Putting relational thinking to work in sustainability science – reply to Raymond et al.

Simon West a,b,c, L. Jamila Haider d, Sanna Stålhammar e and Stephen Woroniecki f

aStockholm Resilience Centre, Stockholm University, Stockholm, Sweden; bFenner School of Environment and Society, Australian National University, Canberra, Australia; cNorthern Institute, Charles Darwin University, Darwin, Australia; dLund University Centre for Sustainability Studies, Lund University, Lund, Sweden; eDepartment of Thematic Studies, Environmental Change Unit, Linköping University, Linköping, Sweden

ABSTRACT
We welcome Raymond et al.’s invitation to further discuss the ‘pragmatics’ of relational thinking in sustainability science. We clarify that relational approaches provide distinct theoretical and methodological resources that may be adopted on their own, or used to enrich other approaches, including systems research. We situate Raymond et al.’s characterization of relational thinking in a broader landscape of differing approaches to mobilizing ‘relationality’ in sustainability science. A key contribution of relational thinking in the process-relational, pragmatist and post-structural traditions is the focus on the generation and use of concepts. This focus is proving methodologically useful for sustainability scientists. We caution against viewing the generation of concepts purely in terms of ‘applying the knife’ to ‘divide components.’ Relational thinking offers alternatives more congruent with complexity: away from an ‘external’ actor cutting away at the world with an ‘either/or’ logic, towards an ‘immersed’ actor contributing generatively within it using a ‘both/and not only’ logic. The pragmatics of relational thinking will vary according to purposes. We describe two possible pathways for using relational thinking in research practice – (i) working forwards from relations, and (ii) working backwards from existing concepts – and discuss how relational thinking can contribute to complexity-oriented visions of ‘solutions-oriented sustainability science.’

1. Multiple approaches to relationality

We thank Raymond et al. (2021) for their attentive engagement with our paper (West et al. 2020), and welcome critical discussions around relational thinking in sustainability science. We begin by clarifying that our ‘target audience’ for the value of relational thinking is all those who are interested in the study of complex sustainability issues, not only those who adopt ‘dynamical systems’ approaches (Raymond et al. 2021, p. 2). Relational approaches add to the theoretical and methodological resources available to sustainability scientists: they may be used entirely ‘on their own,’ without connection to systems approaches, or they may be used to enrich systems and other approaches in various ways.

In our identification of four themes in relational thinking – continually unfolding processes, embodied experience, reconstructing language and concepts, and ethics/practices of care – we prioritised research associated with the ‘relational turn’ in the humanities and social sciences. This includes process-relational (Whitehead 1978), pragmatist (Dewey 1958) and post-structural philosophy (Deleuze and Guattari 1988), and their expressions in contemporary social, cultural and political theory. We did so because these forms of relational thinking most explicitly identify and articulate alternatives to modernist-substantalist commitments, including dualisms of nature/society and mind/body.

We highlighted sustainability research that connects with relational thinking in various ways; from work fully adopting process-relational philosophy, to work that draws inspiration from relational approaches while retaining some modernist-substantalist commitments. Raymond et al. appear to argue from this latter type of perspective, where they characterize relational thinking in terms of the work of Robert Pirig, ecological psychology and the behavioural sciences (p. 1), and maintain substantalist distinctions between subject/object and cognition/experience (p. 2–3). Raymond et al.’s reply therefore provides a good illustration of the different ways of mobilizing ‘relationality’ in sustainability science, while also highlighting the challenges of communication between research groups with common terms but differing reference points. In what follows, we briefly clarify some differences between Raymond et al.’s treatment of ‘relations,’
‘entities’ and ‘concepts’ and our own, before exploring the implications for research methods and solutions-oriented sustainability science.

2. Relations, entities and concepts in relational thinking

Modernist-substantialist philosophies begin from the ontological assumption that the world is composed of relatively stable entities (Mesle 2008). These philosophies are closely entangled with positivist epistemologies, where concepts are understood as abstract mental constructions separate from ‘the world itself’ (Schaffer 2016). The researcher is imagined to stand ‘outside’ of the world, with the aim of formulating concepts that accurately represent a (single) external reality. These are so-called mirror or correspondence theories of truth, where the knowing subject and the known object are separate. A crucial aspect of formulating concepts, in positivist approaches, is specifying the properties or attributes of the entity that the concept is intended to represent, to remove ambiguity and facilitate observation, measurement and comparison. Categorization tends to proceed with an ‘either/or’ logic: entities are either one thing or another (mind/body, social/ecological, subject/object). It is believed that these practices will deliver authoritative knowledge to decision-makers to solve social and ecological problems (Ansell and Geyer 2017).

