– Pre-Analysis Plan –

EU-wide survey to investigate the impact of lacking international cooperation and individual moralisation on climate policy attitudes

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Background and motivation

Collectively shared belief distortions or misperceptions and their implications have gained increasing attention by economists throughout the last decade (Bénabou & Tirole, 2016). Most research has been on behaviour in markets. For example, behavioural finance research has shown that such distortions can lead to financial bubbles and crashes. Collective distortions can arise through narratives, i.e. stories of emotional appeal and varying degrees of truth that spread over time and become persistent (Shiller, 2017). Narratives also play an important role in public policy, but this direction has received relatively little attention so far. A particular question concerns the ramifications on policy beliefs and goal-directed behaviour when underlying narratives are dismantled, and the extent to which this will correct previously induced collective belief distortions.

In this work we analyse the consequences of policy-related belief distortions for the case of climate change, a collective action problem of global scale where policy narratives are pervasive. We do so by surveying 2,000 households in each of the largest 24 EU member states (48,000 households in total). As part of this survey we conduct two experiments: (1) a choice experiment with randomized information treatment to analyse the effect of a climate policy narrative related belief distortions and updates, and (b) an incentivized choice experiment with 50% of the sample to elicit willingness to pay for climate action and how moralisation of attitudes related to the environment and paternalism correspond with actual behaviour.

The narrative we focus on is that the pledge and review mechanisms of the Paris climate agreement will “enable an upward spiral of ambition over time” that ensures its goal can eventually be achieved. This narrative is frequently employed by policy makers and activists, but defies a fundamental weakness of the Paris agreement: the lack of a mechanism to enforce common policy commitment (MacKay et al., 2015). The apparent political motivation behind this narrative is that a policy goal must be perceived as achievable to induce action (Edvardsson & Hansson, 2005). That is, agents – if rational – should only engage in and support action if they believe that dangerous climate change can eventually be prevented. Correspondingly, a broad endorsement of this narrative by voters may have led jurisdictions like the EU to adopt ambitious unilateral policy, avoiding reshuffling problems by largely drawing on technology standards an subsidies regulation (cp. Bushnell et al., 2008).

A core motivation for our work is that this narrative is about to be dismantled. Since the Paris agreement was reached in 2015, global GHG emissions have not declined, but risen steadily. Looking forward, according to model-based analysis by the IPCC (2022), the goals of the Paris agreement might still be achieved. Yet, it becomes increasingly challenging: the gap between projected emissions according to countries' pledges and what is required to be on track for the 2 °C target (let alone 1.5 °C) has become substantial (UNEP, 2022). What is more, considerable concerns exist about the credibility of these pledges (Victor et al., 2022). This suggests that the Paris goal is increasingly out of reach. So far, this knowledge is mostly confined to expert discussions, but before long it can be expected to diffuse widely. Our main interest is thus on how this information will be received by the public. Correspondingly, the research questions are (1) to which extent do individuals update their beliefs when confronted with this "sobering" information, and (2) change their policy attitudes in response.

A specific aspect we consider is the role of moralisation. Climate change is known to be a highly moralised topic (e.g. Wolsko et al., 2016). It is also well known from economic and psychological research that if people moralise an issue ("moralisers"), they tend to disregard new information that stands in contrast with related beliefs (Bénabou & Tirole, 2011; Oeberst & Imhoff, 2023; Van Bavel & Pereira, 2018). In the context of our work, the interest is not in climate change as such, but in attitudes towards policies to address it. Two types of moralisation are relevant in our case: First, environmental moralisation in the sense that people want to reduce their own emissions as much as possible (Jakob et al., 2017). Second, moral reservations against using market-based policies to tackle climate change. People tend to find trading of emissions rights morally repugnant (Leuker et al., 2021; Roth, 2007), and more broadly tend to oppose markets on moral grounds (Sandel, 2012). From the point of view of economic efficiency, resulting moral behaviour attempts to protect a social value at a personal or societal financial cost, respectively (Ockenfels et al., 2020). A different way of putting it used by political scientists is that moralisation reorients behaviour from maximizing gains to adhering to rules (Ryan, 2017), and puts emphasis on the desired outcome, rather than questions about means and achievability (Skitka et al., 2021). These aspects related to moralisation will factor into our analysis.

