

# Sustainability & connectedness to 'nature': Tracking the under-represented impact of cultural diversity & spatiotemporal proximity

Working Paper

Ryan Rabett (r.rabett@qub.ac.uk)

Queen's University Belfast / IHCLA, American College of Greece

## Abstract

*International advisory science demonstrates with increasing certainty that the current climate and biodiversity crises facing the planet are the consequence of human activity. Governmental and societal awareness of this is now widespread. Advocacy of individual and local action for the collective good at all stages of life has become mainstream and a maxim for people and institutions to align routines, activities and policies in order to achieve more sustainable lifestyles. While thinking globally and acting locally has long been presented as a navigable channel between the small (e.g., personal) and the large (global) scale aspects of this relationship, very little is known about how individual motivation is affected by cultural and spatiotemporal variability. This paper reviews the current state-of-the-art regarding human connectedness to nature and makes provisional suggestions about how to accommodate the effects of cultural diversity and spatial and temporal remoteness pursuant to a more sustainable relationship between people and the natural environment.*

## Introduction

If weight of evidence can be taken as a measure of accountability, the thousands of pages of evidence amassed through multiple reports by the International Panel on Climate Change (IPCC) provide an ever-more water-tight case of human culpability behind what is now been formally defined as a *Climate and Ecological Emergency* (e.g., [ICOMOS 2020 resolution 20GA/15<sup>1</sup>](#)). Examining the way that people engage with the environment and how responsible and sustainable attitudes can be fostered through education, life-long learning and policy has become central to achieving lasting social change, capacity building and a re-orientation of cultural values to address the enormity of the challenge that this emergency presents (e.g., [Reid 2021](#); [UNESCO 2021b](#), [WEF 2016](#)). One of the principal ways that this relationship has been made accessible is by advocating connection between small and large scale concerns. This long-established ([Gerlach 1991](#)) visible and relatable route plays out between personal action and responsibility, on the one hand, and global conditions on the other – but also and increasingly as a way of devising contextually appropriate and sustainable responses to the unfolding state of the world's climate and biodiversity ([MEA 2005](#)) – provides demonstration of how scalar considerations are central in the drive for sustainability.

However, despite the continued visibility of local : global narratives, and efforts to articulate and incorporate human connectedness to nature into mainstream thinking, variability in how people relate to and identify with the environment cross-culturally, and across space and time are still poorly-served. This paper begins by briefly reviewing existing approaches and limitations to quantifying nature connectedness in respect to these dimensions. It then explores the potential of cultural ecological services and utility of learning domain categories to help better account for cultural and spatiotemporal variability, with the aim of helping to tailor initiatives and better leverage affirmative action in environmental learning and in meeting global objectives on sustainability.

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<sup>1</sup>[https://www.icomos.org/images/DOCUMENTS/Secretariat/2020/Cultural\\_Heritage\\_and\\_the\\_Climate\\_Emergency-Resolution\\_20GA\\_15\\_.pdf](https://www.icomos.org/images/DOCUMENTS/Secretariat/2020/Cultural_Heritage_and_the_Climate_Emergency-Resolution_20GA_15_.pdf)

## Measuring human connectedness to nature

People's perceived connectedness to the natural environment is a crucial component of sustainability science (Brown et al. 2019), environmental education programmes (Barrable 2019; McPherson Frantz & Mayer 2014; Otto & Pensini 2017; Reid et al. 2021), and an important predictor of ecologically minded behaviour and subjective well-being (MEA 2005; Mayer & McPherson Frantz 2004; Nisbet et al. 2011). Efforts to quantify and assess aspects of this relationship have led to the development of various instruments that for the most part revolve around measuring outdoor experiences. These include, for example, the *Inclusion of Nature in the Self* (INS) (Schultz 2001), *Connectedness to Nature Scale* (CNS) (Mayer & McPherson Frantz 2004), *Nature Relatedness* (NR) (Nisbet et al. 2009), and the *Connectedness to Nature Index* (CNI) (Sobko et al. 2018). Through participant responses, all examine one or more of essentially three components: 'Cognitive' (awareness or understanding of being part of nature), 'Affective' (i.e., emotional sensitivity to protecting the environment) and 'Behavioural' (i.e., levels of engagement or action in protecting nature) (Sobko et al. 2018).

