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A safe and just operating space for human identity: a systems perspective

Tom H Oliver, Bob Doherty, Andre Dornelles, Nigel Gilbert, Matthew P Greenwell, Laura J Harrison, Ian M Jones, Alastair C Lewis, Sarah J Moller, Vanessa J Pilley, Philip Tovey, Netta Weinstein

A safe and just operating space for socioecological systems is a powerful bridging concept in sustainability science. It integrates biophysical earth-system tipping points (ie, thresholds at which small changes can lead to amplifying effects) with social science considerations of distributional equity and justice. Often neglected, however, are the multiple feedback loops between self-identity and planetary boundaries. Environmental degradation can reduce self-identification with nature, leading to decreased pro-environmental behaviours and decreased cooperation with outgroups, further increasing the likelihood of transgressing planetary boundaries. This vicious cycle competes with a virtuous one, where improving environmental quality enhances the integration of nature into self-identity and improves health, thereby facilitating prosocial and pro-environmental behaviour. These behavioural changes can also cascade up to influence social and economic institutions. Given a possible minimum degree of individual self-care to maintain health and prosperity, there would seem to exist an analogous safe and just operating space for self-identity, for which system stewardship for planetary health is crucial.

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School of Biological Sciences (Prof T H Oliver PhD, A Dornelles PhD, M P Greenwell PhD, Prof I M Jones PhD) **and School of Psychology and Clinical Language Sciences** (N Weinstein PhD), **Whiteknights Campus, University of Reading, Reading, UK; School for Business and Society** (Prof B Doherty PhD), **Department of Environment and Geography** (L J Harrison PhD), **and National Centre for Atmospheric Science** (Prof A C Lewis PhD, S J Moller PhD), **University of York, York, UK; Department of Sociology, University of Surrey, Guildford, UK** (Prof N Gilbert PhD); **Systems Innovations and Futures Team, Chief Scientific Adviser's Office, Department for Environment Food and Rural Affairs, UK** (V J Pilley MSc, P Tovey MSc)

Correspondence to: Prof Tom H Oliver, School of Biological Sciences, Whiteknights Campus, University of Reading, Reading, RG6 6AS, UK
t.oliver@reading.ac.uk

Introduction

Environmental and social issues cannot be effectively understood in isolation because they are linked within complex interacting systems. Feedback processes are increasingly recognised to hinder effective solutions to social problems, such as persistent poverty,[1,2] racial disparities,[3] and depression.[4] These processes are sometimes referred to as vicious cycles, whereby a self-reinforcing feedback loop makes a negative state persist or worsen.

Vicious cycles are also thought to exist in environmental systems, such as how climate change both causes and is itself exacerbated by ice sheet melting and forest dieback.[5] Little is known about how systemic feedback processes link social systems and natural systems together. There might be complex non-linear interactions that lead to environmental change accelerating or slowing in ways that we do not understand and are thus ill equipped to deal with. A key aspect underpinning how social systems influence environmental systems is people's sense of self-identity (ie, the integrated image of themselves as a unique person),[6] which is determined by a complex interplay of social context and individual history.[7] Self-identity is ultimately linked to behaviours, including those associated with protecting or damaging the environment.[8] Equally, the behaviours of those around us affect our self-identity and, relatedly, what we find important: we are shaped by the social norms that we are exposed to and the corresponding values (ie, abstract ideas of what is important to us that guide our behaviour) and goals (ie, concrete aims we set based on those values) that we hold and expect others to hold.[9,10] For example, social norms that favour environmental conservation positively shape our self-identity and the values that we hold; but if we judge that others are disproportionately focused on self-enhancement values that place importance on attaining power or achievement), then the feeling of efficacy around environmental efforts is undermined.[11]

Researchers have long discussed both values and self-identity as key factors in global sustainability,[12,13] although both are neglected if government policy focuses predominantly on structural (eg, technological or economic) solutions. This Review focuses on interactions between self-identity and its corresponding values and the state of the natural environment, with the aim of developing improved understanding to allow effective and strategic stewardship of planetary health.

Changes in self-identity and environmental quality: locked in a vicious cycle?

