

Researchers explore the use of decision pathways to inform climate engineering policies

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(Phys.org)—The acceleration of anthropogenic climate change has increased the urgency of calls for technological approaches to the

problem. It's a global challenge at a scale requiring the mobilization of resources that only nation states are capable of, and public input into policies related to mitigating climate change is particularly important. Traditional survey techniques provide a snapshot of public opinion from which policymakers can draw conclusions, but such surveys have inherent limitations because people use a variety of mental models to interpret information and make sense of policy options.

A collaborative of researchers from the U.S. and Canada propose a decision pathway approach that offers some of the benefits of traditional survey techniques, while also capturing the reasoning of deliberations within groups, and helping participants to deepen their knowledge of issues and solutions. The researchers have modeled this approach with a decision pathway design that addresses climate engineering technologies, and published their results in the *Proceedings of the National Academy of Sciences*.

The authors write, "Decision pathway survey designs seek first to inform people, about both their own values and the facts relevant to multisided public policy choices, and then to provide [decision makers](#) with information about both what and how citizens think without reliance on more costly, and less scalable, qualitative research methods."

The prescriptive model adopted for the study is PrOACT, an acronym describing its five basic steps: understand the problem context; clarify objectives; define alternatives; identify consequences; highlight key tradeoffs. Responses are iterative, as participants revisit earlier questions in light of information presented during later stages.

The pathway survey emphasized climate engineering technologies that capture and store carbon dioxide before it is released into the atmosphere, or technologies that reflect sunlight and its accompanying solar heat before it reaches the Earth's surface. Keeping in mind that any

survey design wields influence over participants as they construct a response, the researchers focused explicitly on the reasoning processes used by individuals as they went through the five steps of the decision pathway.

Among their findings:

- A large majority (70 percent) of those who described themselves as "not at all concerned" about [climate change](#) chose "to do nothing more" to mitigate climate change, while the remainder supported transportation alternatives.
- Shifts in opinions on alternatives occurred in the other groups, who described themselves as "not very concerned," "fairly concerned," and "very concerned."
- There is an overall pattern among all groups to regard their own views on climate governance as likely to be shared by others.
- Significantly, all groups rated all categories of risks associated with geoengineering as more likely than all categories of benefits.

The authors write, "Results underscore both the nuanced responses of participants and the need for survey methods that can capture and reflect this conditional reasoning. As one example, consistent support for geoengineering exists when interventions involve mostly natural means, including use of biotic infrastructure (e.g., planting new forests, cultivating plankton and algae) and improvements to built infrastructure (e.g., modifying buildings and surfaces to increase reflectivity), across the spectrum of concerns."

The authors note that one shortcoming of their study is that it lacks a

control group. Further investigation of decision pathway methodologies could make better comparisons with results from conventional surveys conducted in parallel.

More information: Robin Gregory, Terre Satterfield, and Ariel Hasell. Using decision pathway surveys to inform climate engineering policy choices. *PNAS* 2016 ; published ahead of print January 4, 2016, [DOI: 10.1073/pnas.1508896113](https://doi.org/10.1073/pnas.1508896113)

Abstract

Over the coming decades citizens living in North America and Europe will be asked about a variety of new technological and behavioral initiatives intended to mitigate the worst impacts of climate change. A common approach to public input has been surveys whereby respondents' attitudes about climate change are explained by individuals' demographic background, values, and beliefs. In parallel, recent deliberative research seeks to more fully address the complex value tradeoffs linked to novel technologies and difficult ethical questions that characterize leading climate mitigation alternatives. New methods such as decision pathway surveys may offer important insights for policy makers by capturing much of the depth and reasoning of small-group deliberations while meeting standard survey goals including large-sample stakeholder engagement. Pathway surveys also can help participants to deepen their factual knowledge base and arrive at a more complete understanding of their own values as they apply to proposed policy alternatives. The pathway results indicate more fully the conditional and context-specific nature of support for several "upstream" climate interventions, including solar radiation management techniques and carbon dioxide removal technologies.

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