However, while variables such as ethnic diversity in sample populations are recorded (e.g., Nisbet & Zelenski 2013), attention to cross-cultural comparisons has been limited (e.g., see Schultz 2001; Tam 2013) and instances where instruments have been designed and applied in a non-Western setting are still rare (e.g., Duong & van der Born 2019; Sobko et al. 2018). While cautionary remarks have been made about the way people from different cultures perceive relatedness to the environment (Tam 2013), there is little indication that the relevant literature currently contains significant levels of historically or anthropologically-backed analysis to expand on the relevance of ethnographic or traditional context. Indeed, Beery & Wolf-Watz (2014) point out that a persistent issue with existing measures is that they seek to quantify human response to a generalised and non-specific concept, 'nature', with no evident attention to the socio-cultural construction of this term (e.g., see Evernden 1992).

Spatial proximity has been incorporated into studies, but emphasis has been placed on the importance of being *in* nature. For example, through accessibility to private gardens and/or neighbourhood natural spaces in the socio-emotional and behavioural development for young children (4-6 year-olds) (Richardson et al. 2017); or through questionnaire items exploring the attractiveness of experiences in remote natural settings (e.g., Nisbet et al. 2009). Placing attention on either close proximity in the first of these examples, or unspecified but distant proximity in the latter example. Accessing and quantifying variability in perceived connectedness to place across spatial scales has received limited attention beyond such categorisation (e.g., Brown, G. et al. 2015, Brown, K. et al. 2019).

Systematic examination of diachronic variability in perceptions of connectedness also appears under-represented. Studies tend either to emphasise validation by establishing temporal stability in participant responses over short periods of time (e.g., weeks), or are concerned with the longer, but still restricted interval of children's scholastic careers (with the aim of instilling pro-environmental attitudes and promoting sustainable lifeways into adulthood). While attention to the future is a recurrent characteristic of instruments, through proposed applicability, there is minimal input from the past. That said, the prominence that the climate and biodiversity emergencies has attained over the last decade through government, community, media, and scholarly reporting has led to an upscaling in temporal perspective, with greater emphasis placed on the role of humans as agents and recipients of change within arcs spanning timescales from the near-present up to species level timeframes and beyond. This is particularly evident in headline or summary statements.

'...Nature is declining globally at rates unprecedented in human history,' (UNESCO 2021a: 2).

*'What happens in the next several years – a mere nano-second in the expansive history of the Earth – may set us on a nightmarish course of living with an increasingly volatile and dangerous climate; or with a climate that will change, but with less severity and remain relatively hospitable to humans,'* (UNESCO 2021b: 31).

As powerful as such statements are though, they rarely translate into methodical consideration of how surveyed respondents relate to chronologically remote points of reference any more than they do variability in perception between different cultural traditions or differing geographic situatedness.

*'There is considerable uncertainty with regards to the importance people in different cultures place on cultural services, how this changes over time, and how it influences the net costs and benefits of trade-offs and decisions,'* (MEA 2005: 102).

*'[There is] a need to recognize the value of incorporating a diversity of socio-ecological framings used by different epistemic communities in sustainability science and more broadly,'* (Ellis et al. 2019: 89).

**In sum, current connectedness indices appear to be statistically articulating a relationship that takes almost no account of the cultural construction of 'nature' and only restricted account of spatiotemporal context.** This does not at all invalidate such instruments as a means for tracking the dynamics of human-environment interaction. Rather, the argument is that more explicit attention to these dimensions has the potential to better contextualise the results such measures reveal, provide greater explanation of observed variability, and in so doing, enhance their validity and applicability.

## 1. Integrating Cultural Services

The cultural services that ecosystems provide *Homo sapiens* have shaped our socio-cultural niche and the ecological impact we have had through-out the history of our species (e.g., Ellis 2015). Currently though, while Cultural Services are acknowledged as an important category of Ecosystem Services, sub-headings under this title tend to focus on a range of 'non-material' domains (Daniel et al. 2012). For example, recent tabulation of the range of Ecological Services (Schipper et al. 2022: 2694) lists three sub-headings under Cultural Services as: '*Learning & Inspiration*', '*Physical & Psychological Experiences*' & '*Supporting Identities*'; categories drawn from the Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) examination of 'Nature's Contributions to People' (Brauman et al. 2019) and from MEA (2005). The separation of Cultural Services from provisioning, regulating, and supporting categories can give the impression that cultural perceptions can be ring-fenced and do not permeate and/or inform other service categories. This is not the case; and overlap between ecosystem service categories is recognised (MEA 2005: 120). Though we are reminded that it has been the pursuit to clarify *human agency* in 21<sup>st</sup> Century climate change that lies at the core of the IPCC work since its inception (UNGA43-53 1988: 133-134<sup>2</sup>), suggesting that such separation may be convenient but not productive. In-depth investigation, producing increasingly refined and robust conclusions that affirm human causality, has been predominantly concerned with the identifying and quantifying agency and consequence; very little attention has been paid to the cultural processes that drove and continue to drive these actions (Daniel et al. 2012). With few recent exceptions (e.g., Cheng et al. 2019; Zhao et al. 2020) substantive attention to Cultural Services in general, and to quantitative analysis of spatiotemporal variability in particular, is as scarce now as it was twenty years ago.