Self-identity as a driver of environmental degradation

The way that we view ourselves in relation to others and the natural world has important implications for the state of the global environment, largely because self-identity is closely tied with the values that we hold. For example, private materialism (ie, the importance that people place on possessions and extrinsic motivations, such as financial success)[14] can be viewed as a motivated goal pursuit that is intended to construct and maintain self-identity,[15] whereas individualism (ie, the idea that each person should think and act independently with less responsibility for others) is related to values of self-transcendence versus self-enhancement,[10] which are in turn related to self-identity.[9] Evidence suggests that private materialism and consumption have risen in many high-income societies, especially the USA.[14] Other analyses show how most countries globally have seen increases in individualistic values and practices since the 1960s (an increase of about 12% worldwide),[16] with detailed studies in several countries (eg, Türkiye, China, and the USA).[4,17,18] These trends undermine prosocial identity and corresponding self-transcendence values[19,20] and are expected to exert damaging effects on the environment (figure 1), which are mediated by at least four hypothetical pathways: consumer choices, adaptation to environmental risks, economic regulation, and cooperation in international policy.

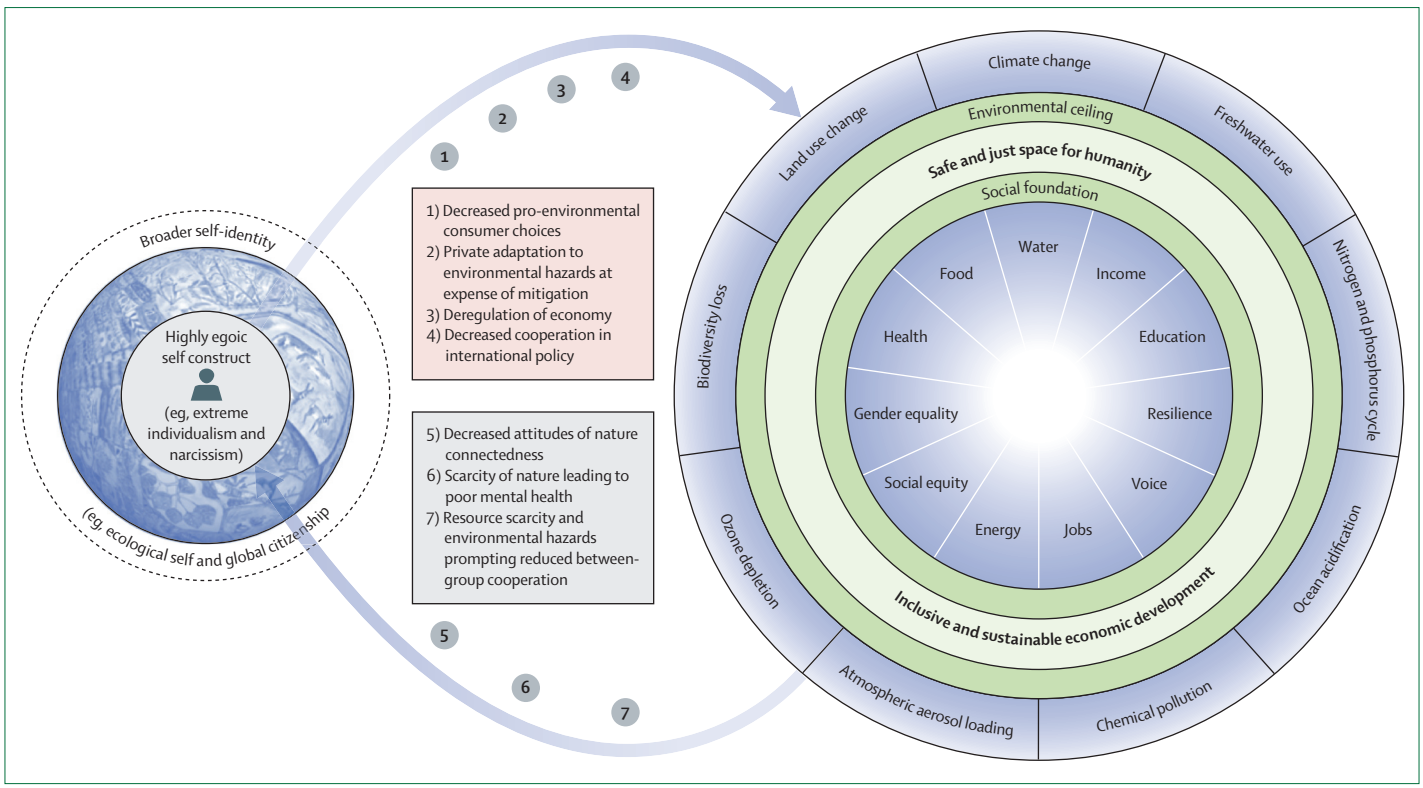

Figure 1: **Systemic feedback loops between self-identity, planetary boundaries, and social foundations**
The safe and just operating space is derived from the conceptual models by Rockstrom and colleagues[21] and Raworth,[22] extended here to include feedbacks with factors that determine self-identity. Shown are various mechanisms that promote vicious cycles involving degradation of environmental quality and social injustice, but there is opportunity to reverse these into virtuous cycles. Part of the figure is reproduced from Raworth,[22] by permission of Oxfam.

Substantial data point to the harmful effects of excessive individualism, characterised by materialistic, self-enhancing values and extrinsic consumptive goal pursuit, on care and engagement in environmental causes.[19,23,24] Related to these values, a more independent self-identity has been associated with fewer pro-environmental behaviours; for example, being less likely to recycle domestic waste, reduce a carbon footprint, or to purchase guided by sustainability concerns.[25–27] These decisions and behaviours are crucial for planetary health because individual consumption, and associated domestic carbon emissions and energy use, are among the root causes of environmental degradation,[28] leading to transgression of perceived safe limits for planetary health.[21,29]

In addition to influencing consumer choices, individualistic trends in society might be responsible for a growing pattern of private adaptation to environmental threats, whereby new technologies and access to resources increasingly support individuals reducing risk for themselves, their families, and businesses. These trends can influence how people act to reduce personal exposure to environmental risks, such as extreme weather events. For example, when dealing with the effects of climate change, wealthy individuals are able to cool their own houses, protect themselves against flooding, and preferentially secure water resources during drought events.[30,31] Such actions might come at the expense of mitigating environmental damage and, if they hamper resilience for others, also raise questions around environmental justice.[32]

