Article:
Taylor, AL orcid.org/0000-0002-8949-1234 (2019) General and specific motivations. Nature Climate Change, 9 (2). pp. 89-90. ISSN 1758-678X

https://doi.org/10.1038/s41558-018-0395-3

Climate change adaptation:
General and specific motivations

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Climate change adaptation encompasses a wide range of behaviours in response to a variety of short- and long-term risks. Now meta-analyses identify which motivational factors are consistent predictors of adaptation action, and which are more context-specific.

The impacts of climate change are already being felt, threatening lives and wellbeing. While greenhouse gas reduction is critical to reducing the threat posed by climate change, past emissions mean that increases in the frequency of events such as Hurricane Harvey[1] and the 2018 European heatwave[2] are unavoidable. Societies around the world therefore face the challenge of limiting the harm that such natural hazards cause[3]. To promote successful adaptation, it is vital to understand what drives support for adaptation policy and willingness to engage in adaptation behaviours. Writing in Nature Climate Change, van Valkengoed and Steg find that beliefs about the effectiveness of adaptation measures and one's own ability to

implement them are consistent predictors of adaptation, but the effects of other motivational factors such as trust are dependent on the nature of the adaptation behaviour in question[4].

The Intergovernmental Panel on Climate Change defines adaptation as *"*adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*"* (IPCC, AR4)[5]. Under this definition adaptation includes responses to immediate climatic hazards, such as actions taken following severe weather warnings, as well as preparedness for longer term risks, such as building resilience against projected increases in extreme weather. Adaptation can also cover a wide range of behaviours, including policy support, evacuation, resettlement, purchasing insurance, and making structural changes to homes. Consequently, it is important to identify factors that motivate adaptation behaviour across a broad range of contexts, as well as those that drive willingness to engage in some types of adaptation behaviour but not others. A large number of research papers have assessed the determinants of adaptation behaviours for various climate impacts and timescales. However, drawing broader lessons about what can be done to support adaptation is challenging, as individual studies are context-specific and the results may not always generalise across all adaptation behaviours.

To address the need for a cohesive overview of this research field, van Valkengoed and Steg use meta-analyses to synthesize data from 106 adaptation studies. Their findings show that beliefs about the opinions and behaviour of others (social norms) and negative emotional response towards climate hazards are consistently strong predictors of adaptation engagement. Likewise, individual beliefs about the effectiveness of adaptation behaviours and perceived ability to undertake them (self-efficacy) appear to be critical to their adoption across contexts. For those working to assess and build adaptive capacity at community levels, this reinforces the importance of considering not only what can feasibly be done to reduce the

threats posed by climate change impacts, but the extent to which community members perceive measures to be effective, supported by others, and within their ability to implement.

However, not all motivational factors were found to have the same effect on all types of adaptation behaviours. For example, in keeping with the broader risk preparedness literature[6] , van Valkengoed and Steg found that trust in government was linked to greater compliance with emergency warnings systems (e.g. to evacuate in the face of a hurricane). However, trust in flood barriers put in place by authorities was a negative predictor of home flood-proofing. In other words, trust in guidance to take immediate protective action increases the likelihood of compliance, but overconfidence in structural defences impedes willingness to proactively undertake individual risk-preparedness measures, perhaps because it reduces the perceived need for adaptation. As another example, climate change belief was linked to policy support but not greater willingness to undertake protective actions. These examples illustrate the importance of assessing the role of different motivational factors across different types of adaptation, as a factor that increases engagement in one type of behaviour may be a barrier to others.

The core strength of the meta-analysis approach used by van Valkengoed and Steg is that it allows data from studies examining different adaptation behaviours to be analysed together, allowing for more robust generalisations and recommendations. The inevitable limitation is that it is restricted to those hazards, locations, timescales and behaviours for which quantitative studies exist. For instance, while developing countries are most vulnerable to the impacts of climate change[7], the fact that fewer quantitative surveys on adaptation behaviours have been conducted in these regions means that they are under-represented in these analyses. Likewise, hurricanes and flooding are heavily represented in the analysis, while other climate impacts such as vector borne diseases and supply chain disruption are

absent. This highlights a need for work assessing the predictors of adaptation behaviours where evidence is currently lacking.

In all possible futures, adaptation to a changing climate is necessary to limit harm and support wellbeing[3]. This not only requires well-informed policies and technical measures, but solutions that elicit public support and engagement[8]. The work of van Valkengoed and Steg[4] shows that the success of adaptation initiatives is likely to depend on people's beliefs about their effectiveness and their own ability to implement them. Above all however, they demonstrate the crucial importance of continuing to explore what drives different types of adaptation to different climate impacts.

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