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Short communication

Climate change, values, and the cultural cognition thesis

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ABSTRACT

Recently the importance of addressing values in discussions of risk perception and adaptation to climate change has become manifest. Values-based approaches to climate change adaptation and the cultural cognition thesis both illustrate this trend. We argue that in the wake of this development it is necessary to take the dynamic relationship between values and beliefs seriously, to acknowledge the possibility of bi-directional relationships between values and beliefs, and to address the variety of values involved (e.g. personal, epistemic and cultural values). The dynamic relationship between values and beliefs, we claim, highlights the need to bring ethical considerations to bear on climate change communication. In particular, we must ask whether it is acceptable to tailor information about the risks of climate change in an effort to maximize communicative effectiveness given the values of the target group.

The need to talk explicitly about values in any serious study of risk perception and human adaptation to climate change has come into focus of late. This is most welcome, but we believe that two prominent recent contributions to the discussion underappreciate the significance of the dynamic relationship between values and climate change adaptation (Kahan et al., 2012; Adger et al., 2013). The novelty of these contributions lies in the clarity with which they insist that cultural perspectives affect the uptake of scientific evidence on climate change. But although this is important, it does not go far enough, and it is vital that we do not neglect other aspects of the complex belief-value dynamic involved. In this dynamic values other than cultural ones exert influence. The processes at play are also very probably bi-directional, with new evidence affecting valuations. This raises an ethical question about climate science communications: Should these be limited by the fear of threatening the values of one or another group if we know that values are both diverse and shaped to an extent by scientific information?

1. Value-based approaches to climate change adaptation

The "values-based" approach (O'Brien and Wolf, 2010) notes that the values we bring to climate change vary across

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societies and cultures, and infers that the variation is vital to proper explanation of the human response to environmental risk.[1] Adger et al. (2013, 113) agree:

> Cultural perspectives help to explain differences in responses across populations to the same environmental risks. Recent research shows that information about climate change does not connect with all cultures and worldviews in the same way. Douglas and Wildavsky argue that societies with shared values and beliefs produce their own selective view of the natural environment, which influences how they interpret and respond to risk.

This sounds sensible – unexceptional, even. In fact, however, the notion that populations respond differently to the same risks is highly problematic. ''Same'' in what sense? The same probabilities? ''Probabilities'' in what sense? Personal subjective probabilities? Frequencies? Objective (physical) probabilities? And who says that the outcome is undesired? Whose values must be respected?

Sensitivity to cultural perspectives enables us to identify the events and activities that populations perceive as risky (always remembering that risk is a function of uncertainty and values). Culturally sensitive risk analysis has been particularly important as antidote to the economist's sometimes exclusive focus on economic and material values. In the present context it delivers ''a deeper understanding of what climate change means for society'' (O'Brien and Wolf, 2010, 239). Climate change means different things to different individuals and groups already simply because we value things differently. The Norwegian notion of *friluftsliv* (i.e. open-air living), for instance, is arguably a distinctive value that has to be acknowledged if we are to understand attitudes to climate change in Norway (O'Brien, 2009, 172).

Important as this insight is – and for practical purposes it is often crucial – expressed in the way it is above it is old news, theoretically speaking. Belief and preference, or valuation, are the key inputs in the received model of both decision-making and risk-analysis. Preferences and valuations are similar in kind to the ''broader and subjective interpretation of values'' these authors advocate.[2] No one should be surprised that such values are important in risk and adaptation. The fact that it is old news from a theoretical standpoint does not, in itself, render the insight unimportant. Climate policy will be at least as important as climate science in any effort to secure the future of our planet.

What would be surprising from the decision-making perspective is a value-based approach recognizing only societal or cultural values. It seems to be a mistake to argue that it is only values of these kinds (in the absence of personal preferences and desires) that have a role to play in explaining how humans respond to climate change risks, and we would like to point out that Adger and colleagues do not claim this (for instance, Adger et al. (2013, 112) say that ''material aspects'' of climate change are conventionally included in policy analysis).

