

# Response letter

## for *International Attitudes Toward Global Policies*

January 24, 2024

Dear reviewers,

thank you for your constructive feedback, which helped us greatly improve the quality of our paper. Before answering point-by-point to each of the comments, let us stress two things. First, due to word limit, the revised version of our paper is shortened. We cut a bit more than 20% of the original manuscript, mainly in the introduction and discussion. We did not cut any result. Second, the modifications we made to the paper following your comments are highlighted in bold below.

As a summary of the many valuable below points, we:

- highlighted that the support for global redistributive policies is context-dependent;
- rewrote the Discussion to better acknowledge the limitations of our survey (in particular, we now write that the support might decay if the policies enter the policy debate);
- clarified that the policy costs are explained to the respondents in the abstract, introduction, and the paragraph on the Global Climate Scheme (GCS);
- added a Supplementary Table A5 regressing the support for the GCS on the comprehension of its effects;
- added an explanatory caption to Table 1;
- added subsections on policy “Prioritization” and “Determinants of support” in the Methods;
- added three relevant references (Ballard-Rosa et al., 2017; Scheve & Stasavage, 2017; Bechtel & Liesch, 2020);
- added Supplementary Tables A6 and A7 on the beliefs underpinning the support for global climate policies;
- added balance analyses (Supplementary Material I) and placebo tests of the effects of each treatment on unrelated outcomes (Supplementary Material J), reported in the Methods subsection “Data quality”;
- improved the description of how we estimate that the GCS would eradicate extreme poverty, in particular by specifying that the 2\$/day poverty line is in PPP while the basic income of \$30/month is expressed in nominal terms.

# 1 Reviewer #1

Thank you for your feedback. Your thoughtful and constructive comments played an instrumental role in improving the quality of our paper. As a result of your guidance and suggestions, the clarity of the manuscript has significantly improved. In the following, we include point-by-point responses to the comments raised in your letter. We greatly appreciate to be challenged with such depth and to get the opportunity to clarify our observations. As for the comments that call for a specific revision, we always find the suggestions useful and we now gladly comply with them.

*This study investigates the level and predictors of public support for the Global Climate Scheme which consists of introducing a global carbon pricing mechanism whose revenues would fund a universal basic income. The analysis of survey data from over 20 countries suggests that the policy finds supermajoritarian support in Europe and majority support in the United States. The main conclusion is that the Global Climate Scheme is preferred by a robust majority across countries and that “the expressed preference is sincere”.*

*1. The results could be very context-dependent because existing conjoint-experimental research finds that this sensitivity is absent when voters can also select tax plans that would benefit the poor (see Ballard-Rosas et al. 2017 JOP) and because the impact of a policy on the richest individuals does not seem to drive preferences in other policy fields (Bechtel and Liesch 2020 POQ).*

Thank you for raising the issue of context-dependency. We agree that it is important to be clear that people’s attitudes are context-dependent (e.g. Fielding & Hornsey, 2016) because of changes of opinion and attitudinal ambivalence (the fact that people hold conflicting values and exhibit different context-dependent social identities). We learn that we have not been clear that we also study some form of context-dependency in the manuscript: we analyse how attitudes towards the Global Climate Scheme (GCS) change once subjects are first prompted to reflect what they might like or dislike about such a policy (subsection “Pros and Cons”).

Thank you also for pointing out the important articles by Ballard-Rosa et al. (2017) and Bechtel and Liesch (2020). We now cite both papers in the Methods subsection on “Conjoint analysis”. We acknowledge that we come to this field from empirical economics, not political science. In our field, there is one important precursor to our work, which is very compatible with our results: Carattini et al. (2019) also studies global carbon pricing and also find that people favor climate policies that are global and equitable. Furthermore, while the GCS benefits the poorest humans, our conjoint analyses already include policies benefiting poor fellow citizens (higher minimum wage, improved public services, higher welfare benefits) and we confirm that these policies are the most popular. We understand Ballard-Rosa et al. (2017) only compare different income tax schedules. Our conjoint analyses allow to compare the relative preference for the GCS and a national redistribution scheme (Figure 8). In Spain and in the U.S., the GCS has no significant effect on the likelihood that a platform is preferred; while in France, Germany and the UK it has a positive effect, larger than the national redistribution scheme.

