



BEHAVIORAL INSIGHTS FOR CLIMATE ACTION

POLICY BRIEF
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EXECUTIVE SUMMARY

In order to mitigate climate change, a rapid behavioral shift towards a more sustainable lifestyle is required.

However, the necessary behavioral changes are occurring only quite slowly and it is unclear whether carbon emissions can be reduced in time to prevent drastic climatic consequences. The relative lack of efficient climate change action in the population may be explained to some extent by the abstract nature of climate change, which poses a significant challenge to human perceptual, cognitive, and affective processing mechanisms.

This results in a lack of emotional and moral responses towards climate change, which would however be necessary to motivate significant behavior change.

Policy interventions informed by behavioral insights can facilitate the processing of the individual relevance of climate change and integrate psychological levers addressing self-interested, moral, and social aspects of climate action.

They can guide action by communicating the environmental impact of concrete behaviors, pointing out which are the most effective actions an individual can take up.

To avoid demoralization, they need to emphasize that collective mitigating action can be efficient to address the challenge posed by climate change.

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1. SCOPE OF THE PROBLEM

The climatic changes that are increasingly being observed are largely driven by human activities linked to resource overconsumption and overreliance on fossil energy sources. By affecting the environment, they are expected to contribute to major social problems such as resource conflicts, migration issues and political instability¹. Accelerating the transition towards a more sustainable lifestyle is thus one of the most urgent tasks facing our planet and its inhabitants.

While most people nowadays agree that anthropogenic climate change is real and that its effects will be felt within their lifetime², too little is done to translate this into concrete sustainable actions, and it is as of yet unclear whether carbon emissions can be reduced fast enough to prevent drastic climatic consequences over the next decades.

This is especially unsatisfactory given that considerable emission reductions could be achieved by implementing a relatively small number of highly effective behaviors. For instance, it has been estimated that by implementing 17 household actions related to home weatherization, efficiency upgrades, equipment maintenance, thermostat adjustments, and changes in driving behavior, more than 120 million tons of greenhouse gas emissions could be saved per year in the United States alone, corresponding to 7.4% of 2009 national emissions³. Current sustainability goals set by national and international bodies aim to reduce greenhouse gas emissions by 40% until 2030.

Sustainable behavior change can thus substantially contribute to these goals.

Policy interventions to promote sustainable decisions and behaviors are predominantly based on information provision (e.g., communication campaigns), financial incentives (e.g., CO2 taxes), and legal bans (e.g., inefficient lightbulbs). Communication strategies aiming to inform citizens and motivate voluntary sustainable behavior have often proved inefficient⁴.

Legal and fiscal measures can lead to reactance and protest, making them difficult to implement. The behavioral sciences can offer important insights into human judgment and decision-making processes which can be used to improve the design of informational, fiscal, and legal instruments as well as to develop new complementary tools to promote behavior change.

This policy brief summarizes relevant state-of-the-art knowledge from the behavioral and neural sciences addressing the barriers that prevent people from recognizing the urgency to act on climate change, and proposes behavioral levers and intervention strategies to encourage climate action.

The brief targets policy makers at the national and international level as well as non-governmental organizations who aim to develop interventions to promote large-scale sustainable behavior change.

2. VIEWS FROM SCIENCE

Climate change: A challenge for the human brain.

One reason for the failure to show a rapid, concerted reaction to climate change is the fact that human information-processing mechanisms are not optimized to recognize the threat that is posed by climate change. Across millennia, homo sapiens mainly had to deal with immediate and concrete dangers that could be seen, heard, felt, touched or smelled.

Climate change is largely removed from our direct sensorial experience. It is a slow-moving, complex, abstract, probabilistic phenomenon that can only be studied in statistical terms, e.g., by tracking long-term changes in temperature patterns.

Human judgments and decisions are based on the interaction of two processing styles: A fast, intuitive processing style based on associations and similarities, strongly linked to affect and emotion, and a slower, rule-based processing style requiring cognitive effort.

The intuitive processing style uses personal experiences as input, while the rule-based processing style can operate on more abstract input such as statistics about climate change.

Usually the two systems operate together and integrate analytic thinking and experience-based affective signals into adaptive behavioral reactions.

In the case of climate change, analytic processing may conclude that climate change statistics point toward a serious threat.