To hold otherwise would be to follow those social scientists (e.g. Bradbury, 1989) who have assumed that risk is either *a physical attribute* (Starr, 1969) or *socially/culturally constructed* (Wynne, 1980; Douglas and Wildavsky, 1983). We observe that risk can also be conceived as *subjective* – determined by beliefs and desires (Ramsey, 1990; Savage, 1954), *perceived* – fixed by contextual and personal factors (Slovic, 1999), *felt* – when it is conceived as risk-as-feelings (Loewenstein et al., 2001), or *epistemic* – governed by what we think we know when we are acting (Gärdenfors and Sahlin, 1983; Sahlin and Persson, 1994). We will not go into details here, but see for example Blennow et al. (2014) for a detailed exposition and critique of the minimalist perspectives in which risk is regarded as either physical or social (see also Slovic (1998) for a related position).

A preoccupation with society or culture in the analysis of values, risk and adaptation appears, therefore, to be an artefact of the researcher's own interest, not an accurate delineation of the kinds of value that can exert influence on a decision-maker. Any value-based perspective needs to acknowledge value *plurality*. How these plural values relate is of course an intricate question. We simply note that to answer this question we need a framework broader than a merely cultural one.

2. Cultural perspectives and evidence-formation

There is a more interesting reading of Adger et al. (2013). To begin with they talk about cultural perspectives. Such perspectives include cultural values, but also what we call cultural beliefs. This inclusion should be straightforward in the context at hand; culture is defined by Adger et al. (2013, 112) as the symbols that create meaning, including beliefs, rituals, art and stories that create collective outlooks and behaviours. Crudely speaking, this opens up two ways in which cultural perspectives can influence risk perception and decision-making: via values or via beliefs. The authors also state, however, that cultural perspectives may ''connect'' with scientific information and knowledge in different ways. This may refer to the straightforward connection we mentioned above, with information deriving from one source and values from another. But the connection might be more complex, as one source may influence the other. Hence we interpret the two ideas here to be:

(1) Cultural perspectives consist of beliefs and values that affect environmental decision-making.
(2) Cultural perspectives influence the uptake of (scientific) evidence.

So far we have talked about (1). We have argued that (1) needs to be expanded since things other than cultural

[1] The conception of values assumed here does not entail that values can be expressed as monetary worth. Instead, values relate ''to principles or qualities that are intrinsically desirable.'' (O'Brien and Wolf, 2010, 232). O'Brien and Wolf refer to this conception as a ''broader and subjective interpretation of values'' (ibid.). In general we agree with this interpretation, but we prefer to refer to these broader and subjective ''values'' as preferences or valuations.

[2] Belief, conceived in this way, concerns the probability dimension of the decision or the risk-analysis, and preference or valuation belongs to the evaluative dimension.

perspectives are important for environmental decision-making. But even an expanded version of (1) is rather trivial, and perhaps harmless, without (2).

Idea (2) emphasizes the belief-value dynamic. Thus, for instance, the way in which we update our beliefs depends on what we already believe and prefer. Equally, doxastic updates might change our narratives and cultural values. We cannot fully explain how scientific communication affects climate change adaptation without understanding this dynamic. That Adger et al. (2013, 113) intend this interpretation of their claim becomes evident when they continue:

> Climate change narratives often interact with other beliefs to motivate responses, which in some cases may not be consistent with the 'rational' responses advocated by institutions promoting adaptation. For example, people in atoll islands in the South Pacific merge scientific information about climate change with pre-existing narratives about cultural decline in ways that discourage adaptation.

To substantiate (2), and thus be in a position to explain how cultural (and other) beliefs and values interact with the uptake of scientific (and other new) evidence, it is necessary to analyse the various pathways of interaction. We wish to draw attention to the following three possibilities:

First, *belief–belief flux*. There may be interaction between scientific evidence and cultural beliefs. This is the interaction not of values and beliefs, but of beliefs acquired at different times. We need to know through what mechanisms new scientific knowledge is being taken up given already present cultural beliefs. What is known as confirmation bias, which arises when people tend to search for, or interpret, information in a way that confirms their preconceptions (Bacon (1620/2000); for a more recent review, Nickerson (1998)), is a well-known mechanism here. Similar mechanisms are sometimes said to operate on more aggregated levels. Kuhn's idea of a paradigm is often overstated, but it clearly has an application in some cases where a well-developed structure of principles and ideal examples is established in a community. Kupperman (1982) reports that English settlers who arrived in North America in the early colonial period believed that climate was a function of latitude. Newfoundland, which is south of London, was expected to have a moderate climate. Despite their experience of far colder temperatures and crop failures, the colonists clung to their latitude-based expectations (Weber, 2010, 333) Further examples could readily be developed. However, we need to know whether these mechanisms are applicable, and if so to what extent when it comes to scientific evidence and cultural beliefs about climate change and related matters.