Our work relates to a growing strand of economic empirical literature at the intersection of climate policy attitudes, motivated belief-updating and misperceptions, as well as moral values and behaviour. Substantial research has been conducted on attitudes related to carbon pricing, for instance focussing on the role of motivated reasoning (Douenne & Fabre, 2022; Druckman & McGrath, 2019), worldviews (Cherry et al., 2017), economic understanding (Kallbekken et al., 2011) and fairness (Sommer et al., 2022). More recently, two large scale cross-country studies have been conducted by the OECD (Dechezleprêtre et al., 2022) and the IMF (Dabla-Norris et al., 2023) covering a variety of these aspects. Finally, there is work on environmental moral behaviour (Jakob et al., 2017; Ockenfels et al., 2020; Welsch, 2020) and on the relation between norms and climate change attitudes employing an experimental setting (Andre et al., 2022).

We expand this literature in at least two key ways. First, we consistently analyse climate policy attitudes from an international cooperation angle. We focus on the "moral tension" in the dynamics of environmental policy as elaborated theoretically by Besley and Persson (2023): moral values may help to speed up local green transition but can jeopardize international cooperation that helps poor countries to mitigate. Related, nudges to reduce (individual) emissions may diminish support for collective action in the form of a carbon tax (Hagmann et al., 2019). To the best of our knowledge, our work is the first large scale survey-based study to investigate this issue empirically. Second, acknowledging the lack of progress on lowering GHG emissions, we provide "sobering" information that challenges the prevailing narrative

that the Paris agreement could work. Some research in this direction by environmental scientist on the effects of commitment failures (Beiser-McGrath & Bernauer, 2019) and "doom and gloom" messages (Ettinger et al., 2021) already exists. However, it does not consider moralisation as an explanation, and findings stand in stark contrast to economic intuition. Related, the used research design does not inform subjects about the true state of the world, but is largely hypothetical[1]. In contrast, we exclusively rely on scientific analysis by the IPCC, designed the provided information in consultation with an IPCC lead author, and adhere to best methodological practice by measuring trust and other beliefs about the provided information (see Haaland et al., 2023).

Finally, our focus is on Europe also because we are convinced that our work is of high policy relevance for EU climate policy making. While the debate around climate change in the EU is not as polarised as in the US, there is evidence that attitudes are nevertheless politicised (Fisher et al., 2022). Moreover, a recent survey by the European Commission (EC 2023) finds that even though 93% of all Europeans think climate change is a big problem, it has fallen to third place in the list of the most serious problems facing the world (after "poverty, hunger and lack of drinking water" and "armed conflicts"). In a similar vein, a survey by the European Investment Bank (EIB 2023) finds that 88% agree to the statement "*we claim to fight climate change, but actually people and businesses are not truly willing to change [...]*". What is more, in the context of delivering the Green Deal, stringent climate policies will be implemented in the next years, and concerns about a "greenlash" are mounting[2]. At the same time, populism is on the rise in Europe. The European Commission's latest strategic foresight report (EC 2023) identifies increasing cracks in social cohesion and threats to democracy as key challenges for the years ahead. Hence, there is a risk that populists parties will instrumentalise the factual lack of international progress by means of a "doom and gloom" narrative, which may entail the claim that "in truth" EU citizens do not support climate action because it will be in vain[3]. Our work could provide important evidence to dismantle such populists' narratives.

Sample

The survey is administered by GfK and cooperating institutes. Participants are drawn from panels that allow for nationally representative samples. Recruitment varies between panels and is predominantly online. The questionnaire must be filled out online on suitable devices (CAWI). The sampling process is as follows: all members between 18 and 74 years of age are eligible for participation, and soft quotas (+/- 20%) for age, gender, and region are applied to ensure appropriate representation. The sample size is 2,000 respondents in each of the EU member states except Cyprus, Luxemburg and Malta. The survey started on August 4, 2023, and we expect to receive the collected data by September 8, 2023. A large set of socio-economic and demographic background information as well as a large suite on psychological and political attitudes and environmental preferences is gathered.

Study design

The aim of the study is to analyse the effect of sobering information and moralisation on climate policy attitudes related to three core policy choices: overall ambition, level of action, and instruments. To that end we design a survey that comprises three parts: In the first part,

[1]For instance, Beiser-McGrath & Bernauer use coal consumption as a proxy for emission reduction.
[2]https://www.reuters.com/sustainability/greenlash-fuels-fears-europes-environmental-ambitions-2023-08-10/
[3]It is worth noting that questions in both the EC and EIB surveys are geared towards eliciting support, and don't ask for e.g. trade-offs. In a way, they thus also fuel a narrative. A notable exception is the question on "true willingness" in the EIB survey, which alludes to a potential pretense when it comes to public support.

we measure moralisation of respondents through stated attitudes and choices in an incentivised experiment. In the second part, we conduct a random control trial information provision experiment to measure the effect of sobering information on the support of climate policy. In the third part, we measure support for carbon markets and specifically the EU Emission Trading Scheme (EU ETS) in light of the previously elicited moralisation and belief updating, and general knowledge about carbon markets. The three parts will be described in more detail below.