However, if the intuitive system, which requires experiential input, fails to send the corresponding emotional warning signal, a discrepancy between the output of the two systems occurs⁵.

People who fail to be alarmed about a potential danger do not take the necessary precautions. People who do experience emotional reactions towards climate change judge the related risks as higher and are willing to change their behavior to a larger extent⁶.

In addition to its abstract, nonexperiential nature, the worst consequences of climate change are perceived as occurring in the future as well as in other countries, and thus as being largely the concern of other people. This psychological distance adds to the difficulty in processing the personal relevance of climate change.

Recent neuroscientific work has shown that only people with altruistic core values, who do express concern about future consequences of climate change, show increased activation in brain regions involved in creating detailed mental simulations of the future⁷, potentially allowing them to create a more personal vision of the future.

Behaviorally informed policy needs to overcome these processing limitations by focusing on directly experienceable aspects of climate change and by leveraging multiple motivational systems to increase the personal relevance of climate change action.

Importantly, this depends on the psychological characteristics and information processing styles of the receiving individual: information about proximal consequences will only lead to increased climate change concern if they are actually interpreted as being caused by climate change⁸.

Developing immersive virtual reality simulations based on concrete scientific projections that vividly illustrate local climate change consequences may be a promising avenue for future intervention development.

Self-interested pathways to climate action.

In their everyday decisions, people tend to prioritize actions that have immediate positive consequences for themselves or that avoid negative consequences.

Trying to get them to engage in sustainable behavior purely for environmental benefits, which may not even be visible for decades to come, is at odds with this behavioral default.

Given that sustainable behavior usually does not yield much immediately discernible personal benefit (to the contrary, it is often perceived as resulting in reductions in personal comfort or opportunities), it is important to make people aware of the potential co-benefits that come with a sustainable behavior shift.

Relevant examples are health benefits resulting from better environmental conditions or an increase in social contacts by participating in the sharing economy.

Another individual benefit of climate action that tends to be overlooked in policy-making is related to potential gains in social status as a consequence of climate action.

Engaging in an activity which is costly for oneself (e.g., in terms of money, time, or effort), but which benefits others can act as a costly signal demonstrating the ability to incur these costs for the social group, and can result in an increase in social status.

Similarly, publicly investing resources for the benefit of the environment has been identified as a way to increase one's social status⁹. Importantly, this mechanism can only work if the actions are highly visible to others. Interventions aiming to use this lever should thus communicate widely about people or institutions who show exemplary (and costly) sustainable behavior to promote the social reputation of these actors, for instance by creating awards or ranking lists.

Behaviorally informed policy should consider to what extent immediate co-benefits of sustainable action (health, social aspects, status) are present and communicate accordingly.

Individuals who are aware of the co-benefits of climate action show substantial increases in their motivation to act¹⁰.

One exception here may be financial co-benefits. Emphasizing the financial advantages of sustainable action may lead to a crowding out of the intrinsic motivation to act pro-environmentally as soon as money is considered the main driver of the behavior¹¹.

Moral pathways to climate action.

In addition to potential personal benefits that can accrue, human behavior is also motivated by considerations about what is the morally right or wrong thing to do.

Research in moral psychology has shown that these judgments are strongly informed by emotional reactions. As climate change often fails to elicit strong affective responses, it is not surprising that climate change is not perceived as a moral issue by a large number of people¹².

Moral convictions are a strong force moving people to action, it is thus important to increase the extent to which climate change resonates with peoples' ideas about morality. Importantly, this does not mean that policies and communications should be "moralizing", but should aim to connect climate change to moral notions that already are present in the individual ("moral piggybacking").

Cross-cultural research into the foundations of human morality has identified five relatively universal topics which affectively resonate with moral judgments.

These include concerns about not harming others and about avoiding injustice, but also concerns about respecting group membership and loyalty, concerns about hierarchy and duty, and concerns about preserving purity and sacredness.

Behaviorally informed policy should integrate the diversity of moral narratives that are possible in the context of climate change.

For instance, in the media and in persuasions campaigns, climate change mitigation is often communicated with a focus on harm and fairness concerns, emphasizing that the planet should not be harmed and that future generations or developing countries are most heavily affected by climate change.