Second, *value–belief dynamics*. New scientific evidence might be incompatible with certain cultural beliefs, and these beliefs might be providing support for certain cultural values. I may be in favour of *friluftsliv* because I think it is good for my physical and mental health to spend time in the wilderness, and also that such living fosters environment-friendly conduct. Novel scientific findings might counter-evidence these beliefs and thus jeopardize *friluftsliv* as a cultural value. Existing values, then, can be threatened when cultural beliefs are modified in light of new scientific knowledge – although it is also true that the prospect of this may give rise to a value bias favouring refusal to take up the new scientific evidence.

This value–belief dynamic can be channelled in at least two ways. It can run directly from values to beliefs, as when the value I have inhibits me from dropping a particular belief about its beneficial consequences. This is the kind of dynamics we are primarily interested in.

But the influence can also be indirect: it may disqualify certain evidence-forming procedures by which the new scientific evidence has been generated. My own array of cultural values might be exactly what stops me from exploring certain kinds of situation, with the result that these very values will not be challenged. My ethical views can tell against certain kinds of experiment; and the absence of the potential findings of that experiment, or of the evidence it would provide, might sometimes be precisely what is upholding these values. Naturally such an influence could also be positive: a particular set of cultural values could encourage me to undertake relevant exploration and belief revision.

Third, and presumably most importantly, since measures to adapt (and indeed adaptation and maladaptation themselves) might affect the things we value, our acceptance of scientific evidence as a basis for action takes place as we keep an eye on its effects on the things we value. This might give rise to the following interaction between cultural values and scientific evidence-formation.

Let us assume that A is something we (and the culture to which we belong) value, such as winter sports. Let us also assume that new scientific knowledge suggests A is at risk (global warming). Clearly this piece of scientific evidence may have an effect on us. The fact that we value A is not immaterial when it comes to the question whether we are likely to take up the new scientific evidence. However, the outcome might be indeterminate. On the one hand, there should be a value bias in favour of not taking up the new evidence, since this refusal will reduce the perceived risk (and thus prevent the current winter holiday from being spoiled by worries about future such holidays). On the other hand, there should be a value bias in favour of taking the evidence up, since it identifies a potential threat to A (we have to do something now, or else our children might not have the opportunity to go cross-country skiing!). It is clear that, to the extent that risk is about knowledge too, we have reason to recognize the threat as a serious possibility even though it might not be the most likely scenario (Gärdenfors and Sahlin 1982; Sahlin and Persson, 1994).

3. The cultural cognition thesis

An intriguing finding has recently been reported (Kahan et al., 2012, 732):

> Members of the public with the highest degrees of science literacy and technical reasoning capacity were not the most concerned about climate change. Rather, they were the ones among whom cultural polarization was greatest.

This looks like bias: at any rate, let us refer to it as a "culture bias". Interestingly, it appears not to fit the heuristics and

biases pattern developed in recent dual process thinking (see e.g. Kahneman, 2011). Normally bias is held to result from lack of cognitive resources; but culture bias becomes stronger with increased resources. Dual process thinking does not appear to be straightforwardly applicable to this phenomenon.

The finding also casts doubt on the familiar ''knowledge-deficit'' model which says that laypeople have limited concern about climate change issues because they are poorly equipped with scientific information and/or the capacity for scientific thinking. For instance, civic scientific literacy has been conceptualized ''as the level of understanding of science ... needed to function as citizens in a modern industrial society'' (Miler and Pardo 2000, 55). The knowledge-deficit model does not account for the cultural polarization observed among those who are scientifically literate. Nor does it account for the fact that less educated individuals are sometimes more concerned about risk (together with the scientists) than those with higher levels of education (e.g. see Slovic, 1999).

As an alternative explanation Kahan et al. (2012, 732) formulate the ''cultural cognition thesis'' (CCT):

> ... individuals, as a result of a complex of psychological mechanisms, tend to form perceptions of societal risks that cohere with values characteristic of groups with which they identify.

