# Taking tough decisions for the climate change problem: Geoengineering vs. Mitigation

D. Amelung & C. Schwesinger

*University of Heidelberg, Heidelberg, Germany*

## Introduction

Decisions in the context of climate change must deal with dynamic complexity (Sterman & Sweeney, 2002), which means that they have to be based on uncertain predictions about the future. This is why we can conceptualize them as decisions under uncertainty or risky decisions. The Risk Defusing Operator (RDO) theory deals with this kind of risky decisions (Huber, Beutter, Montoya, & Huber, 2001). It argues that within quasi-realistic scenarios most people are willing to choose riskier alternatives if they can identify an RDO. An RDO is an additional action to be taken in order to reduce the risk connected with the chosen alternative. This theoretical decision pattern can be applied to the so-called 'moral hazard' argument: the idea that the future prospect of having available a fast technological solution to climate change (so-called 'geoengineering') might further corrupt the (already insufficient) efforts to mitigate $CO_2$ emissions (The Royal Society, 2009). People could perceive 'geoengineering' to be an RDO already influencing present decisions – in this case indicating a 'moral hazard' - or not influencing decisions until some time in the future. This is why the inherent long-term perspective of this problem is particularly interesting against the background of the moral hazard argument.

We address the following exploratory questions: Can the RDO theory generally explain decision behavior in complex real-life problems like climate change? Do the decisions of lay persons indicate a 'moral hazard' or not? Is it possible to identify a cognitive process pattern leading to the resulting decisions?

## Method

100 participants (academic sample) will work on a climate change decision scenario consisting of the (combinable) alternative choices *mitigation of $CO_2$ emissions* and three *geoengineering* options. The scenario will be presented in form of a one-to-one interview using the conversation-based Active Information Search method and participants will be asked to think aloud while performing the task (Huber, Wider, & Huber, 1997; Williamson, Ranyard, & Cuthbert, 2000)

## Analysis of Results

The qualitative data of the protocols deriving from the interviews will be transformed into quantitative data according to a coding scheme. The latter will be adapted based on an existing category system used in other studies (Huber et al., 2001; Wilke, Haug, & Funke, 2008). As a next step, the final decisions of the participants will be classified into decision types (e.g. "Mitigation with RDO SRM"). The decision type will then be used as DV in a logit analysis with IVs describing the decision process, for example the amount, type and sequence of information that was asked for by the participants in order to help identify underlying mechanisms leading to the decisions.

## Discussion

Results could help extend the applicability of RDO theory to real-life decision problems involving a long-term perspective and thus could help us understand how people deal with the specific characteristic of dynamic complexity. Secondly, first empirical indications for or against the issue of 'moral hazard' could be found. Finally, the rich information about on-task cognitive processes deriving from the protocol data could give useful exploratory insights into the underlying mechanisms leading to people's spontaneous acceptance or non-acceptance of a newly emerging technology

like geoengineering. This is especially informative at this early stage of the geoengineering debate (with the subject largely unknown to lay persons).

## References


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