We also believe our results are compatible with those of Bechtel and Liesch (2020). This excellent conjoint analysis paper shows that American people care about the effects of a generic policy on the poorest fellow citizens about half as much as on their income, and that they care more about losses than gains. Extrapolating from these findings, we can infer that Americans would be indifferent between the status quo and a policy that costs them \$1,000 per year while increasing the income of the poorest by \$5,000; or that a majority would support a policy that doubles the income of the poorest (Americans) and reduce their own income by \$1,000 per year. This is close to what we find in a global context, as the GCS would double the income of the poorest billion humans while costing about \$1,000 per year to the typical American person. Our results do not imply that the support for global redistributive policies is driven by

their impacts on the richest individuals: they might be driven by their effect on climate justice or public services, as all the tax policies we test specify the revenue-use — not mentioning that some previous papers have actually shown aversion for topmost inequality (e.g. Fisman, Kuziemko & Vannutelli, JEEA, 2020).

Realising that we have not been sufficiently clear about those matters, we know explicitly acknowledge that “the **support for the GCS is context-dependent**” in the paragraph about “Pros and Cons”.

*2. The authors highlight that there is no “significant policy proposal” on the table but that could also be a weakness of the study: did individuals know anything about this somewhat complex policy reform? Relatedly, how plausible is it from the perspective of both mass publics and experts that such a global policy would ever materialize?*

Thank you for giving us a chance to explain our research design against the context of existing and hypothesised future climate policy. First, several policies that we test are already ongoing or on the table: e.g. international transfers for climate loss and damages, \$100 billion per year in international transfers to help low-income countries adapt to climate change (Timperley, 2021), and increasing foreign aid. All these policies obtain a similar level of support than options not currently on the agenda like the GCS. Second, we informed respondents about the policies studied, and some of them seem straightforward to understand (e.g. taxing the wealth of millionaires to finance low-income countries). Third, while the most significant policy proposals (in terms of magnitude of international transfers) are currently not on the table, the implausibility from them ever materializing is what prompted us to conduct the research. One way to rephrase our research question is whether the public dislikes global policies. Given that we find public support for such policies, the reason why they are not discussed more in the public debate remains an unresolved question which requires further research.

To reflect these changes in the manuscript, we rewrote the discussion section, specifically acknowledging that “**support for [global climate and redistributive policies] might decay once they are debated**”.

*3. There is a significant disconnect between the claims about support for the global climate scheme and the actual survey item meant to elicit preferences over such a policy. That item merely asks “at which level(s) do you think public policies to tackle climate change need to be put in place?” (lines 80-81). But asking such a broad and amorphous question does not seem to be informative about the level of support for a rather specific, costly, and strongly redistributive global reform. It could be useful to focus more directly on the studies that are clearly focused on the actual policy question.*

We believe there is a misunderstanding here. The question you are referring to is on the geographical level at which climate policies are needed. The Global survey does not only ask this question, but also questions on the support for specific policies such as a global tax on greenhouse gases financing a global basic income. The question is as follows (Supplementary Material C, question H):

*“Imagine the following policy: a global tax on greenhouse gas emissions funding a global basic income. Such a policy would progressively raise the price of fossil fuels (for example, the price of gasoline would increase by [40 cents per gallon] in the first years). Higher prices would encourage people and companies to use less fossil fuels, reducing greenhouse gas emissions. Revenues from the tax would be used to finance a basic income of [\$30] per month to each human adult, thereby lifting the 700 million people who earn less than \$2/day out of extreme poverty. The average [American] person would lose a bit from this policy as they would face [\$130] per month in price increases, which is higher than the [\$30] they would receive.”*

In the complementary survey, the GCS is described in similarly precise terms (Supplemen-

tary Material D, p. 58):

**“Global climate scheme:** At the Paris agreement in 2015, all countries have agreed to contain global warming “well below +2°C”. To limit global warming to this level, **there is a maximum amount of greenhouse gases we can emit globally.**

To meet the climate target, a limited number of permits to emit greenhouse gases can be created globally. Polluting firms would be required to buy permits to cover their emissions. Such a policy would **make fossil fuel companies pay** for their emissions and progressively raise the price of fossil fuels. **Higher prices would encourage people and companies to use less fossil fuels, reducing greenhouse gas emissions.**

In accordance with the principle that each human has an equal right to pollute, the revenues generated by the sale of permits could finance a global basic income. **Each adult in the world would receive \$30 per month**, thereby lifting out of extreme poverty the 700 million people who earn less than \$2/day.