In itself, CCT does not explain why the risk perceptions of scientifically literate people deviate from those of others. Something has to be added to the thesis along the lines that the former are better at forming coherent personal world-views, or form stronger (more certain, more stable) ''cultural'' values and preferences. Kahan et al. (2012) appear to prefer the first of these additions. They say: ''Fitting information to identity-defining commitments makes demands on all manner of cognition'' (2012, 734). And referring to ''ordinary citizens who are equipped and disposed to appraise information in a reflective, analytic manner'', they now state more explicitly (Kahan et al., 2015) that ''... they often become even more culturally polarized because of the specific capacity they have to search out and interpret evidence in patterns that sustain the convergence between their risk perceptions and their group identities''.

4. Effects and ethics of science communication

In concluding Kahan et al. (2012), the authors remark that CCT implies that effective science communication cannot be guaranteed simply by ensuring that the information is sound and clear. From this follows a recommendation. We want to point out this recommendation is not part of CCT itself, since CCT is a descriptive claim about cultural cognition. It is what we might call ''Kahan's recommendation''. The recommendation is that to be effective science communication should, in certain ''pathological'' situations, steer clear of threats to any cultural values in the offing. This may well be correct, and indeed important in scientific comms. However, it inevitably raises some ethical issues.

> As citizens understandably tend to conform their beliefs about societal risk to beliefs that predominate among their peers, communicators should endeavor to create a deliberative climate in which accepting the best available science does not threaten any group's values (Kahan et al., 2012, 734).

Similar formulations occur in the most recent paper by Kahan et al. Science communication ''must avail itself of the cues necessary to assure individuals that assenting to that information will not estrange them from their communities'' (Kahan et al., 2015). Taken to an extreme, this would mean that in some cases the only way to avoid browbeating any group over its values may be to misinform, deceive or lie about the ''best available science'', simply to bluff the public into action. We are sure that this is not what Kahan et al. have in mind. They would no doubt respond that we should not exaggerate the problem and insist that CCT entails merely that in ''pathological'' situations we will need to adopt something like Kahan's proposed strategy in order to effectively communicate. However, even with these provisos Kahan's recommendation does little to discourage contemplation of the need for what looks like questionable disingenuousness.

A fundamental problem with the recommendation is that CCT highlights just one of several potential implications of the belief–value dynamic. CCT clearly assumes that values are *cognitively prior* to beliefs. But whether or not this implies the temporal priority of values, or that values are somehow more entrenched than beliefs, it seems that beliefs are just as often cognitively prior to values. It may well be that, in another manifestation of the dynamic, new scientific evidence slowly brings about modifications in group values. Certainly, the risks involved in the communication strategy Kahan et al. recommend might be serious enough to show that this possibility should be scrutinized first.

Openness, prudence, reliability, trustworthiness and truthfulness – these are but a few of the virtues and values that seem to clash with the communication strategy recommended by Kahan et al. A tendency to rely on perceptions of risk cohering with values shared by like-minded people will generally lead us to become one-eyed when it comes to evidence formation and science communication. One directs a spotlight on evidence that does not distress one's own group, or the group one wishes to communicate with, and leaves other evidence in the darkness. On this interpretation the communication strategy recommended by Kahan et al. (2012) becomes a firewall – a fortification made of values that protects us from good science as much as bad. The strategy positively encourages us to look for evidence that is too narrow, readily available, and skewed in favour of social and cultural values, and to translate what we hear into what we are already seeking.

Empirical evidence indicates that today trust in research is decreasing. There may be many reasons for this. National audit offices are nowadays active when it comes to auditing universities – and not just their use of resources, but also their academic work (Sahlin, 2013). Inadequacies, weaknesses, and uncertainties come to light through the openness and disclosure that this accountability requires (Drenth, 2012).

This can affect levels of trust negatively. And declining trust in research is of course a serious problem.[3]

Does over-enthusiastic adoption of Kahan's recommended communication strategy explain, at least in part, declining trust in research? In this short text we cannot explore this hypothesis. However, it does not seem far-fetched to suggest that if we conclude that values have to be respected if science communication is to be successful, rather than championing the hallowed scientific virtues just listed, we shall only have ourselves to blame when distrust in science deepens.

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[3] Sometimes, of course, we expect more from science than it is capable ideally of providing, and it can be disappointing to find out that (climate) science never furnishes proofs (Oreskes, 2004).