Changes to self-identity and values towards the environment can also cascade up to influence the social and economic institutions that have strong influence over maintaining a safe planetary operating space.[33–35] Institutions, culture, and mindsets are closely linked in feedback processes (figure 2).[7,37] For example, social norms can become internalised to become moral codes of action, and expectations of cooperation and mutuality can become embedded into institutional frameworks.[38,39] One influence that could potentially cascade upwards is an increased focus on the pursuit of individual wealth, which can lead to deregulation of economies[40] in a manner that is harmful to the environment (eg, reversing environmental protections), although evidence can be conflicting.[41,42] Other researchers warn, however, that collectivist identities can stifle innovation, which is also important for environmental solutions.[43]

In tandem with an individualistic identity, most people relate to groups at a range of hierarchical scales (eg, their family, sports team, nation, ethnic group, or the whole world),[8] reflecting what has been called their social identity.[44] A sense of global identity and citizenship has

been associated with a preference for purchasing environmentally friendly products[45] and environmental activism.[46] In politics, a sense of national versus global identity is highly relevant for international cooperation, particularly given the transboundary nature of many environmental problems (eg, air pollution, climate change, and ocean acidification). Strongly nationalistic sentiment can be harmful to the environment if it comes at the cost of international cooperation.[47,48] For example, former US President Donald Trump's America First policy led to a temporary removal of the USA from 2015 Paris Climate Agreement and attempts to terminate the country's funding of WHO.

An outstanding question is the strength of these associations between self-identity and environmental change and their direct causality. Investing in an improved understanding of these issues can allow researchers to harness the potential for using transformation of identity and values as leverage points for change.[37,49,50] For example, high levels of individualism have been associated with environmental destruction at the national scale,[51] although the interacting roles of other factors need untangling.

Environmental degradation driving changes to self-identity

Damage to the environment can prompt feedback effects influencing individual psychology and the capacity for individuals and institutions to prevent further environmental decline (figure 1). There are many interacting mechanisms, including decreased exposure to nature influencing formation of the self-identity, reduced capacity for pro-environmental behaviour because of poor mental health, and reduced between-group cooperation, which are each discussed here.