**The typical [American] would lose out financially \$85 per month** (as he or she would face [\$115] per month in price increases, which is higher than the [\$30] they would receive).

The policy could be put in place as soon as countries totaling more than 60% of global emissions agree on it. Countries that would refuse to take part in the policy could face sanctions (like tariffs) from the rest of the World and would be excluded from the basic income.”

So, to us, this description highlights that such a reform would be costly to the Global North and strongly redistributive globally.

4. Similarly, it remains vague how preferences over dividing a carbon budget relates to the research question/claims. Also, one wonders whether these findings about burden-sharing resonate with existing research on this topic. The SI section A.1.2 is quite eclectic about how it portrays existing research on this topic and that review includes “staff discussion notes” papers instead of focusing on high-quality public opinion work published in expert journals. Think of the increasingly large literature on cost aversion and compensation (e.g., Gaikwad et al. 2022 APSR and the literature cited therein).

To us, attitudes towards burden-sharing fall within the scope of attitudes towards global climate or redistributive policies. Section A.1.2 provides a comprehensive review of attitudes on how to share the burden of climate mitigation between countries, and shows that our results align well with the existing literature.

Thank you for pointing out the typo regarding the outlet of the IMF paper by Dabla-Norris et al. (2023), as our bibliography reference failed to mention the institution. We think that this paper should be cited: although it belongs to grey literature, it conducts representative surveys over 28,541 respondents on 28 countries and represents one the most large-scale evidence on the question at stake.

The paper mentioned (Gaikwad et al., 2022) addresses the allocation of carbon tax revenues within a country, while we focus on burden-sharing between countries. Perhaps you were thinking about the really good Gaikwad, Genovese & Tingley (unpublished, 2023)? In short, the latter paper abstracts from the concept of burden-sharing and shows that Americans prefer to decarbonize the U.S. rather than India, and that Indians prefer a slow domestic decarbonization rather than a rapid one led by a foreign entity. This conjoint analysis paper only reports the effects of some features of a (sometimes global) climate policy on the support for it but does not report the base level of support for the policy (therefore, it can hardly be cited to give information on the level of support towards burden-sharing principles). The authors communicated to us the average base level on a 10-point scale: it is 6.0 in the U.S. and 7.2 in India. Combined with the effects in that paper’s Supplementary Section C, these results confirm majority support for international transfers even in the U.S.

5. A key question is whether the predicted levels of support are plausible, especially since the policy would entail considerable redistribution that would require exceptional and maybe even unprecedented levels of international administrative coordination with respect to both the extraction of resources and

*their re-allocation. I currently am missing a strategy to address the argument that the high levels of support reflect the fact that many respondents simply discount the reform as being purely speculative, having a close-to-zero probability of ever materializing, and lacking any clear (personal) costs above and beyond that any costs would fall on the very rich and respondents therefore think they would be net beneficiaries. The importance of (personal) costs has been documented in existing experimental global climate policy research and the findings suggest that a moderate increase in personal costs could lead to sizable shifts in public support even if there is a causally identified preference for allocating costs in line with fairness norms such as the ability-to-pay principle (see Bechtel and Scheve 2013 PNAS). This is in some sense consistent with the descriptive patterns report in Figure 2 and it would be helpful to make this explicit and think about possible explanations. Overall, however, it seems that any study intending to generate predicted levels of support for the types of global and unprecedented policies would have to carefully account for cost sensitivities.*

Many thanks for the substantial discussion. We see two issues here. One is whether respondents implicitly think the examined policies are politically infeasible and that this influences their support. The other is whether respondents realized the policies imply a material loss (personal cost) to them.

Let's start with political feasibility. Granted, that some of the policies we test have low chances of materializing might be a reason why people would overstate their support. To be clear, though, our results indicate that: First, the support is about as high for distant policies like the GCS as for existing ones like the \$100 billion of international transfers for climate finance. Second, our results show that in some European countries like France, vote intention for a progressive candidate may increase by 11 p.p. if they propose the GCS (see Table 2), which may be the most compelling evidence that the support is genuine. Third, the reason why people could overstate their support in case the policy has few chances to occur is likely a social desirability bias. Yet, our list experiment shows no social desirability bias in favor of the GCS (see next response).