Measuring moral values and behaviour: To measure the moralisation of attitudes, we employ the personal moralisation measures developed in social psychology (Skitka et al., 2021). More specifically, we use a simplified version of the two-item form proposed by Skitka[4]; also see Sktika & Morgan (2014). In this approach, rather than defining ex-ante what moral norms or values people may use to evaluate certain behaviours, we ask participants directly whether they consider an issue as moral and judge it accordingly. This way of asking participants has been shown to relate strongly to moralisation characteristics, such as reduced willingness to compromise on an issue (e.g. Ryan, 2014, 2017). In order to differentiate the moralisation measure form alternative explanations, we also measure how important participants find the issue personally. Controlling for this allows us to isolate the pure moralisation of an issue from the attitude direction (for or against) as well as the relevance to a person. In addition, to mitigate a potential influence of response order bias, the order in which the various statements are presented to respondents is randomised. Finally, we pre-test the statements using ChatGPT to emulate whether respondents would likely view the statements as moral (see Dillion et al., 2023).

To measure moral behaviour, for a subset of respondents (50% of the sample) we conduct an incentivised experiment in which we measure moral behaviour in the form of willingness to pay for carbon offsetting and imposing respective choice constraint on others: respondents can take part in a lottery and in case they win choose whether they want to keep the money (50 EUR, PPP adjusted) or donate it for compensating the emissions incurred by the research project. They are further offered the option to make the same choice for other winners, which we interpret as a measure of ideals-projecting paternalism (Ambuehl et al., 2021) related to their environmental moral values. The order in which the two decisions are made is randomised.

Such incentivised donations experiments have also been conducted in previous work. Andre et al. (2022) use a lottery set-up and ask respondents to divide $450 between themselves and a charitable organisation that fights global warming in case they win. Dechezlepretre et al. (2022) also use a lottery set-up in which respondents can win $100, and in case they do can donate to a non-profit organisation that fights deforestation. Our set-up is similar, but differs in two important ways: First, we allow respondents to make choices for other winners (see above). Second, we explain that the overall financial sum was budgeted to compensate the emission of the research project in order to investigate whether environmentalism correlates with paternalism.

Belief and attitude updating through sobering information: In the information provision experiment, respondents in the treatment group receive sobering information on the lack of success of the Paris agreement. Specifically, we inform them that compared to 1990, the global GHG emissions have increased 54% by 2019, presenting a record high. Moreover, we provide a graphical illustration of the projected emissions reduction by the pledges made by the countries that ratified the Paris agreement, highlighting that they reflect merely a third of what is actually necessary to achieve the goals. The graphic is adopted from the latest IPCC

[4] https://lskitka.people.uic.edu/styled-7/styled-15/styled-8/index.html

report. In turn, respondents in the control group receive information and a graphic on the general greenhouse effect. Notably, the length, extent of scientific language and complexity of the graphic are similar across the two groups.

To gauge the impact on climate policy attitudes, we present participants scenarios and ask them to allocate their government's efforts to global, EU, and national climate policies. Each scenario was framed under three externally varied likelihoods: very likely, a 50-50 chance, and highly unlikely. The sequence in which these likelihoods are presented is randomized. Within each likelihood scenario, participants can distribute a total of 100 (effort) points, where 100 represents "maximum effort." This allocation is to be divided among global, EU, and national levels. Moreover, participants are made aware that allocating less than 100 points would direct the remaining effort towards other national policy initiatives like education, healthcare, or national defence programs. We further elicit respondents' initial beliefs about the likelihood of attaining an effective global agreement. In consideration of potential priming effects, 50% of respondents are asked before the effort allocation questions, and the remaining 50% after these questions.