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<sup>2</sup> <https://www.ipcc.ch/site/assets/uploads/2019/02/UNGA43-53.pdf>

In other words: **The key causal agent to the present climate and biodiversity emergencies, and a critical component of the response narrative – namely: humans and how we relate to the natural world – is still significantly underdeveloped.** The current low coverage of Cultural Services in the advisory literature equates to an opportunity missed to better understand how people engage with the environment; to establish tailored programmes of best-practice; and to realign individual and group action towards sustainable practices (UN 2015); a need that contextually situated measures of nature connectedness can readily fill. Simply telling people what they need to do is rarely adequate, as studies assessing the transferability of knowledge demonstrate (Do et al. 2020; Kaplan 2000).

While geographic variability in Cultural Services is noted in the advisory literature, and there is qualitative incorporation of it into some predictive models (e.g., MEA 2005: 120); of the four major headings used to describe Ecosystem Services – i.e., ‘Provisioning’ (e.g., food & materials), ‘Regulating’ (e.g., climate, air quality etc.), and ‘Supporting’ services (e.g., pollination & habitat creation), Cultural Services are recognised to be the least developed and in need of attention.

*‘There are relatively few models of the relationship between ecosystem services and human well-being,’ (MEA 2005: 102).*

*‘The results of the systematic literature review highlight the scarcity of global or continental scale scenarios addressing non-material contributions to people: these have received far less attention than material and regulating NCP [‘Nature’s Contributions to People’]. Even on the local scale, the number of scenario studies dealing with the category of cultural ecosystem services is limited,’ (Shin et al. 2019: 670).*

## 2. Extending learning domain analysis

The UNESCO (2019) report ‘*Educational Content Up Close*’ sifted through content from a wide range of national laws, policies and intended curricula relating to Pre-Primary, Primary, Lower Secondary and Upper Secondary Education across a sample of countries. It did not consider Tertiary, Adult or Non-formal education. It divided the percentage occurrence of referential points under three broad learning domains (below).

- **Cognitive** - comprising knowledge and critical thinking skills necessary to better understand the world and its complexities (after UNESCO 2015, 2017).
- **Social & Emotional** – taken to include skills, attitudes, values and self-reflection that enable collaborative, negotiating and creative integration, and
- **Behavioural** – related to compassionate and respectful action and the building of constructive sustainable relationships in the context of community norms and wider social standards.

These find useful correspondence with the categories most frequently presented in studies of nature connectedness; can be employed to break down environmental learning into different domains of engagement; and measure how proportional relevance changes in children and young people as they move through the educational system, into life-long learning in the context of different socio-cultural systems. The two principal findings of the UNESCO (2019) study are particularly pertinent to such application:

*‘Throughout education levels, the focus on the cognitive increases, while the focus on the social and emotional decreases,’ (UNESCO 2019: 13).*

*'There is considerable variation across countries regarding the relative emphasis on the three learning dimensions in ESD and GCED,' (UNESCO 2019: 14).*

### 3. Innovating measures of cultural, temporal & spatial relatedness

Drawing on a concept such as 'identification' (Naess 1987) as an operative means of differentially expressing cognitive, affective and behavioural connections to the natural environment, attention can be given to how people identify with phenomena in the natural world (or effecting the natural world) that lie at increasing levels of remoteness from them and how this relatedness changes cross-culturally. The items listed below introduce three inter-related dimensions of variability. The context of cultural perception is intended to capture familiarity with nature conceptualisation and provide lines for such a cross-cultural comparison (e.g., Duong & van der Born 2019; Ntanos et al. 2019; UNESCO 2021b); spatial perceptions relate to recent work connecting empathy and sustainability (e.g., Brown et al. 2019; Daryanto & Song 2021; Gosling & Williams 2010); and temporal perception drawing on Educational, Historical, Archaeological and Human Palaeoecological studies (e.g., Chawa 2020; Fawcett 2011; Rabett et al. 2023; Silva et al. 2022).