Emphasizing additional moral concerns may create emotional and moral reactions in a larger number of people. For example, communicating the need to avoid polluting our life environment, to be a steward of the earth, or framing climate action as a moral obligation for Christians as done by Pope Francis, can trigger moral considerations in a larger group of people.

This strategy may also help reach audiences who may be initially opposed to sustainable action (for instance, conservative audiences show higher environmental concern after messages emphasizing the need to reduce pollution¹³).

To be effective, the strategy must be based on robust empirical insights about the moral notions that resonate most strongly with the target groups of the intervention.

Social pathways to climate action.

Humans as a fundamentally social species are strongly influenced by their perception of what others are thinking and doing. Moreover, they have the ability to efficiently coordinate their actions to tackle collective challenges.

Individuals validate their actions and benefit from collective learning processes by adapting their judgments and behaviors to the standards of their social group. If climate change is viewed as an important risk that requires action by the social network, individual willingness to act increases.

Providing information about the opinions and actions of a social reference group can thus be an important lever for action. Field experiments have shown, for instance, that households significantly reduced their electricity consumption when presented with the information that they consume more than their neighbors. Households consuming less than average maintained their low consumption if this information was accompanied by an affective signal (a smiley) indicating that their consumption behavior was the socially validated behavior¹⁴. This study has become a business model for companies such as OPower which provide social information about electricity consumption to around 50 million households, allowing to cut household energy usage by about 2.5%.

Behaviorally informed policy should systematically activate and leverage social norms in their communications and interventions. If the desired outcome behavior is already occurring frequently in the population, this can be easily communicated.

Some behaviors with negative environmental impact figure prominently in peoples' lives (e.g., frequent flying, eating meat every day).

In these cases, communication can focus on dynamic norms, i.e., recent changes of a norm ("over the last two years, 30% of citizens have started to make an effort to reduce their flying behavior").

By making recent changes salient, people can adapt to an emerging social norm, even if it is only shown by a minority¹⁵.

Given that a successful mitigation of climate change requires behavioral change at the societal level, it is moreover important to understand the factors that determine how and why individuals engage in collective climate action such as citizen activism and climate policy support¹⁶.

Individuals who perceive that a collective problem exists are more likely to engage in collective action if they believe that the problem can be successfully tackled by group action (efficacy aspect) and they experience a strong sense of collective identity (social aspect).

Behaviorally informed policy should aim to promote collective climate action by leveraging efficacy and social aspects of collective action.

For instance, local grassroots initiatives could be encouraged to organize into global networks (as achieved by "Fridays for Future") and structurally supported in these efforts.

This would leverage the social aspect by underlining a collective identity, and leverage the efficacy aspect by communicating that individuals can contribute to mitigation at the global level beyond their own local neighborhood.

Practical aspects of climate action.

Even if the reality of climate change is acknowledged, the perceived difficulty of the mitigation challenge can prevent people from taking up concrete climate action.

People may not be aware of the impact of their own behavior, given that concepts such as energy use and carbon emissions are relatively abstract and thus hard to apply in everyday life.

Moreover, the behavioral contribution that each individual can make to climate change mitigation may seem disconnected from the enormous size of the problem. This impression can lead to feelings of helplessness. In the worst case, it may result in reactance or denial when one is confronted with messages about the environmental effects of one's lifestyle.

Behaviorally informed policy should focus on the most efficient climate actions.

Interventions should be focused on a few carefully selected actions that can have a large impact on consumption and emission reduction and should at the same time communicate that, while climate change is indeed one of the biggest challenges mankind has ever faced, joint mitigating actions can have a positive impact.

Communicating and contextualizing the potential effect of high-impact actions will not only guide individuals towards the most efficient behavior change, but will increase motivation to act by increasing perceived efficacy.

While the insights presented so far aim at increasing the motivation of individuals to show sustainable actions, a complementary approach to increasing the frequency of sustainable actions is based on the recent development of choice architecture and nudging¹⁷.

These approaches change the environment in which choices are made in order to increase the probability of a specific outcome, often by increasing the ease with which the desired option can be chosen or the desired behavior can be shown.

The default nudge is one of the most widely used and impactful interventions in this context. Pre-selecting one of the choice options leads to a large increase in the number of times the default option is chosen. For example, setting the default in voluntary purchases of energy contracts to the more expensive "green" energy choice increased green purchases nearly tenfold¹⁸.