Evidence shows that formative experiences of nature are important for an interdependent self-identity, which includes other people and nature, sometimes called the ecological self,[52,53] or metapersonal,[54] and linked to self-transcendence (ie, identifying beyond a highly indi—viduated ego).[55,56] These formative experiences include time spent in nature and engaging in activities in which a person can have a mindful sense of nature connectedness (eg, watching, hearing, photographing, or painting plants and wildlife).[57–59] However, the loss of accessible biodiverse greenspace in many countries has led to reduced interaction with nature,[60] creating a shortfall of nature connectedness[25,26,57] and undermining the interdependent self-identity of adults.[61] The ultimate cost is to pro-environmental attitudes, understood as people's concern for, and intentions to protect, the environment.[25,26,57,61]

The quality of the natural environment has also been shown to be strongly associated with mental health, mediated both through physical activity in the outdoor environment and through increased nature connectedness[62,63] and psychological restoration.[64] Furthermore, individuals living in communities that have regular access to nature feel a sense of social connection that supports their mental health.[65] Beyond direct access to greenspace, the quality of that space in terms of perceived species richness has been shown to be important.[66] In response to biodiversity loss, increased urbanisation,[67] and decreased exposure to nature,[60] mental health is expected to decline. This decline could potentially have effects on the capacity to prevent further environmental degradation,[68] because psychosocial factors that are closely related to health and wellbeing might be prerequisites for desirable pro-environmental behaviours.[69,70] These health impacts are likely to occur despite a shifting baseline effect, whereby environmental degradation is not recognised due to scarce recollection of historical conditions.[60] Some of the pro-environmental behaviours that are affected, such as conservation volunteering, involve direct interaction with nature, thus their absence exacerbates a vicious cycle.[60]