The 18-item measure presented here must be seen as preliminary only. It is not presumed to be either comprehensive or complete. Items are worded to access Affective (emotional), Behavioural and Cognitive components, broadly following Sobko et al. (2018) and aligned to learning domains presented in UNESCO (2019) and are not considered to be mutually exclusive. The expectation is that respondent answers would be quantified through the same Likert scale – ranging from 1 (Agree strongly) to 5 (Disagree strongly) – as other nature connectedness studies.

- **Affective** – Identification through emotions, comprising a perceived personal level of connection (e.g., an extended/inclusive sense of 'self'); self-reflection, sensitivity towards protecting the natural environment or culturally prioritised aspects of it.
- **Behavioural** – Identification through actions, informed or shaped by enculturated values, attitudes or beliefs regarding the natural world and the place of humans within it. Includes, field-based instruction.
- **Cognitive** – Identification through intellectual (chiefly objective though still enculturated) levels of abstract engagement with the natural environment and the place of humans place within it; includes aesthetics, as well as formal class-based instruction.

#### Draft example #1: Cultural perceptions

- Traditional cultural values connect me to the natural world.
- I feel there is a 'sacredness' to some parts of the natural world more than others.
- The best way to conserve natural systems is to remove humans.
- Economic and societal concerns of daily life are more important to me than nature.
- I think of 'nature' and 'culture' as separate things.
- The aesthetic appeal of a natural setting can be enhanced by human design.

### Draft example #2: Spatial perceptions

- When I learn about environmental damage to a location that is physically close to my home, I feel a personal sense of loss.
- Any connection I might feel to environmental damage in another part of the world that I have not visited tends to fade shortly (days) after I learn about it.
- Environmental damage to a location in another part of the world (country) that I have visited prompts me to take supportive action (e.g., donate money).
- When I learn about environmental damage to a location in another part of the world (country) that I have not visited I am less inclined to help.
- Witnessing environmental damage first-hand impacts my thinking long after the event itself.
- Secondary experience of environmental damage (e.g., through media) affects my long-term thinking and outlook.

### Draft example #3: Temporal perceptions

- As a young child (4-6 years old) I felt very connected to the natural world.
- The way I relate to the natural world became less emotional and more intellectual after I had become a teenager.
- As an adult, I feel a responsibility towards helping to ensure a sustainable future.
- I am still learning about the natural world and my place in it.
- The historical past (last 2000 years) provides only scientific context and meaning to present-day environmental concerns; it does not affect my feelings or actions.
- The remote past (>2000 years) provides only scientific context and meaning to present-day environmental concerns; it does not affect my feelings or actions.

### Conclusion

A strong positive correlational relationship is reported between connectedness to nature and the development of environmentally responsible behaviour (Frantz & Mayer 2014). The promotion of such an outlook forms an important part of global learning initiatives, such as Education for Sustainable Development and Global Citizenship Education (UNESCO 2015,2017, 2021b; WEF 2016) that seek to embed environmental education through-out the education sector (Reid et al. 2021) and highlights to significance of research in this field.

With the intention of helping to progress our understanding about the dimensions of variability that affect human perception of the natural environment, this review has sought to highlight the value and some limitations inherent in current approaches to measuring nature connectedness. It has demonstrated both the relevance but also the restricted level of attention that has been given to, cultural ecological services, spatial and diachronic ranges. It does not presume that these constitute the only under-represented dimensions that might be incorporated more explicitly into the next generation of instruments. Gender variability in environmental connection and recollection (e.g., Chawla 2020; Occhoonera et al. 2023) is another such area, for example.

The paper concludes with preliminary suggestions for measures to interrogate how cultural variability, and scales of increasing spatial and temporal remoteness from the respondent affect perceptions of nature connectedness. Effective incorporation of these dimensions will require greater communication between research disciplines: from the geographical and environmental sciences and psychology, through to social science and humanities disciplines (UNESCO 2021b) – including, but not restricted to History, Archaeology and Anthropology. In that context, further refinement of questionnaire items, testing (including, in controlled cross-cultural settings, e.g., Western vs Eastern nature conceptions) and validation represent logical next steps towards greater recognition of these key variables into how we understand, promote and tailor life-long environmentally sustainable learning and engagement.

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