne-Sophie Tribot is affiliated with Aix Marseille University, CNRS, Temps, Espaces, Langages, Europe Méridionale, Méditerranée, in Aix-en-Provence, France.

For many Westerners, the very first intimate, emotional bond with nature may not come from a walk in the woods but from early exposure to representations of nature, through illustrated books, toys, or plush animals. Among these, teddy bears have held a predominant place since the early twentieth century (Blanc et al. 2025). As paradoxical as it may seem, this plush is not only a source of childhood comfort but also a potential gateway to our relationship with nature. In an era marked by accelerating ecological degradation, reconnecting people, especially children, with the natural world has become a central goal of both conservation science (Soga and Gaston 2016, Chawla 2020) and environmental psychology (van Heel et al. 2023). A growing body of research shows that emotional closeness to nature in early life is a strong predictor of proenvironmental attitudes and behaviors in adulthood (Otto and Pensini 2017). If we are to rebuild our collective relationship with nature, not just cognitively but emotionally, we must attend to the sensory pathways through which this relationship first takes shape. And sometimes, what hides in plain sight can be the most instructive: Our first nature-based solution might just be a teddy bear.

As transitional objects (Winnicott 1953), teddy bears offer warmth, reassurance, and a feeling of safety during a child's earliest encounters with the world. Strikingly, the teddy bear is the overwhelmingly dominant choice among plush toys. As part of a large-scale online study (11,188 participants) conducted by Blanc and colleagues (2025) on emotional responses to teddy bears, we asked participants if they had a cuddly toy during childhood (figure 1). Among the respondents, 86.3% answered yes (9.7% answered no and 3.9% did not remember). Of those, the vast majority (83.6%) indicated that their own cuddly toy represented an animal (see the supplemental material). The teddy bear was by far the most common choice, accounting for 45.3% of the responses, followed by rabbits (13%), dogs (7%), and other animal categories such as felids, farm animals, and wild species (e.g., savanna, forest, or marine animals). These numbers highlight both the strong link between childhood comfort and the animal world (mostly mammals) and the dominant status of the teddy bear as the primary species used for emotional bonding in early life. The teddy bear represents an animal form that can be easily cuddled to provide comfort, security, and emotional grounding during early development. The teddy bear, through its sensory properties, also acts as a vehicle of prosocial and stress-relieving behavior: Teddy bears are now used not only in child development but also to overcome unpleasant situations such as social exclusion (Tai et al. 2011) or trauma (Bloch and Toker 2008). However, despite the widespread use and emotional impact of teddy bears, we have yet to develop a comprehensive science of their design, perception, and function. And perhaps most urgently, in a world facing an accelerating biodiversity crisis, understanding among our early emotional gateways to nature may hold the key to cultivating lifelong bonds with the living world. But, paradoxically, the very identity of the teddy bear itself has largely been unquestioned.

In two complementary studies (Tribot et al. 2024, Blanc et al. 2025), we investigated the sensory of emotional responses to teddy bears. In the first, a participatory experiment involving nearly 400 individuals, we found that perceptions of comfort were primarily driven by kinesthetic and olfactory features, most notably the softness and tactile appeal, as well as the plush's smell. Morphological traits such as body volume and muzzle size also contributed, especially in the absence of an emotional bond. Building on these findings, a second large-scale online study with over 11,000 participants quantified how visual cues alone shape emotional responses to teddy bears across three dimensions: beauty, comfort, and care motivation. We found these dimensions to be highly correlated and statistically reducible to a latent variable—cuteness. Using image-based analysis, we demonstrated that cuteness was best predicted by perceived softness, as well as by colorimetric variables. Children's preferences diverged from those of older adults', with younger participants showing greater attraction to highly color saturated, nonstereotypical teddy bears, including those with bright colors. In contrast, older adults preferred more traditional forms marked by neutral palettes and simple, well-balanced forms. Juvenile morphological traits such as large muzzles and eyes, recognized as caregiving triggers, showed a hump-shaped relationship with perceived cuteness, with intermediate trait values being rated as the most appealing. Overall, these studies reveal that not all teddy bears are equal and that cuteness, far from being a vague or subjective notion, is a quantifiable property tied to precise morphological and visual traits.