Behaviorally informed policy should make sustainable behavior change easy by using targeted default options.

Default options are an interesting complement to the previously discussed motivational strategies because they operate relatively independently of an individual's internal motivations to act, and may thus be especially useful to induce more sustainable behaviors in people without strong environmental preferences (while still leaving individuals who are opposed to the pre-selection option the opportunity to opt out).

However, as nudging strategies are gaining in popularity, diverse criticisms have been put forward, including both the fact that nudging interventions may be perceived as manipulations, and the fact that being exposed to nudging may lead to compensatory rebound effects and to reductions in overt policy support¹⁹.

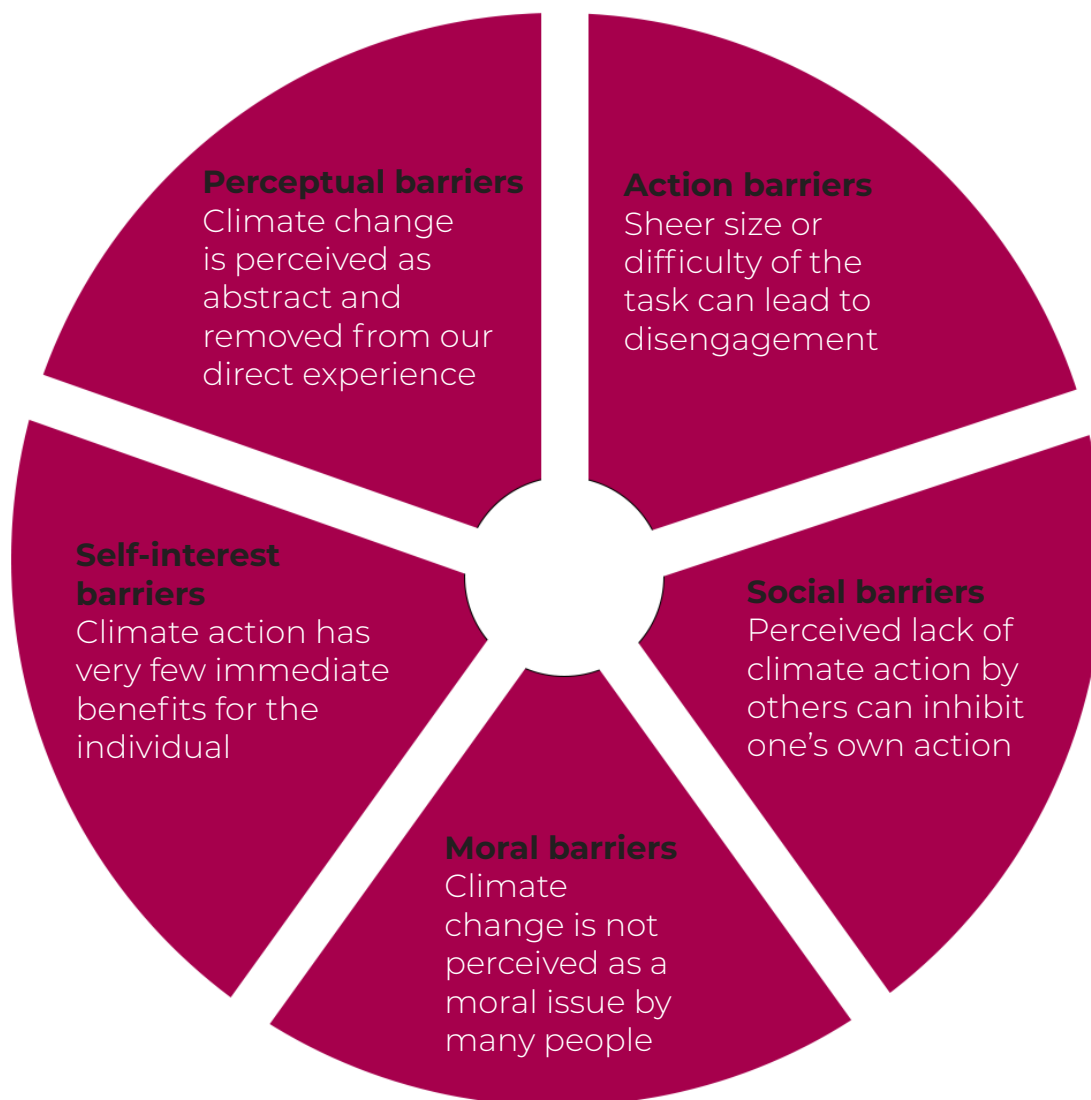


Figure 1: Overview of the different psychological barriers that can impede sustainable behavior.