On the question of personal costs, we make clear to the respondents that the policy would be costly to them (e.g. \$85 per month for a typical American), and verify that people understand this cost with an incentivized comprehension question (after which we give the correct answer that the typical person in their country would lose, see p. 58 of Supplementary Material).

Our results are in line with a significant body of literature, which shows that support for a climate policy mostly depends on the perceptions that it is fair, effective and in one's interest (e.g. Douenne & Fabre, 2022). Because it is global and corresponds to an equal right to emit for each human, the GCS is by construction effective and fair. On the other hand, it is costly to people in high-income countries. This explains why the policy is less supported in countries (like the U.S.) where costs are higher. This also explains why policies like the global tax on millionaires obtain more support: it involves no direct costs to the respondents (only opportunity costs). Also, note that respondents support only *some degree* of global redistribution: if 90% of the respondents prefer to allocate some positive share of a global wealth tax revenues to low-income countries, the average preferred share for low-income countries is 33%, not 100%. Although this would represent an unprecedented international transfer (of about 0.7% of high-income countries' GDP), this would still be a small amount compared to the magnitude of public transfers that people consent to within a country. If the burden of a wealth tax is concentrated on the top 1%, the significant public support should not come as a surprise. Rather, the conundrum becomes why such a policy is not being implemented: as a frequent argument against a rich tax is that wealthy people would flee to another country, it is totally understandable that the support is high for a *global* wealth tax, which would address this concern.

To reflect these points in the manuscript:

- We stress the unprecedented levels of international coordination required when writing, we added the following sentence in the introduction: *“Yet international negotiations have not led to ambitious global policies”*.
- We make more precise how we tested understanding of the GCS: we added the sentence *“That is, respondents are made aware and we find they understand that the policy will make people in their country poorer.”* in the paragraph on the GCS; we also added this information in a sentence of the abstract, that now reads: *“The GCS is supported by three quarters of Europeans and half of Americans, even as they understand the policy’s cost to them.”*; and we added the following sentence in the introduction: *“In the wording of the question, respondents are made aware of the cost to themselves of such global redistribution”*.
- We have also added a **Supplementary Table A5** that regresses the support for the GCS on the understanding that the policy is costly to people in the respondents’ country. The effect is nil in the U.S. and positive (but barely significant) in Europe. Close to zero effects suggest that all respondents are aware that the policy is costly (as we give the correct answer after testing their comprehension) so that their support is all affected in the same way. Small positive effects suggest a positive correlation between attentiveness to the survey and support for the GCS.

6. *This is related to the potential role of the list experiment as an attempt to address social desirability concerns. This problem would be particularly relevant if a policy is highly ethically sensitive or very politicized. But the main concern with the current study would be about the lack of a clear and somewhat attributable cost component. Also, Table 1 does not provide any information about what is being reported here and how the quantities have been estimated which is inconsistent with accepting transparent reporting standards. It is also somewhat misleading to claim that any differences here would indicate (through the wording selected for this table) that these reflect social desirability bias. There could be many alternative explanations such as interaction effects between the proposed alternatives, e.g., beliefs about the political and economic consequences of pursuing multiple policies simultaneously that are unrelated to social desirability.*

For the concern about cost of each policy, see our response to the previous comment.

Thank you for pointing out that the Table deserves an explanatory caption. We added the following sentence to the caption of Table 1: **“The tacit support for the GCS is estimated by regressing the number of supported policies on the presence of the GCS in the list of policies. The social desirability is estimated as the difference between the tacit and stated support, and it is not significantly different from zero even at a 20% threshold (see Methods).”**

To clarify, while list experiments are commonly used to measure social desirability bias (e.g. Kuklinski et al., JoP, 1997), the question does not specify whether the policies of the list would be implemented or not, let alone simultaneously. That the support for some policy in the list might spill over to the support for the GCS has no consequence on the result of the list experiment, as the other policies are present in the lists of both branches. Finally, the results from our first conjoint analyses show no interaction effects between the policies present in the list.