Given these findings, an important question arises: How do the traits that explain emotional attachment to teddy bears

Received: July 23, 2025. **Revised:** August 8, 2025. **Accepted:** August 15, 2025

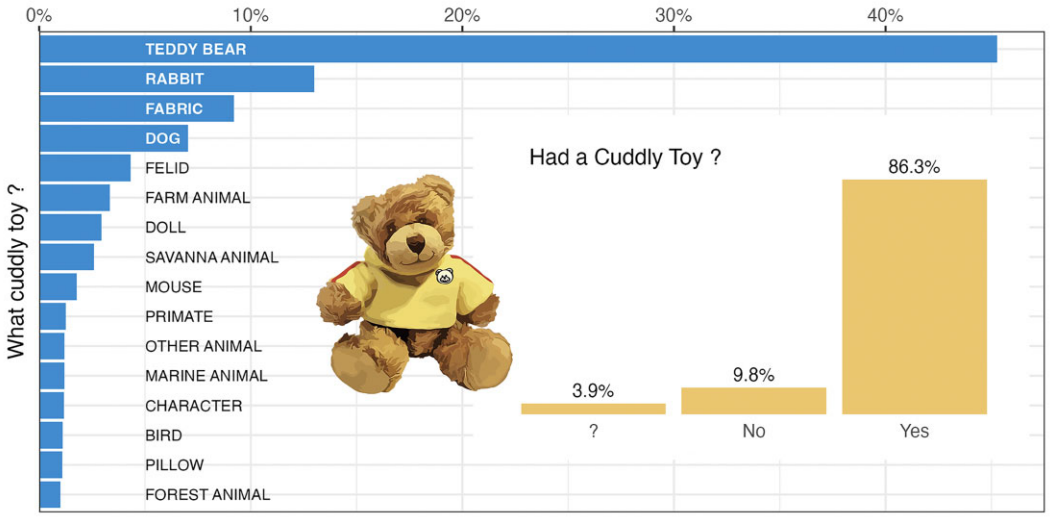

Figure 1. Prevalence and typology of cuddly toys. Responses to the question "Did you have a cuddly toy?" (yes; no; or ?, which signified that they don't remember) in the large-scale online survey (11,188 participants) conducted by Blanc and colleagues (2025). The horizontal bar chart displays the relative frequency of cuddly toy categories among those who answered "yes" (see the supplemental material for details on categorization). Image: (*Nunursus calinus*) by Philippe Azzaretti.

relate to the very species they are meant to represent? How faithful are they to their natural counterpart? Addressing these questions might shed light on how early exposure to animal representations shapes our emotional bonds with nature and whether these connections are grounded in ecological reality. To explore this, we compared the morphometric and colorimetric traits of the 436 teddy bears used previously (Blanc et al. 2025) with those of all extant bear species (figure 2). We performed a principal component analysis on 436 teddy bears using the morphocolorimetric traits from Blanc and colleagues (2025) that were shown to explain the perceived cuteness (see the supplemental material). The cutest teddy bears are located in the upper right of the principal component analysis axes 1 versus 3 relationship (figure 2), characterized by large chests, juvenile muzzle (large muzzle relative to the size of the head), thick or long fur, homogeneous coloration and long front legs (arms). We measured the same variables for the 11 real-world bear species and subspecies (see the supplemental material) and projected them into the principal component analysis. We found that real bears form a well-defined cluster that is clearly distinct from the teddy bears (figure 2). This pattern was consistent among the respondents' age classes (see the supplemental material). This divergence is mainly found along the principal component analysis dimension 3, which is driven by juvenile appearance, with the cutest teddy bears having disproportionately large heads, muzzles, and chests. Among real bears, the giant panda comes closest to matching the traits that drive cuteness attribution in teddy bears but still deviates substantially (figure 2).

This reveals more than a design preference, it signals a divergence between the bear representations through which we form emotional bonds and the real animals that exist in nature. Rather than encouraging genuine appreciation or interest, this gap risks fostering unrealistic expectations and naive assumptions about wildlife. It echoes broader trends in the disconnection from nature. Urbanization, digital lifestyles, and declining time spent outdoors have all contributed to what researchers term the *extinction of experience*, a progressive loss of direct, meaningful interactions with the living world (Soga and Gaston 2016). In the domain of childhood toys, this disconnection is reinforced. The further the teddy bear diverges from its biological counterpart, the greater the risk that children grow up with warped or incomplete mental representation of animals and ecosystems. Such distortions can have real and unpredictable consequences. Just as critics have argued that zoos can project a biased image of nature, detached from ecological realities (Jensen 2014), so too can plush toys mislead. When children's early emotional templates for nature are dominated by idealized forms, their later views on biodiversity, conservation, and animal behavior may be rooted more in aesthetic biases (e.g., Mouquet et al. 2024) and imaginary referential than ecological reality. Unrealistic representations can shape public engagement in ways that, although they are well meaning, may be ecologically naive and misleading (Courchamp et al. 2018).