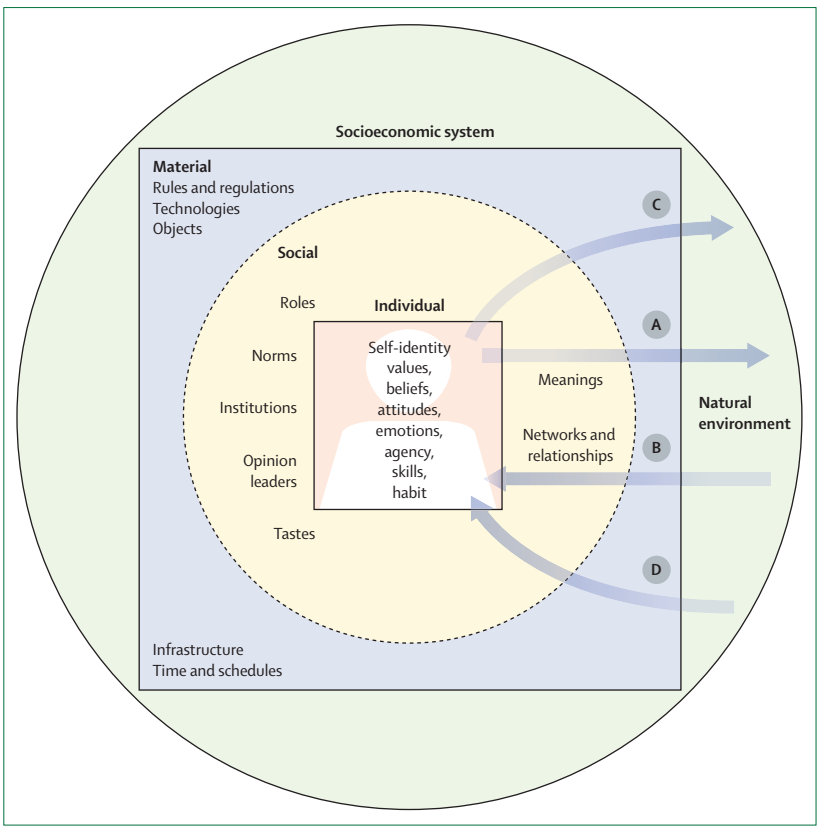

Figure 2: **An adapted individual, social, and material model**
The individual, social, and material model was developed by Darnton and Horne[36] and is adapted here to show direct links between individual factors, such as self-identity on environmental quality, where arrow A shows how a self-identity incorporating nature leads to pro-environmental behaviours and arrow B shows how more exposure to nature leads to a greater sense of nature connectedness. Individual factors also cascade up to influence social and material factors leading to changes in environmental quality (arrow C; eg, shows how a culture of individualism can promote profit-seeking in companies at the expense of environmental protection) and, in the other direction, changes to environmental quality can lead to material and social changes that influence individual factors (arrow D; eg, climate change induced human migration leading to a culture of xenophobia influencing self-identity). Notably, the factor self-identity has been placed in the individual realm here contrary to Darnton and Horne's original placement as a social factor. In practice, factor self-identity arises from an interaction between individual factors and social context, as do many of the individual factors.[7]

Another outcome of environmental degradation is reduced cooperation between groups, which is important for protecting public commons.[39] Environmental threats and how they are portrayed in the media can lead to increased fear, denial of problems, or absence of motivation to work with others to deal with the issues.[71] Mortality salience driven by environment-mediated threats has even been suggested to increase indulgence purchasing, materialistic values, and overall consumption rates.[72] However, some research shows that existential threats, such as deadly hurricanes, might prompt pro-environmental behaviour if pro-environmental norms are made salient.[73] The issue of how environmental decline will affect pro-environmental norms is clearly complex, with little consensus and effects that are likely to differ between different people.[74] However, clearly there is strong potential for negative feedback processes that further hasten environmental decline.

At the level of in-group identity, a growing body of evidence links environmental threats and consequent social impacts, such as extreme weather events and human displacement, to increased in-group cohesion (ie, tighter societies) and increased antagonism with out-groups.[75,76] This increased in-group cohesion might lead to an improved ability to deal with some localised threats, although not necessarily transboundary threats, such as climate change,[77] but might also lead to xenophobia and nationalism.[78] The potential for environmental perturbations to cause human displacement across national boundaries prompting xenophobic responses raises particularly concerning ethical dilemmas.[79]

Many researchers suggest that national identity leads to reduced international cooperation, which is essential to deal with transnational environmental problems,[47,48] although others suggest it can sometimes mobilise environmental norms and pro-environmental tendencies.[80] Finally, economic and ontological insecurity driven by environmental degradation might also lead to political shifts, for example, the election of right-wing populist leaders, who are often favoured by electorates following environmental and social crises.[81] Right-wing leaders tend to have low tolerance of ambiguity and little capacity for systems thinking, both of which are cognitive traits that are necessary for solving complex systemic environmental problems.[82–84]

The potential for virtuous cycles

Feedback cycles can work both ways, and the mechanisms linking individual self-identity and corresponding values and attitudes with environmental quality might also lead to a virtuous cycle. The causal links between self-identity and the quality of the environment described in the previous sections are reversible, and so we do not repeat them all here. Instead, we discuss an example related to pro-environmental behaviours. Enhancing environmental quality, especially in urban areas,[85] is expected to improve nature connectedness contingent on active engagement with nature,[86] thereby increasing the tendency for pro-environmental and prosocial attitudes and behaviours.[25,27,45,57] Notably, widespread gaps can exist between self-transcendence values that focus effort and commitment towards caring for the environment, among other prosocial ends, and the execution of those values.[87] However, empirical data suggest behavioural shifts; for example, longitudinal studies show that community gardening schemes for prisoners reduce the probability of prisoners reoffending and can lead to a range of prosocial and pro-environmental attitudes.[88] In another study, the greening of vacant lots was shown in randomised controlled trials to reduce violent crimes and help communities to feel safer.[89] Hence, it appears possible to put a virtuous cycle into place, with restoration of the natural environment stimulating development of healthier, pro-social self-identities commensurate with societal transformations towards environmental sustainability.

A safe and just operating space for human identity?