7. *It is not obvious how deviating from the standard conjoint design (lines 239-244) by adding the points component to assess a selection of previously shown profiles improves over existing work. To be clear, there could be a good reason for this design, but one would have to make that reason explicit. Moreover, these results again show that taxing the rich is the overriding concern. Since this finding conflicts with what we know about tax policy preferences (at least in the US, see Ballard et al. 2016 JOP; Scheve/Stasavage 2022 CPS), one would have to acknowledge this discrepancy which raises questions about the validity of the findings. One could begin exploring this issue by analyzing the results for*

*the US separately although there are obvious limits to what can be realized within the current design framework due to comparability issues.*

In our view, the question on the prioritization of policies is not a conjoint analysis. The prioritization allows inferring individual-level preferences for one policy over another, while a conjoint analysis only allows inferring individual-level preferences for one platform over another or collective-level preferences for one policy over another. Also, by comparing platforms, conjoint analyses may be subject to interaction effects between policies of a platform (which can be seen as complementary, substitute, or antagonistic) while the prioritization frames the policies as independent. That being said, we agree that both methods yield similar results. We used both to get more reliable results but we are ready to drop the prioritization from the main text if needed.

Ballard-Rosa, Martin & Scheve (JoP, 2017) indicates that the marginal income tax rates that maximize public support among Americans are lower than or approximately equal to comparable existing rates. However, the authors acknowledge that “support for higher rates might be more evident with more concrete consequences for valued public services or with the provision of greater information about existing rates”. In our case, we always provide information where the additional tax would be spent, and this may explain the higher support. As for Scheve & Stasavage (2022) – which we now cite, this paper does not provide survey evidence. As we now write on Supplementary Material (p. 26), *“Scheve & Stasavage (2017) discuss three explanations for why we do not observe more wealth redistribution: that other issues are more important to citizens, that citizens do not support wealth redistribution, and that decisions are not taken democratically.”* The first and third explanations are compatible with our results: on the one hand, policies such as a higher minimum wage or improved public services are generally seen as more important as a wealth tax; on the other hand, taxing the rich may be hindered by tax dodging and the lack of tax cooperation between countries, and given the electoral system, the majority may not have the final word in countries like France or the U.S. The second explanation does not seem to hold: previous surveys also find that majorities support redistribution, even in the U.S. For example, ISSP (2019) finds that in each of the 29 surveyed countries, a majority agrees that “It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes”, with 70% agreement and 14% disagreement overall.

We note that the reader can find the results for the U.S. in Supplementary Figure A29. We see that wealth taxes rank high in the prioritization of policies, right after funding affordable housing, student loan forgiveness and universal childcare (not mentioning that wealth taxes would be complementary to these policies).

To explain to the readers why we include a prioritization question, we have added a subsection “Prioritization” in the Methods, which reads: *“The prioritization (Question 58, Supplementary Figures A29 and A30) allows inferring individual-level preferences for one policy over another. This slightly differs from a conjoint analysis, which only allows inferring individual-level preferences for one platform over another or collective-level preferences for one policy over another. Also, by comparing platforms, conjoint analyses may be subject to interaction effects between policies of a platform (which can be seen as complementary, substitute, or antagonistic) while the prioritization frames the policies as independent.”*

8. There is also the issue of effectiveness and financing portion of such a global policy scheme. How plausible is it that taxing the richest would generate sufficient revenue? Moreover, one would want to know more about the mechanisms that explain mass preferences. For example, to what extent is it those who care strongly about addressing global warming who support drastic reforms?

Capping and pricing carbon emissions is widely seen as an effective and proven solution to reduce carbon emissions, as exemplified by the EU emissions trading system and the academic

literature (e.g. Stern & Stiglitz, 2017; van den Bergh et al., 2020). The estimation of the global basic income that the GCS would finance is explained in the text box: “Using the price and emissions trajectories from the Stern-Stiglitz report, and in particular a carbon price of 90tCO<sub>2</sub> in 2030, we estimate that the basic income would amount to \$30 per month for every human over the age of 15 (see details in Supplementary Section E)”.

Thank you for suggesting to study the beliefs surrounding the support for the GCS. We have added regression tables analysing the attitudinal correlates of the support for a global GHG tax and dividend policy (**Supplementary Tables A6 and A7**). These tables show that an index of caring about global warming is significantly correlated with the support in most countries, with a magnitude almost as high as trust in the government or believing that climate policies would be effective in reducing emissions. To highlight these new results, we have added a subsection “Determinants of support” in the Methods, which reads: “**Supplementary Section F examines the sociodemographic determinants of support for the GCS as well as the beliefs correlated with the support for a global tax on GHG financing a global basic income. The strongest correlates are political leaning, trust in the government and perceptions that the policy is effective at reducing emissions or in one’s self-interest.**”

9. *The study connects a wide range of policy fields (tax policy, global climate action, novel decision-making bodies, foreign aid, ...) and this renders the paper difficult to digest and the main contribution appears (unnecessarily?) somewhat superficial.*

We now realize that the wide coverage of the paper and its large number of results render it difficult to digest. Still, we tend to think that the overarching result that majorities support global redistribution is better proven if we present all results pertaining to these topics at once. We hope the numerous changes we made following your comments make our paper clearer.