Support for (global) carbon markets, in particular the EU ETS: The specific angle of this study is support for carbon markets when framed as policy to foster international cooperation. We investigate this in two parts. The first part focuses on the international level. We describe three existing international policy initiatives around different policies (phasing out coal, putting a price on emission form fossil fuels, creating a global carbon market) to foster international cooperation. For each, we elicit respondents' belief about the potential success and capacity to reduce emissions. This provides a baseline for the second part, which focuses on the EU Emission Trading System (ETS). We describe a number of strategies through which the EU ETS could reduce emissions outside of the EU and elicit beliefs as to whether these strategies could be effective. Then we provide information about the recent reform of the EU ETS and clarify that it strengthened the role of carbon markets for EU climate policy. Finally, we ask respondents if they support or oppose it.

Expecting knowledge about and interest in carbon markets to be an important factor (besides the moralisation of attitudes related to the use of markets for climate policy, see above), we also indirectly measure interest in the information provided about the global policy initiatives and the EU ETS reform. In addition, we elicit general knowledge about carbon markets by asking both factual (true/false) questions and, again, moral questions, inferring the later from the repugnancy characteristics identified by Leuker et al. (2021). We use ChatGBT for support in both devising the questions and cross-checking if they can be understood by an average EU citizen.

We restrict elicitation of carbon market knowledge to the respondents who do not take part in the incentivised experiment (see above). This is because of contractual constraints: The contract with GfK only allowed us to conduct the incentivised experiment with 50% of the sample; at the same time, the total length of the interview must not exceed 20 minutes. To safely stay within the time limit, we only elicit the carbon market knowledge of the remaining 50%.

Analysis and expected main results

Research Question 1: To which extent does stated moralisation of environmentalist and paternalist attitudes correspond with moral behaviour – i.e. the willingness to pay for carbon offset, and constraining others in the same choice? Does environmental moralisation go along with paternalistic and use-of-markets moralisation?

Hypotheses: A first hypothesis relates to how well stated moralisation of an attitude corresponds to respective measured behaviour. The particular interest arises from the fact

that stated moralisation is a measure typically used by psychologist and political scientists. In this line of research, moral decision making is usually modelled explicitly; see Chorus (2015) for a review of modelling approaches. In contrast, economist tend to focus on measuring behaviour which can be ascribed as moral[5]; see for example Jakob et al. (2017) and Ockenfels et al. (2020). This besg the questions whether individuals who state strong and moralised attitudes also behave in line with it, or if stated attitudes for example just reflect image rather than actual behaviour (cp. Binder & Blankenberg, 2017). A simple null hypothesis is that stated moralisation correlates positively with moral behaviour, in the case of both environmentalism and paternalism. A related hypothesis pertains how the two interact in behaviour. In that regard we hypothesize in line with Ambuehl et al. (2021) that environmental moralisers are "ideal-projecting", i.e. want align others' choices with their own choices.

A second hypothesis relates to a potential correlation between the different types of moralisation of interest here. That is, do people who moralise on the environment also tend to moralise on paternalism and the (non-)use of markets? To the best of our knowledge there is no previous work that analyses this question. However, related work suggests that a relationship might exist. For instance, people who support market mechanisms are also in favour of individualism (Landier & Thesmar, 2022). Conversely, they might oppose paternalism. Moreover, research on political movements (Meyer, 2008) and policy arguments related to the (non-)use of market-based policies (Allcott, 2016; Glaeser, 2004) finds that endorsement of paternalism tends to rest on the conception of other people being ignorant about the true scale of the (environmental) problem and economic incentives to address them, respectively. While this only indicates the mechanisms by which the three dimensions might be linked to each other, in our view this suffices to employ the null hypothesis that a (positive) correlation exists. In this vein, we also hypothesize that a correlation between stated moralisation on paternalism and paternalistic behaviour exist.

Analysis: The first step is to group respondents into "moraliser" and "others" – according to their attitudes on normative statements related to environmentalism, use-of-markets, paternalism, and respective moralisation. The statements are:

- *We as society should collectively reduce our carbon emissions as much as possible.*
- *Governments should utilize markets and competition between firms to tackle climate change.*
- *People should not impose their own views on other people even if they think what the others do is wrong.*

Attitudes towards these statements and their moralisations is measured on 5-point Likert scales. A bipolar scale is used for attitudes (*strongly disagree ... strongly agree*), and a unipolar scale for moralisation (*not at all based on what I think is "right" or "wrong"* ... *completely based on what I think is "right" or "wrong"*).