The major contribution of coupled systems approaches has been to suggest that all entities are inextricably linked together, and to represent the world more accurately we need to link our concepts together too. Researchers have generated additional concepts to describe the ‘interactions’ between entities (Ostrom 2009). More recently, some forms of cultural ecosystem services and relational values scholarship have suggested that these entities would not exist at all if not for their relationships. Such work exemplifies a broader turn to ‘relationality’ in sustainability science (Chan et al. 2018). Raymond et al. (2021, p. 2) suggest that much of this research, inspired by fields like ecological psychology and ecological economics (as well as various relational philosophies), tends to define relations as the ‘relations between things and processes.’ The goal is to ‘systematically assess’ relationships between ‘system components’ (Raymond et al. 2021, p. 1), and to inform policy-making through, e.g. identification and valuation of ecosystem services. These approaches often frame knowledge as inevitably ‘partial,’ with many different perspectives necessary to obtain a better picture of reality. These are all important contributions and are generating valuable knowledge and policy efforts in pursuit of sustainability.

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Yet many sustainability scientists, including those who work with systems approaches, feel there is more to explore here. The root concepts themselves (e.g. ‘social’ and ‘ecological’) are problematic in societies that are organized around different sets of concepts (Caillon et al. 2017) and linking dualistic concepts through interactions does not necessarily capture our experience of them as ‘inextricable’ (Schlüter et al. 2020). Raymond et al. (p. 1–3) suggest that these tensions are an inherent feature of analytic thought – researchers ‘inevitably’ have to ‘apply the knife’ and ‘make the cut’ to ‘divide components’ – and suggest ‘[cutting] out system boundaries in different ways.’ However, while we agree that experimenting with system boundaries is useful, it appears to us that the metaphor of the knife continues to rest on modernist-substantialist commitments (Whatmore 2002). It positions the researcher ‘outside’ of the phenomenon of interest, cutting away at it, with the aim of ‘systematically assessing’ or representing a world external to them (Raymond et al. 2021, p. 1). Because the researcher is supposedly compelled to represent from the outside, yet will never achieve a ‘full’ representation, knowledge production is portrayed as an inherently reductive, even violent act (‘something is always killed in the process,’ Pirsig qtd. in Raymond et al., p. 1). We acknowledge that researchers certainly can and do conceive of their work in this way, often with good reason. In fields like engineering and medicine these commitments have resulted in huge practical success. Yet this vision of research practice is far from inevitable. Indeed, there are many good reasons to question the suitability of such commitments when addressing complex sustainability problems: not least because many analysts, including systems thinkers, have identified their dominance as contributing to sustainability challenges in the first place (Ison 2018). Relational thinking in its philosophic and social theoretic senses can provide alternative ways of thinking about concepts and the ‘ways of knowing, being and doing’ that underpin them (Martin and Mirraboopa 2003).

Relational philosophies begin from the ontological assumption that the world is composed of continually unfolding relations, which occasionally ‘converge’ in periods of time and space (Mesle 2008). These convergences are what we experience as the familiar regularities and objects of everyday life (including what substantialist philosophies would call ‘entities’). To organize and do things together, we find it useful to name some of these relations and convergences of relations with ‘concepts.’ Concepts are powerful; they designate what we ontologically experience in the world (‘rock,’ ‘animal,’ ‘tree’), and shape our actions and institutions. Different cultures experience, conceptualize and act in the world differently (Verran 2017). In relational philosophies, then, convergences...
of relations, identified with concepts, essentially replace the substantialist concept of ‘entities.’ This should not be confused with constructivism: on the one hand, relations are very real, and on the other, concepts are not understood as purely ‘mental’ or cognitive phenomena disconnected from the world, but embodied, performative phenomena that actively help to make it (Campbell 2020). The researcher is not positioned outside the world, observing from a distance with the intent to purely assess or represent, but as fundamentally ‘immersed’ or ‘engaged’ in the world with the recognition they are also ‘enacting’ or ‘performing’ it (Braidotti 2013). As Barad (2007, p. 185) notes, ‘we know because we are of the world.’

These relational commitments produce different metaphors for conceiving of research practice. The aim of total representation is replaced with that of producing ‘situated knowledges’ for particular contexts/purposes (Haraway 1988). This enables concept-making to be perceived as a generative rather than reductive act: concepts are tools that enable us to do things potentially differently. Relational philosophies broaden the possible logics guiding concept-creation: we can choose to do ‘either/or,’ but we can also do ‘both and not only’ (De La Cadena and Lien 2015). If the world is complex, shifting and ambiguous, then – as the literature on boundary objects shows (e.g. Enqvist et al. 2018) – concepts may be productively ambiguous too (Law 2004). As Raymond et al. (2021, p. 2) indicate, concepts favoured in relational philosophies, including ‘care’ and ‘experience,’ still require varying degrees of differentiation from others, but they are not generated through the dualistic logic of ‘making the cut.’ These academic concepts are not generally measured and modelled, but rather used to sensitize researchers to the ways in which concepts are generated, stabilized and used in practice. Contrary to Raymond et al.’s (p. 2) claim that relational philosophies encourage ‘a shift away from concepts and categories of meaning,’ we have found that they help us to better understand concepts and their uses.