10. *Is all the material presented sufficiently original given that Figure 1 is taken from an NBER working paper? Also, I am wondering whether the referencing is correct since NBER working paper 1714 is from 1985 and on “Does Deductibility Influence Local Taxation”. Instead, Figure 1 seems to come from the “OECD Economics Department Working Paper, 1714.” The figure has also been used in an 2022 op-ed, see: <https://cepr.org/voxeu/columns/fighting-climate-change-international-attitudes-toward-climate-policies>*

Thank you for pointing out that the number 1714 mistakenly referred to another working paper series of that paper. We note that Figure 1 does not appear in the NBER nor in the OECD working papers. It does not appear either in the VoxEU article (you have probably confused Figure 1 with the figure on *national* climate policies presented on VoxEU). We acknowledge that Figure 1 appears in the appendix of the version of Dechezleprêtre et al. (2022) on the website of Adrien Fabre (and that figure is never commented in that paper). If it is important that this Figure be not reproduced, we can make sure that it is not present in the final publication (which should come out in the *American Economic Review*, given a favorable R&R decision).

11. *Overall, the study and the survey design remains opaque at times. For example, the survey structure seems to have included so many conditions and skip-/assignment logics that it is hard to make sense of the results in terms of experimental conditions and potential order effects. It is also unclear how the Figure A8 results should be interpreted given that it includes a range of policy reforms across multiple issue areas.*

Thank you for pointing out that the survey design remained opaque. We made our best to improve the description of the design in the revised version. In particular, we added in Supplementary Material D that “**Each treatment randomization is independent.**” We also added balance analyses (**Supplementary Material I**) and placebo tests of the effects of each treatment



on unrelated outcomes (**Supplementary Material J**). They confirm that the randomization was satisfactory, as our branches are balanced and there is no significant effect in the placebo tests. In the Data quality paragraph, we now write: **“Supplementary Material I shows that the treatment branches are balanced. Supplementary Material J runs placebo tests of the effects of each treatment on unrelated outcomes. We do not find effects of earlier treatments on unrelated outcomes arriving later in the survey.”** The survey structure is presented with schemas in Supplementary Section D.

Figure A8 is a conjoint analysis that mimick plausible choices between two platforms of progressive candidates (stemming from different left or center-left parties in Europe, or different candidates at a U.S. democratic party’s primary). The goal of this conjoint design is precisely to assess how global redistribution compares to other issues like national climate or social policies.

*12. Lastly, the title could be more informative about the content of the study. Also, it would be useful to convey the key finding or relationship that is investigated in the study in the title.*

Thank you for this suggestion. We are willing to consider changing the title to, e.g. “Global redistributive and climate policies are genuinely supported by majorities worldwide”. We thought that a more neutral title would be preferable but are open on this question and will consult the editor.

## 2 Reviewer #2

*The paper is in many ways a fun and interesting read, but my sense is that it doesn't reach the general interest bar of Nature Sustainability. A main reason behind me reaching that conclusion is that the policies discussed in the papers are generally formulated in very abstract terms. In the demand for redistribution literature one generally observes high agreement to general statements about the importance of things like increased equality and environmental sustainability. However, when policies become more concrete, and when it becomes clear who will actually be impacted, there is generally much less support. There are also often treatment effects from e.g. information present in the abstract, but not for concrete policies. For this reason, the generalizability of findings similar to the ones presented here are limited. This does, in itself, not preclude the paper from being published, but it diminishes its external validity significantly.*

Thank you very much for finding our research interesting and the perceptive comments. We agree that we were too immodest about the generalizability of the findings in the previous version and agree that we here provide one bit of scientific evidence that global policies could be more popular than thought.

We see two major issues here: one whether our policies are sufficiently concrete to be understood by subjects in their economic implications (including to themselves) and one on whether our findings generalize in an appropriate way so to make our study relevant enough to public policy.