If the teddy bear is indeed among the child's first nature encounter, then our early emotional bond with an imaginary bear may set the foundation for how we later relate to wildlife. What does this mean for action? It means that fostering emotional connections to nature must begin far earlier than we currently assume (Ardoin and Bowers 2020). In parallel to nature-based solutions that leverage ecosystems for human benefit, teddy bears reminds us that such "solutions" must also encompass the emotional and developmental pathways through which people learn to value nature (Cohen-Shacham et al. 2016). By understanding and leveraging the characteristics that make teddy bears powerful emotional tools, we can enhance not only individual well-being but also collective care for the planet. They cultivate emotional capacities—comfort, empathy, protection—that later foster broader nature connections. But this gateway should be aligned with ecological realities. If the bear that comforts a child looks nothing like a real bear, the emotional bridge it builds may lead away from, rather than toward, true biodiversity. Designers and educators should therefore reflect on the visual and tactile traits embedded in the plush toys we offer children. More generally, diversifying the plush palette to include ecologically grounded forms, species with more accurate morphologies and colorations, could help restore some alignment between

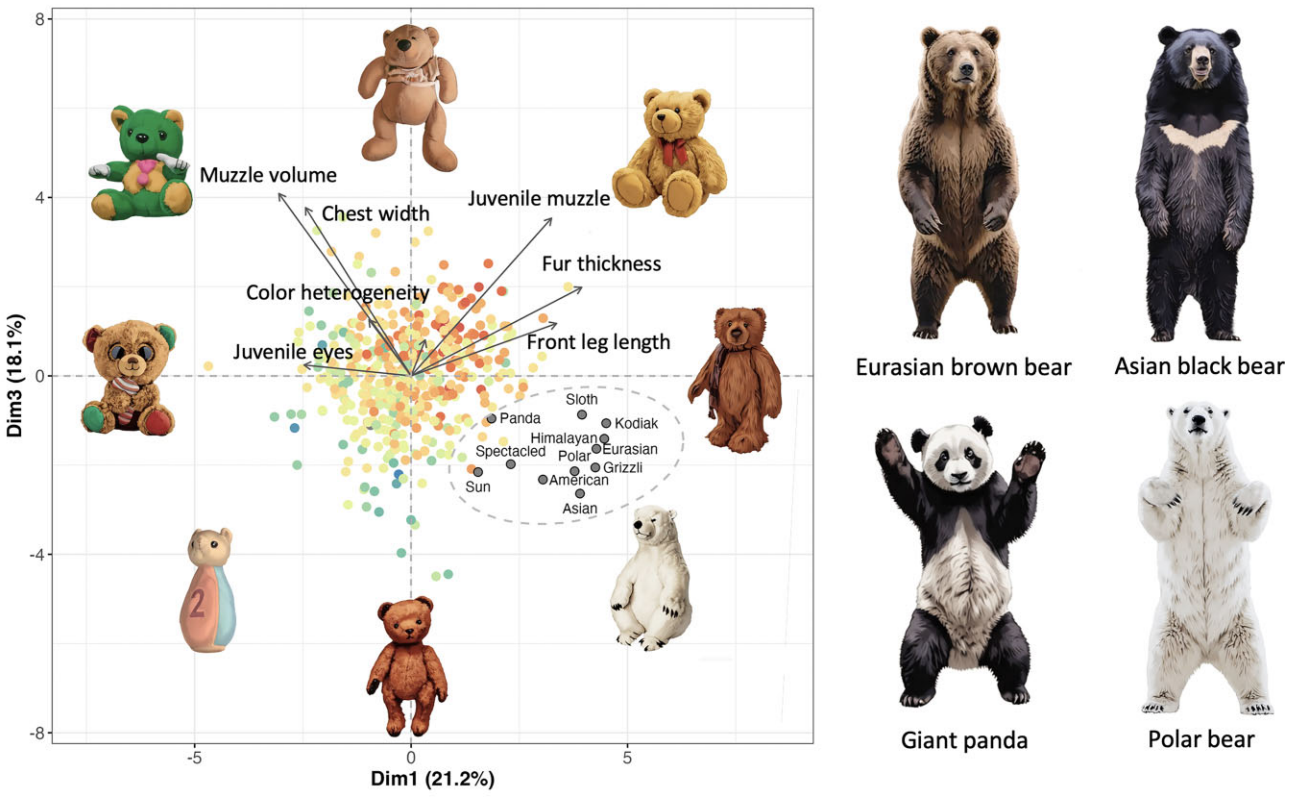

Figure 2. Morphological and colorimetric comparison of teddy bears and real ursid species. Principal component analysis of 436 teddy bears based on morphometric and colorimetric traits (see the supplemental material for a full description of the methods). Arrows indicate the contribution of key traits to the first and third principal components, which together explain respectively 21.2% (Dim1) and 18.1% (Dim3) of the variation and are correlated with cuteness index (points are colored from low-dark green to high-red cuteness values). The plot includes vectors (the arrows) for the main morphometric and colorimetric traits, illustrating how each trait contributes to the separation along the first and third principal components. Real bear species (the gray dots) are projected into this morphocolor space, falling outside the cluster of teddy bears. Examples of teddy bears representative of the different regions of the morphocolor space are shown on the plot. Four real bears are shown on the right for illustration: The Eurasian brown bear (*Ursus arctos arctos*), the Asian black bear (*Ursus thibetanus*), the giant panda (*Ailuropoda melanoleuca*), and the polar bear (*Thalarctos maritimus*). Note that, for visual clarity, we did not label the vector color saturation (the smallest arrow). Images: All drawings have been produced digitally by the authors and are copyright free.