3. The pragmatics of relational thinking

Relational thinking in the process-relational, pragmatist and post-structuralist traditions provides methodological guidance that can be useful to any researcher interested in sustainability issues, regardless of whether they end up framing their work as explicitly relational (Law 2004). We certainly do not see relational thinking as ‘replacing’ any existing methodological frameworks in sustainability science (Raymond et al. 2021, p. 3). Rather, we see relational thinking as potentially prompting a ‘paradigm opening’ (West et al. 2020, p. 318), thus contributing to the pluralistic and pragmatic sustainability science envisioned by Raymond et al.

The use of relationality in sustainability science is already taking many different forms, reflecting the diversity of relational theories and methods, and the various backgrounds, practices and purposes of those drawing on them. The ‘pragmatics’ of using relational thinking in research will vary accordingly. We can understand how, when viewed from the perspective of certain commitments and analytical strategies, relational approaches may not appear ‘fleshed out enough’ to provide alternative methodological options (Raymond et al. 2021, p. 3). Yet viewed from the perspective of process-relational, pragmatist and post-structural philosophies, and their expressions in sociology, science and technology studies (STS), Indigenous studies, and many others, the challenge is rather that they are so fleshed out it is difficult to navigate the methodological options available! See recent guidance on, e.g. relational interviewing (Fujii 2017), action research (Bartels and Wittmayer 2018) and ethnography (Desmond 2014). So for us, the methodological challenges of mobilizing relational thinking in sustainability science involve better communicating the options provided by these latter approaches, and exploring their significance in computational and statistical methods. With this in mind, we identify two research pathways for using relational thinking in sustainability science, that may be useful across different approaches: (i) working forwards from relations, and (ii) working backwards from existing concepts (Figure 1).

Working forwards from relations

This pathway begins from a stance of ‘openness’ to the empirical phenomenon of interest, and encourages the researcher to carefully follow, trace and experience empirical relations before slowly building and negotiating concepts. This approach prompts us to slow down and not ‘fall back on’ taken-for-granted conceptual schemes before we experience the empirical phenomenon. Of course, the idea that researchers are a ‘blank slate’ has been comprehensively critiqued. The principle of openness is intended to encourage an attitude of receptiveness to complexity - captured by approaches like ‘relational empiricism’ (Kenney 2015) and ‘radical empiricism’ (Mancilla Garcia et al. 2020a).

Negotiating concepts might mean, in descriptive research involving a single researcher, tacking back-and-forth between the empirical phenomenon, including the concepts-in-use within that phenomenon, and existing academic concepts. In action-oriented, co-productive research, negotiating concepts might also involve explicit deliberation between participants (Norström et al. 2020). Negotiation will
be informed by ethical, practical, and political considerations, among others, and geared towards producing provisionally usable concepts capable of engaging the complexities of the problem at hand, relative to the purposes of inquiry. Through careful negotiation, it might be decided that ‘new’ concepts need to be built, specific to the relations constituting the phenomenon in question. Or it might be decided that existing concepts are helpful (see Boxes 1–4 in West et al. 2020). In ‘purely’ relational approaches, these concepts would be developed with particular attention to their abilities to effectively mobilize relations, and in the latter case would likely emerge at least partly from existing relational theories. Yet working forwards from relations may also be useful in contexts where it is eventually considered appropriate to adopt more traditional, dualistic concepts. In such cases, working forwards from relations and explicitly negotiating concepts, rather than assuming them from the beginning, may ensure that concepts are better situated in context, open to revision, and usable for the task at hand.

**Working backwards from existing concepts**

Often it is not possible for researchers to assume a stance of ‘openness’ to tracing relations – because of their own initial assumptions, the demands of supervisors and research institutions, or the expectations of societal partners. Much academic work is also theoretical, where researchers begin with concepts rather than the relations that constitute them. In these cases, a research pathway of ‘working backwards from concepts’ may be useful. This begins with identifying the inherited concepts, and then working backwards to follow the relations, practices and assumptions that produced them. Research participants can then re-negotiate the concepts in light of their own context/purpose. Working backwards from concepts can be especially fruitful in intercultural situations where languages and concepts are different, as a means of generating shared understandings and concepts that ‘work’ to ethically and effectively guide collaborative activities (Spencer et al. 2020).

Importantly, the work of re-tracing relations and re-negotiating concepts cannot be done in the language of only one of the parties (Stengers 2011).