First, on whether the policies are concrete enough, we confess that we thought we had formulated the questions in concrete terms and with the cost implications on subjects properly spelled out. To focus on the main policy examined in our study, the wording for the Global Climate Scheme in the questionnaire includes: “**Global climate scheme:** Such a policy would (...) progressively raise the price of fossil fuels (...) **The typical [American] would lose out financially [\$85] per month** (as he or she would face [\$115] per month in price increases, which is higher than the [\$30] they would receive).” (p. 58 of Supplementary Material).

As we present respondents with the loss incurred by people in their country, we do not understand how this description is not a concrete policy – as far as survey design goes, at least. (What is more, a variant of the GCS has been discussed in international climate negotiations as soon as 1990, as we detail in Appendix A.2.1). Perhaps you would have liked that our treatments relate to a more attainable policy (presumably the global millionaire tax). To explain further the focus on the GCs, we hypothesized that it would be less popular than a global millionaire tax, given that it would come with a financial cost for most respondents. Therefore, if the support for a costly policy like the GCS was found to be genuine using our experiments, this result could reasonably be extended to more consensual policies like the millionaire tax.

Second, we very much understand the concern that support for global redistributive policies may be lower if they were becoming more discussed in policy circles and the general public, that is they “generalize” beyond surveys of current attitudes to other fora in which they are “tested”. In a sense, we cannot test more real-worldly fora until such policies enter the public debate, and arguably, we cannot test this better than in our Section Pros and Cons. We believe that we used all the methods available to us survey designers to test whether support for global redistributive policies is genuine. These included a list experiment, showing that the support for the GCS does not stem from a social desirability norm; a real-stake petition, showing that majorities are willing to support the GCS knowing that the results will be sent to their head of state's office; and conjoint analyses, revealing that a progressive candidate would not significantly lose voting share by endorsing the GCS in any country, and may even gain (up to 11 p.p.) in voting intention in some countries.

Note that we see this emphasis on probing the unexpected high support for the global policies by all these methods as a contribution of the paper – it is typically absent from major survey studies on environmental policy such as those which find moderate to high support for national carbon taxes and clean energy spending (e.g. Kotchen et al., 2017; Dechezleprêtre et

al., 2022). What is more, we see our contribution as a modest indication that such policies may be supported once they enter the public debate, and this would be the first step to test whether attitudes will change once global redistribution is debated.

(As an aside, we wondered whether the critique of insufficient “generalizability” was that our findings do not generalize to similar policies when eliciting support for them. For example, we expect strong majority support in a country such as the Netherlands for a global tax on top incomes (say, over \$1 million per year) to finance vaccination campaigns in low-income countries or UN agencies like the World Food Program, even though that specific country or this specific policy were not tested. Yet, we believe that is not the sense in which you worry about “generalizability”).

To improve our presentation regarding these two major points, we made the following changes to the manuscript – noting that the word limit of articles in Nature Sustainability forces us to describe justifications of the design in the Appendices (we know this is rather unusual for social science):

- We have rewritten a passage describing how concrete we are on describing the main policy, the Global Climate Scheme, which now reads (additions in bold): *“We present to respondents a detailed description of the GCS and explain its distributive effects, including specific amounts at stake (as specified in the box below [which details the calculation of the per capita sums involved] and **Supplementary Section D**). Furthermore, we assess respondents’ understanding of the GCS with incentivized questions to test their comprehension of the expected financial outcome for typical individuals in their country (loss) and the poorest individuals globally (gain), followed by the provision of correct answer. **That is, respondents are made aware and we find they understand that the policy will make people in their country poorer.**”*
- Second, we have completely rewritten the discussion – which even if it needs to be very brief due to the word limit acknowledges better the limitations of our approach. It now reads: *“We provide some cautious evidence that certain global climate and redistribution policies may be popular in the Global North. We find no evidence for insincerity or underestimation of fellow citizens’ support as potential explanations for the scarcity of global policies in the public debate, though support for them might decay once they are debated. New hypotheses could explain the seeming inconsistency of the high support for global policies with their peripheral appearance in the policy sphere: First, policymakers may be unaware that global policies are popular. Second, policymakers may believe that global redistribution is politically infeasible in some key countries. Third, with political discourse focused on the national level, shaped by media and elections, national framing may suppress universalistic values.”*
- To reflect these changes in the abstract, we add some words that make clear we merely provide evidence to the claim that such policies may be supported and we point out that costs have been made salient and seem to be understood by our subjects. We also add to the introduction that *“in the wording of the question, subjects are made aware of the cost to themselves of such global redistribution”*.