3. POLICY RECOMMENDATIONS

The following table summarizes the barriers and behavioral levers discussed in this document, provides examples for concrete applications and gives an indication of the empirical confidence in the recommendations, based on whether the recommendation is based on experimental evidence, or whether it has already been implemented in specific contexts in large-scale interventions.

Barrier	Recommendation	Examples	Confidence
Abstract nature of climate change makes it difficult to understand the personal relevance of the issue	Help people understand the impact of climate change on their own life/family/community	Communicate the immediate and local impact of climate change instead of abstract statistics Develop concrete simulations of climate change consequences (e.g., using virtual reality)	Based on correlational and experimental data, more research is needed before large-scale implementation
Concrete climate action has very few immediate benefits for the individual	Emphasize the co-benefits of climate action (health, social, status gains)	Create awards and publicize lists that rank the most sustainable countries, companies, celebrities, citizens Emphasize health gains resulting from more sustainable behavior	Based on correlational data, more research is needed before large-scale implementation
Climate change communication addressing moral aspects targets a restricted value base only	Broaden communications to address a larger spectrum of moral values	Emphasize the need to prevent pollution when addressing a more conservative audience about climate change Reframe climate action as a moral obligation for Christians	Based on experimental data, more research is needed before large-scale implementation

Perceived lack of climate actions by others can inhibit one's own actions	Leverage positive social norms, promote collective climate action	Communicate about the large number of people appreciating and showing climate action Communicate about increases in climate actions by minority groups to leverage dynamic norms	Previously implemented at large scale (e.g., OPower)
Sheer size of the climate challenge can lead to feelings of helplessness	Communicate which behavior changes have the highest potential impact	Publish a top ten list of climate actions ("If you only have time to do one/three/ten things for the climate, do this") Provide information about the joint impact of collective climate action (citizens, industry, governments)	Based on experimental data, more research is needed before large-scale implementation
Not everybody can be convinced that climate change action is a priority that should drastically change our lifestyle (but most people will not be radically opposed to change, neither)	Use choice architecture to make sustainable behavior easy	Make sustainable behavioral choices the default option (e.g., green energy, carbon offsets...) Visualize individual resource consumption in a cognitively non-taxing manner (e.g., color-coded smart meters)	Implemented at large scale multiple times ²⁰

4. CONCLUSIONS

Behavioral sciences allow identifying several barriers which may impede the required behavioral shift towards a more sustainable lifestyle.

At the same time, they allow formulating a number of intervention strategies that can help increase individual motivation to act on climate change and increase sustainable behaviors by overcoming processing limitations, harnessing diverse motivational systems, and facilitating decision-making in concrete choice situations.

These strategies can be adapted and tailored to a range of population segments differing in their pre-existing values, environmental attitudes, and motivations:

- Individuals with strong pro-environmental preferences should already be sensitive to the urgency to act on climate change and will mainly benefit from information about the most efficient actions they can take.
- Individuals who do not yet have strong preferences concerning the necessity to act may best be targeted by communications about moral and social aspects or by changing aspects of the choice architecture.

- Individuals who actively oppose the necessity for pro-environmental behavior change may potentially be receptive to interventions emphasizing personal co-benefits, for example gains in social status.

While some of the recommendations have already been successfully implemented in large-scale interventions, others still need to be evaluated empirically using randomized control trials with sufficiently large sample sizes before being recognized as impactful, scalable policies.

It is important to keep in mind that human behavior is always influenced by contextual factors. Thus, the recommendations put forward here are not general panaceas that will work irrespective of individual (e.g., ideology) or structural (e.g., local governance context) differences.

While this policy brief is an attempt to integrate and synthesize psychological barriers and behavioral levers for climate action, the efficacy of the different recommendations needs to be considered and tested in specific structural and governance contexts.

It is recommended to seek expert advice when planning to design, implement, and evaluate policies based on the recommendations outlined here.

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