A safe and just operating space for socioecological systems has become a powerful bridging concept in sustainability science (figure 1).[21,22,29] The concept integrates biophysical earth-system tipping points (ie, thresholds at which small changes can lead to amplifying effects) from a natural science perspective with social science considerations of distributional equity and justice. Arguably, this integration delineates the social and environmental boundaries of sustainability and, with an additional consideration of economic viability, embraces the three pillars of sustainability (ie, society, the economy, and the environment).[90] The concept of a safe and just operating space for humanity has been valuable in raising attention to the topic of environmental risk (at the planetary scale) in balance with social justice and in motivating research to target and refine metrics at different spatial scales.[91,92]

The concept of a safe and just operating space for humanity, however, neglects the multiple feedback loops between individual psychology (particularly in terms of self-identity) and both social foundations and environmental planetary boundaries. This Review outlines how multiple feedback loops create complex but strong dependencies between the self-identity of citizens and the capacity for society to stay within equitable social and planetary boundaries. Along the lines of a safe and just operating space for planetary boundaries there might be an analogous safe and just operating space for individual self-identity.[93] We hope that introducing this concept can raise the profile of interventions at the level of individual human psychology and help to motivate dialogue around, and the innovation of metrics for, inner transformation (ie, transformation of self-identity) for environmental sustainability.[94]

Exceeding the thresholds at one end of this safe and just operating space for human self-identity is excessive individualistic behaviour, which drives accelerating transgression of both planetary and social boundaries. For example, although a sufficiently strong sense of egoic identity and self-esteem has been widely considered to be a healthy attribute providing psychological resilience,[95] an excessively strong sense of self-care at the expense of others occurs in people with narcissistic traits. Narcissism is characterised by a sense of self-identity that is strongly distinct from others together with selfishness, a sense of entitlement, and absence of empathy, and is also associated with few pro-environmental behaviours.[24] The tendency to form implausible or distorted beliefs about the nature of our self-existence and consequential mental illness, causing harm to others and to the environment, has been termed ontological addiction[96] or individuation pathology.[97]

At the other end of the spectrum, there might be a minimum level of individual self-care for maintaining personal health and prosperity. Although collectivist mindsets might be particularly important in managing environmental commons,[13,38,39] humans evolved a distinct sense of individual selfhood because of its adaptive benefits, such as memory collation and tracking social interactions. So, even if the apparent independence and autonomy of the self is illusory, it is still essential for human survival.[97] There might also be other social benefits of individuality, such as increased rates of innovation,[43] which are important considerations in setting ambitions for any kind of stewardship of self-identity across society.

Hence, the safe and just operating space for self-identity delineates an ideal parameter space for the degree of individual versus collective identity, and evidence suggests that exceeding these bounds at either end can lead to environmental degradation and low levels of health and wellbeing.[13,24,38,39,95–97] Furthermore, feedback interactions between individual mindsets and environmental quality mean that transgressing the boundaries of this safe and just operating space can lead to society becoming locked into a vicious feedback cycle (figure 1).

A note of caution on the limits of analogies is worthwhile. The safe and just operating space of planetary boundaries[22] has been a powerful communication tool but has its limitations. For example, just because actions are taken to move away from environmental tipping points (ie, away from the environmental ceiling beyond which emissions or material resource use become unsustainable), does not mean that society is necessarily getting closer to contravening existing social foundations, such as access to food, water, and energy (figure 1). In fact, many actions that benefit the environment, such as improving circularity in the economy to reduce waste and pollution (as reflected in the political green deal aspirations[98]), can also be a win–win for social equity, jobs, health, and other desirable societal outcomes. In a similar way, the idea of a safe and just operating space for self-identity also has some limitations that are worth reflecting on. Although it might be useful to think of self-identity as a linear continuum (or as a pendulum that can swing too far one way), this concept is perhaps overly simplistic. Self-identity is more likely to be nested hierarchically, because when a person identifies at the metapersonal level with other people and nature, they do not lose the sense of egoic identity, but rather they add to it.[54] Hence, individuals can switch back and forth between perspectives. By contrast, people who score highly on individualism tend to have only the egoic perspective and do not have a metapersonal perspective.[54] From a psychological development perspective, achieving a safe and just operating space for human identity is important for growing towards a wise balancing of our individual needs with the collective common good.

Wise stewardship of socioecological systems

Monitoring and understanding change

The implication of the systemic feedback effects between self-identity, values, and attitudes and environmental quality that are outlined in this Review is that there might be rapid and unexpected changes in socioecological systems that we fail to predict or understand. Widespread degradation in environmental quality through habitat and biodiversity loss, climate change, and pollution are important contributing influences to change in self-identity; which, in turn, has the potential to exacerbate or slow down further environmental degradation. Understanding the role of these interlinked factors in creating feedback dynamics is an area that requires interdisciplinary planetary health research.