For each of the three dimensions (statements), we group respondents as follows:

- **Pro-moralisers**: attitude responses 4 & 5 AND moralisation responses 4 & 5
- **Anti-moralisers**: attitude responses 1 & 2 AND moralisation responses 4 & 5
- **Others**: attitude responses 3 AND moralisation responses 1-3

We begin our analysis by estimating a simple OLS model for the decision the respondent takes for herself:

[5]Measuring moral values using the Moral Foundation Questionnaire (MFQ) seems to gain increasing prominence though; see for example Enke (2020) or Andre et al. (2022).

$$WTP_i = \beta_0 + \beta_1' ME_i + \beta_2' MM_i + \beta_3' X_i + \varepsilon_i \,,$$

where, WTP_i represents the willingness to pay for carbon offsetting by respondent i. ME_i and MM_i encompass dummies categorizing the aforementioned moraliser groups in the environmental and use-of-market dimensions, respectively. Vector X_i comprises a set of control variables, and ε_i is a random error term.

Next, we are interested in discerning variations in respondents' willingness-to-pay (WTP) for compensation – and imposing a corresponding choice on others, which we call imposition to pay (ITP). We proceed in two steps: As respondents can opt-out of deciding for others, we first model whether they want to do so or not, that is:

$$\Pr(ITP \neq NA) = \gamma_0 + \gamma_1' MP_i + \gamma_2' X_i + \xi_i \,,$$

where ITP denotes the amount allocated to carbon offsetting specified for others, and MP_i is a dummy for the paternalism dimension. For the sake of a direct interpretation of the coefficients, we specify this model as a linear probability model. For robustness, we also estimate methods designated for modelling binary responses, i.e., a logit and probit model, and compare the marginal effects.

Finally, we estimate ITP for those participants who report a non-missing value in the previous question using OLS:

$$ITP_i = \delta_0 + \delta_1' WTP_i + \delta_2' M_i + \delta_3' WTP_i \times M_i + \delta_4' X_i + \epsilon_{i,} \,.$$

In this specification, we control for the individual contribution WTP_i. As mentioned above we hypothesize a positive correlation, i.e. that respondent make the same choice for others as they do for themselves. Moreover, we incorporate all moralisation categories M_i. We are most interested in how the effect of individual WTP differs across the moraliser groups. Therefore, we interact these two variables. To keep the model tractable, we estimate separate models for each dimension of moralisation (ME, MM, MP).

In the third step we test the second hypothesis, i.e. whether environmental moralisers also tend to be paternalism and non-market moralisers. We do this using a simple OLS model, controlling for the same set of covariates X_i as before.

Research Question 2: How does scientific information that the global Paris climate goal is increasingly out of reach ("sobering information") affect climate policy preferences, and do the effects differ for environmental moralisers?

Hypotheses: Ample experimental research on public good provision games has found that players only cooperate under the condition of reciprocity; see MacKay et al (2015) and the references therein. Taking the lack of progress in achieving the collectively agreed upon Paris goal as an indication for the lack of cooperation (free riding), we hypothesize that respondents in general adjust their support for climate action depending on the following considerations (null hypothesis):

- If they belief cooperation is <u>likely</u> to be attained in the future (by better policies and higher focus on international action), they prefer to shift effort to action at the international level.
- Conversely, if they belief cooperation is <u>unlikely</u> to be attained in the future, they tend to adjust their attitudes by either (a) reducing overall effort or (b) focussing overall effort on the national level.

In contrast, we do not expect adjustments by pro-environmental moralisers, or there may even be a defiance reaction that leads them to increase effort on international level. Moreover, we

hypothesize that they are a priori more likely to belief that international cooperation can be attained (motivated beliefs).

Another aspect we consider is national heterogeneity. Work by Beiser-McGrath & Bernauer (2019) suggests that respondents tend to not adjust their preferences in response to information on lacking commitment, though this may differ depending on their nationality. More specifically, they find that respondents from China are relatively unresponsive to other countries' behaviour compared to US respondents. Hence, we will also investigate differences across nationalities, and to that end develop more refined hypothesis for example by drawing on the global preference study by Falk et al. (2018)[6].

Analysis: For the analysis we make use of the information provision experiment described above. Given the random assignment to treatment and control, we can use the experimental variation in the information provision to assess whether the sobering information changes policy preferences. To do so we apply the following empirical specification:

$$y_{il} = \alpha + \beta_{1l} T_i + \beta'_{2l} X_i + \varepsilon_{il},$$

where y denotes the effort allocated to reducing carbon emissions for level l. T is the treatment indicator. Since the total effort was limited to 100 points across the three levels, (international, EU, and national level), we apply a fractional multinomial logit model, which allows for joint estimation of shares while accounting for their fractional nature. To account for any unallocated effort, we calculate the residual effort as the fourth level of the dependent variable. The estimated β_{1l}s reflect the average treatment effects of the sobering treatment for each level. In order to identify the effect of further variables on the allocated effort for level l and to increase precision of β_1, we include X_i, which is a matrix of control variables. Notably, it comprises measures for the helpfulness and trustworthiness of the provided information.