Working backwards from concepts can also be useful in the intercultural contexts of sustainability science, where researchers using different concepts often attempt to communicate and work together. For example, the questions posed by Raymond et al. begin with concepts; they ask how concepts generated within relational thinking (e.g. ‘continually unfolding’) might connect to those within systems thinking (e.g. ‘leverage points’). Working backwards from concepts would require research participants to view both sets of concepts as provisionally useful in certain contexts and, in principle at least, equally open to revision. Research participants would then trace the relations, assumptions and practices that have generated each set of concepts, before negotiating where connections might be made. For example, through such negotiations it might become apparent that concepts of ‘levering change’ embody assumptions that are different to those contained in ‘continually unfolding processes,’ in which case participants might revise their understandings of either of these concepts or generate new provisionally useful concepts to tackle the challenge at hand. Mancilla García et al. (2020a, 2020b), Hertz et al. (2020) and Schlüter et al. (2020) describe this kind of approach to working with relational and socio-ecological systems concepts.

**4. Relational thinking and solutions-oriented sustainability science**

We appreciate the focus of Raymond et al. on the practical benefits provided by relational thinking. Just as there are many ways of conceptualizing ‘relationality,’ there are also many ways of thinking about how researchers might productively address sustainability...
challenges (Caniglia et al. 2021). Raymond et al. frame solutions-oriented sustainability science in terms of judging the ‘efficiency’ of solutions identified by differing academic paradigms, in ‘decision contexts that have specific, well-defined properties’ (p. 3). Researchers are imagined to play central roles in identifying, managing and assessing solutions that ‘align with the desired future but also meet research, planning and fiscal timelines,’ and help to ‘realise transformations toward sustainability in a narrow window of 10–15 years’ (p. 3). We agree that such an approach might be useful in relation to a subset of tightly structured situations (Stirling 2010). But many complex sustainability challenges are, by definition, neither specific nor well-defined (Ludwig 2001).

Relational thinking has helped us to develop broader, complexity-orientated understandings of how sustainability scientists might contribute to positive change (Clark et al. 2016). In recognizing that there is no ‘view from nowhere’ (Nagel 1986), relational thinking clarifies that sustainability problems and solutions arise partly from the perspectives, values and contexts through which they are apprehended. This places sustainability scientists fundamentally in the complex issues they seek to address (Van Kerkhoff 2014). Researchers are no longer positioned as directors of social-ecological change, but as (relatively minor) participants alongside innumerable others in the diverse and unruly pursuit of transformation: social movements, policy initiatives, community networks, science-business partnerships, arts projects, agricultural collectives, management practices, and many others (Stirling 2014). There are consequently many contributions researchers might make to ‘informed agitation’ for sustainability (Clark and Harley 2020), including stimulating new ideas, generating useful knowledge objects, or devising new practices. Such contributions might be judged in terms of their ‘justness,’ ‘usefulness,’ ‘creativity,’ ‘criticality,’ ‘thoughtfulness’ and ‘care,’ and many others, as well as their ‘efficiency.’ Experience has shown that contributions of research to change are uncertain, unpredictable and uncontrollable (Clark et al. 2016). And in the sense that transformations imply a change to the status quo, many contributions might be deliberately ‘inefficient’ within dominant logics.

One area of consensus in sustainability science, including leverage points and systems thinking, has been that challenging existing paradigms and ways of knowing – especially those informed by Cartesian dualism – are important in addressing sustainability challenges (Folke et al. 2011; Abson et al. 2017). The goal is not to arrive at a single ‘best’ perspective, but to contribute to ongoing learning. Relational thinking provides resources to re-work and re-think conventional research practices and residual, often difficult-to-detect modernist assumptions. We have found relational thinking useful in our own (un)learning towards better comprehension of complexity and, notably, so have many of the citizens, communities, practitioners, scientists and policy-makers we have worked with (West et al. 2020). Many of these actors have a much better grasp of relationality and complexity than we do. The emphasis on learning in sustainability science evokes the pragmatist conception of collective inquiry to address public problems (Dewey 1927). We agree with Raymond et al. that processes to nurture reflexivity and dialogue are vital here. In the pragmatist tradition, this does not require convergence or integration between perspectives, but rather a mutual commitment to ‘going on together’ while respecting differences (Verran and Christie 2011). We thank Raymond et al. for sparking the conversation and look forward to ongoing collective learning in the years to come.

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ORCID

Simon West @ http://orcid.org/0000-0002-9738-0593
L. Jamila Haider @ http://orcid.org/0000-0002-0265-5356
Sanna Ståhlman @ http://orcid.org/0000-0002-3398-2640
Stephen Woroniecki @ http://orcid.org/0000-0003-1894-2859

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