Historic changes in human self-identity are not well captured throughout pre-literary history, but given the strong systemic feedback cycles that are identified here, it is relevant to explore whether these changes had a role in the decline of earlier human civilisations. Some research suggests that an inability of elites to perceive and respond to environmental decline, such as natural resource depletion and pollution, was a key factor in previous civilisational collapses.[99] It is easy to imagine how severe resource scarcity might cause social fractures and reduce cooperation, which is needed to solve collective problems, thus further exacerbating the decline of common pool resources.[38,39] Globalisation of the resource economy and the offshoring of pollution have arguably delayed such reckonings for modern affluent societies, yet evidence suggests that cumulative impacts now exceed safe thresholds for sustainability at a global level.[21,29] Therefore, society needs to be increasingly mindful of the risk of swift escalation of environmental and social problems, particularly the potential for exacerbation by a rapid withdrawal of international cooperative efforts in response to increasing social stress. These potentially rapid feedback processes reinforce the need to monitor and understand changes in worldviews and their capacity to transform institutions rapidly with consequences for

planetary health. Appropriate efforts for monitoring values and attitudes in society are expanding. For example, the World Values Survey conducts annual surveys, and the Intergovernmental Platform for Biodiversity and Ecosystems Services is completing a values assessment.[100] These international initiatives are also informed by national schemes (eg, Natural England's People and Nature Survey in the UK).

There are also increasing efforts to understand how identity and values influence socioecological system dynamics. For example, the European Commission Joint Research Centre has completed an expert assessment on the science of values and identity as part of their Enlightenment 2.0 research initiative.[101] The Intergovernmental Platform for Biodiversity and Ecosystems Services is completing a transformative change assessment, which has a strong focus on not only structural changes (ie, economic, institutional, technical, and technological dimensions) but also inner transformations (ie, behavioural, social, and cultural factors) to achieve global sustainability targets. A key implication of our Review is the crucial importance of considering the role of these inner transformations in creating feedback cycles with rapid environmental change and how the effects can sometimes be detrimental for society and planetary health (ie, leading to a vicious cycle).

Reorienting self-identity for prosocial and pro-environmental outcomes

There have been marked advances in understanding the science behind global environmental degradation, along with a growing policy response by governments. However, there is now an increased recognition of the need for a substantial change in how our institutions function and in individual behaviours, which might require deep cultural shifts in worldview and self-identity.[12,13,97,102] Given the strong feedback cycles between individual self-identity and environmental quality, which are outlined in this Review, there is a clear need to consider implications for the governance of environmental sustainability. Government and civil society might wish to explore a proactive role in reorienting self-identity and values to enable prosocial and pro-environmental outcomes and improved safeguarding of planetary health. However, many liberal governments appear to take a non-interfering approach to influencing the self-identity of citizens. Behavioural interventions are often limited to small nudges, which change choice architectures without addressing fundamental values.[103,104] Perhaps this approach is unsurprising given the tragic history of interventions in some past communist and fascist regimes, which tried to transform the characters of citizens (ie, there is justifiably a strong rejection of attempts to change citizens' beliefs by coercive or forcible means). Nonetheless, a *laissez-faire* attitude towards the development of self-identity does not mean no influence: individuals' mindsets are continually shaped by media, business, education, and government (even if unintentionally). Over the past half century, evidence has shown self-identity shifting towards individualistic values and attitudes in most countries, driven by the combination of these influences.[16,18] So, the role of the state and civil society initiatives in guiding identity and values for planetary health is a suitable area for ethical governance research.[105] As climate researcher Benjamin Sovacool has stated "We are entering territory that is very much taboo. The things that we may have to force or nudge people to do are entwined with identity. They are stickier, harder to change."[106]

Notably, stewardship of self-identity and values does not have to be a top-down imposition (which might well fail) but can rather involve government facilitation of high-quality public debate supplied with appropriate evidence. For example, in response to climate change and mass human migration,[79] we might expect instinctive responses of society to include increased antagonism to out-groups.[75,78] Yet, armed with knowledge of this response, government and other civil society groups could proactively facilitate informed debate about a long-term strategy that is ethically grounded. Effectively managed, inclusive processes of dialogue and deliberation have been shown to create shared values and assist in systemic transformation towards increased environmental justice.[107,108] Achieving environmental justice requires increased attention to actors with vested interests that attempt to manipulate self-identity, values, and attitudes on environmental issues (eg, fossil fuel corporations and their investors). Governments might also wish to facilitate dialogues, both within and between countries, that develop an ambitious shared vision for moral progress, which helps to build the social