emotional connection and biological reality. Enhancing the emotional relevance of biodiversity through tangible objects offers indeed a low-tech, high-impact complement to traditional conservation outreach.

By decoding the emotional blueprint of one of the most beloved childhood companions, we can not only explore an important frontier in environmental psychology (Chawla 2020, van Heel et al. 2023) but also offer new tools to strengthen our relationship with nature. To do so, we need to foster a better dialogue between many scientific fields such as psychology, ecology, design, cognitive science, and conservation biology, uniting empirical inquiry with the profound questions of how nature representations mediates our real-world connections. As biodiversity collapses and ecological alienation deepens (Soga and Gaston 2016), restoring the human–nature bond has become a planetary challenge. To face it, we must recognize the subtle, everyday interfaces that nurture or erode that bond. Teddy bears are one of those interfaces. Far from being trivial, they are mediators of care, empathy, and affection, totems through which we may cultivate pronature values. But only if we ask which teddy bear. In that question lies a forest of understanding, hidden behind a single plush. Some of the tools to address our disconnection from nature are already in our arms, but they must be wielded wisely.

Acknowledgments

We would like to thank the thousands of volunteers who participated in the online questionnaire "Mission NOUNOURS" hosted on the Biodiful platform (https://www.biodiful.org). The Biodiful platform received funding from the LabEx CeMEB. Warm thanks to Philippe Azzaretti, who provided the drawing of *Nunursus calinus* shown in the figure 1. All data and code needed to evaluate the conclusions in the article are present in the corresponding git repository: https://github.com/nmouquet/NOUNOURSUSvsBEARS

Supplemental data

Supplemental data are available at *BIOSCI* online.

References cited

Ardoin NM, Bowers AW. 2020. Early childhood environmental education: A systematic review of the research literature. *Educational Research Review* 31: 100353.

Blanc N, Tribot A-S, Brassac T, Mouquet N. 2025. The science of cuteness: Where teddy bears' beauty, comfort and care converge.

Journal of Positive Psychology 20: 2538890. https://doi.org/10.1080/17439760.2025.2538890

Bloch YH, Toker A. 2008. Doctor, is my teddy bear okay? The "Teddy Bear Hospital" as a method to reduce children's fear of hospitalization. *Israel Medical Association Journal* 10: 597–599.

Chawla L. 2020. Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss. *People and Nature* 2: 619–642.

Cohen-Shacham E, Walters G, Janzen C, Maginnis S. 2016. *Nature-Based Solutions to Address Societal Challenges*. International Union for Conservation of Nature.

Courchamp F, Jaric I, Albert C, Meinard Y, Ripple WJ, Chapron G. 2018. The paradoxical extinction of the most charismatic animals. *PLOS Biology* 16: e2003997.

Jensen E. 2014. Evaluating children's conservation biology learning at the zoo. *Conservation Biology* 28: 1004–1011.

Mouquet N. 2024. Low human interest for the most at-risk reef fishes worldwide. *Science Advances* 10: eadj9510.

Otto S, Pensini P. 2017. Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change* 47: 88–94.

Soga M, Gaston KJ. 2016. Extinction of experience: The loss of human–nature interactions. *Frontiers in Ecology and the Environment* 14: 94–101.

Tai K, Zheng X, Narayanan J. 2011. Touching a teddy bear mitigates negative effects of social exclusion to increase prosocial behavior. *Social Psychological and Personality Science* 2: 618–626.

Tribot A-S, Nathalie B, Thierry B, François G, Nicolas C, Mouquet N. 2024. What makes a teddy bear comforting? A participatory study reveals the prevalence of sensory characteristics and emotional bonds in the perception of comforting teddy bears. *Journal of Positive Psychology* 19: 379–392.

van Heel BF, van den Born RJG, Aarts N. 2023. Nature experiences in childhood as a driver of connectedness with nature and action for nature: A review. *Ecopsychology* 15: 354–367.

Winnicott DW. 1953. Transitional objects and transitional phenomena: A study of the first not-me possession. *International Journal of Psychoanalysis* 34: 89–97.

Received: July 23, 2025. **Revised:** August 8, 2025. **Accepted:** August 15, 2025