To distinguish whether environmental moralisers react differently to the treatment, we augment the above equation with the interaction term $T_i * ME_i$. As above, ME_i is the dummy variable for environmental moralisation:

$$y_{il} = \alpha + \beta_{1l} T_i + \beta'_{2l} T_i * ME_i + \beta'_{3l} ME_i + \beta'_{4l} X_i + \varepsilon_{il}.$$

Research Question 3: Is support for the EU-ETS generally higher when its capacity to facilitate international cooperation is highlighted?

Hypotheses: In a straight forward way, we hypothesize that respondents who belief that the various strategies by which the EU ETS could foster cooperation are successful (and that international cooperation is attainable at all), support this policy more strongly.

We further hypothesize that several factors have a moderating effect. More specifically, support should be stronger/weaker by respondents who…

1. …are pro/anti-environmental and pro/anti-market moralisers (see RQ1).
2. …want to allocate most effort on the EU & international/national level (see RQ2).
3. …have more/less knowledge about carbon markets. This is in line with the finding that the acceptance of a carbon tax depends on prior knowledge about the instrument (Maestre-Andrés et al., 2021).

[6] A potential direction would be to look at positive and negative reciprocity distributions, and split countries into low-high reciprocity. For example, a potential hypothesis could be that respondents in countries with a higher level of negative reciprocity will reduce effort more.

4. …believe that a global carbon market can outperform national instruments (fossil fuel phase out, national carbon pricing) in the context of international policy initiatives to foster cooperation.
5. …have more/less trust in the EU. This is in line with the findings by Fairbrother et al. (2019) for fossil fuel taxes. Related, it is well known that citizens of EU member states have varying degrees of trust in and support of the EU as a political entity (Halman et al., 2022).

Analysis: We conduct a simple OLS regression, where the dependent variable is the support of the recent reform of the EU-ETS. In line with the above hypotheses about influencing factors, we include the following independent variables:

1. Dummies for environmental and use-of-market moralisation
2. Belief about the likeliness that that countries around the world will reach an effective global climate agreement to limit global warming to 2°C (5-point Likert scale)
3. Index constructed from the sum of correct answers in true/false carbon market questions
4. Beliefs about different policies being successful for attaining cooperation and their potential to reduce emissions (two items, 5-point Likert scale)
5. Attitudes on trust in EU and how close respondents feel to it (two items, 5-point Likert scale)

Power analysis

To analyse RQ2, we randomly assign participants into a treatment group and a control group so as to estimate the causal effect of sobering information on climate policy attitudes: in the case here the effort allocated to a specific policy level (national, EU and international). To assess the minimum effect (MDE, δ) we can detect, we conduct a power analysis. For that we use the following formula for single-level trials with continuous outcomes (Djimeu & Houndolo, 2016):

$$\delta = (t_1 + t_2)\sigma_y\sqrt{\frac{1}{P(1-P)n}},$$

where t_1 is the t-value corresponding to the desired significance level, t_2 is the t-value corresponding to the desired power, σ_y is the standard deviation of the outcome variable y, P is the proportion of the sample assigned to the treatment group, and n is the total sample size.

We use a standard significance level of α=0.05 and a power of β=0.8, resulting in t_1=1.96 and t_2=0.84. As we randomly split the sample into two groups, P=0.5. The total sample size is n=48,000 (2,000 in 24 countries each).

As we are not aware of similar studies that analyse the effect of sobering information on a continuous outcome variable, we rely on relatable previous work by one of the co-authors (Andor et al., 2018). It surveys German households about the share the government should assign to a range of federal tasks, including environmental issues.[7] The mean share of the budget for environmental purposes amounts to 16.5%, and the standard deviation (σ_y) is 6.74. Using the above formula, the MDE for the entire sample is δ=0.172 percentage points. As we are also interested in the MDE per country, we repeat the calculation with n=2,000 (assuming that σ_y is identical across the countries), which results in δ=0.844 percentage points.

[7] The original (translated) question reads as follows: “Imagine you could decide how the federal expenditures could be allocated for different tasks. Please report the share that should be allocated to the following tasks: Security, education, environment, health, traffic, other.”

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