See Online for appendix

Search strategy and selection criteria

Our aim was to identify multiple potential causal links between self-identity and global environmental quality that have been shown in primary literature. Rather than sourcing evidence for a single known causal relationship, our aim was to investigate how various individual pathways can link together in feedback loops, which requires a less reductionist approach. As such, systematic literature review and meta-analysis were not feasible.
Our investigation comprised two phases. First, on the overall topic of systemic feedback processes between self-identity and environmental quality, we pooled insights from our interdisciplinary team, sharing ideas and articles that we deemed relevant to the topic. We generated initial hypotheses outlining distinct types of feedback processes, particularly the extent to which social foundations and environmental planetary boundaries might be transgressed because of these processes. Second, from this broad evidence base, we identified specific feedback loops and conducted further targeted evidence-gathering on each. We searched Web of Science, Scopus, and Google Scholar for papers published in English between Jan 1, 1950, and July 1, 2021. We searched using unbiased terms (appendix pp 1–2) as in a systematic literature survey, but our analysis is not exhaustive, rather it provides hypotheses to stimulate further discourse and analysis. We have emphasised where there are contrary views around a causal link, allowing further detailed work to assess the amount and consensus of evidence in a detailed way. Such absence of consensus can be viewed as parameter uncertainty in our conceptual model of these multiple feedback loops (figure 1), but we also note that structural uncertainty exists, where there might be additional links that we have not reported here.

norms around cooperation and can rein in excessive individualism. For example, the European Commission's seventh Environment Action Programme contained the vision to "live well, within the planet's ecological limits".[109] This idea contains a recognition of planetary boundaries, yet there is arguably need for increased facilitated public dialogue on the key elements of living well, particularly the extent to which aspects of self-identity, values, and attitudes are involved. Initiatives helping to share best-practice approaches to inner human development are also highly relevant here; for example, mindfulness training to help to address the climate crisis[110] and reconnecting with nature to aid transformation of food systems towards sustainability.[111]

Conclusion

The existence of strong systemic feedback suggests that efforts to create institutional reform to improve planetary health might be ineffective if they do not also embrace change to individual self-identity and values. These factors are known to be deep leverage points that can hinder sustainability transitions.[49,112] However, worse than simply being problematic barriers to desirable transformation, the existence of feedback processes between self-identity and environmental quality can lead to a vicious cycle. Environmental degradation causes loss of nature connectedness, worsens mental health, and reduces the motivation and capacity for pro-environmental behaviour. Furthermore, environmental shocks create social tension with out-groups, reducing the capacity for cooperative approaches to managing public environmental commons. On an optimistic note, the existence of systemic feedback processes in social and environmental systems provides multiple points to intervene to create a virtuous cycle through the restoration of nature and coincident changes in self-identity towards interdependence and mutuality. These changes to worldview are also a probable prerequisite to stimulate institutional change that can safeguard planetary health.

Stewardship of self-identity focusing on justice (ie, with regards to ethical issues around reorienting self-identity for prosocial and pro-environmental outcomes) emphasises a need for disciplines such as environmental psychology to be integrated into sustainability policy, with a major role for ethicists in assessing intervention strategies. Facilitation of public dialogue is urgently needed to develop consensus on democratic approaches that recognise the plurality of visions for the evolution of self-identity along with acceptable strategies for stewarding planetary health (ie, balancing individual autonomy and liberty with collective good, including future generations and other species). A key challenge is reducing pernicious hidden influences that have been influencing self-identity and attitudes with negative consequences for planetary health. Overall, this Review emphasises the need to avoid neglecting the important role of self-identity and values in systemic feedback processes within socioecological systems and instead recognise their major implications for planetary health.

Contributors

THO led conceptualisation of the Review with inputs from AD, NG, MPG, LJH, ACL, SJM, VJP, PT, and NW. All authors contributed to literature collation and manuscript writing, led by THO.

Declaration of interests

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