### 3 Reviewer #3

*I'm not an expert in several of the disciplines relevant to this paper (namely, quantitative social science and political science involving surveys). I defer to other experts on whether the methods here are correct, including preregistration, etc.*

*I also partly defer re the paper's novelty, but if the work here has not already been done elsewhere, then it seems of sufficient novelty to warrant publication in Nature Sustainability.*

*I advocate for a revise and resubmit based on what I am knowledgeable about, as my impression is that this article provides useful and important new knowledge – with the proviso that the methods are approved by other reviewers, and that other reviewers identify no good reason to doubt it is above the minimum bar of novelty. From a political point of view, it is important to know how many people say they would support different policies, including the GCS policy that is one of the authors' focal points, and how robust those responses appear to be. From a wellbeing, equity, and poverty alleviation point of view, the authors' numbers check out regarding something on the order of \$30/person/month in global carbon revenue would be generated with the magnitude of carbon pricing they consider, which could have important poverty alleviation implications if invested in pro-poverty alleviation ways.*

Thank you for your positive feedback. Your insightful comments helped improving the quality of our paper. As a result of your guidance and questions, the clarity of the manuscript has significantly improved. We hope that the new version addresses all your comments to your satisfaction.

*At the same time, there were a few questions I had that seemed important to clarify in the text – some important issues are:*

*1. Do the authors' poverty calculations tacitly assume that the global poor do not bear any of the costs from large carbon pricing schemes such as GCS, and somehow only receive benefits via the equal per capita distribution of the revenues? If so, this might appear to some readers to be a complication for their poverty calculations, because realistically the poor will bear some of the mitigation costs – instead, the correct focus for poverty calculations would be the net benefit, ie for a representative individual below the poverty line, we need to know that individual's net benefit = the carbon dividend they receive minus the additional mitigation cost they bear from the carbon pricing scheme (due to decreased economic growth affecting them, higher fuel and other costs of goods, etc). In other words, if the carbon dividend for those below the poverty line is \$30 per person, we then need to subtract from that amount the increased costs for those individuals from higher priced energy, goods, foregone wages etc in order to know how much better off they are on balance under the carbon pricing scheme. Without anticipating this issue, a skeptical reader might worry that these costs turn out to be a high percentage of the benefits from the carbon dividend, thus undermining the reported poverty alleviation benefits.*

*If the authors have already accounted for mitigation cost in their poverty alleviation calculations, they should state this and briefly explain this in more detail in the text. Currently, the authors seem to say only that "The 700 million people with less than \$2/day would be lifted out of extreme poverty, and fossil fuel price increases would cost the typical person in their country a specified amount (see Supplementary Section D)." However, supplementary Section D does not explain anything relevant to this issue (as far as I see), but rather simply explains how different survey respondents in rich countries are told that their own consumption will be decreased by additional mitigation cost in their own rich country.*

*If I've not misunderstood the situation, and the authors have in fact not accounted for the mitigation cost burden for the poor, perhaps a solution is to cite a paper that quantifies that the net benefits will be large for those at the bottom of the income distribution from a scheme like GCS, and thus that the net benefits are large as the benefits for the poorest greatly exceed the mitigation costs. For one specific set of results that does this, in a paper the authors already cite, see Supplementary Figure 4 (especially panel C) of Budolfson et al "Climate action with revenue recycling has benefits for poverty, inequality and well-being".*

Thank you for highlighting that we were not giving enough information to make our claims fully understood.

The method to compute the net gain and the PPP adjustment is described in Supplementary Section E (referred to in the sentence preceding the one you cite). However, we did not report the net gain estimation for someone living in extreme poverty: we replaced footnote 10 in Supplementary Material E by the following:

**“The average carbon footprint of Sub-Saharan Africa is 0.75tCO<sub>2</sub> per capita (World Bank), and it is even lower for people living in extreme poverty, under one tenth of the world average of about 5tCO<sub>2</sub> per capita (Chancel & Piketty, 2015). Under a GCS with a cash transfer of \$30 per person, if one’s emission is one tenth of the world average, their net gain would be \$27 per month in nominal terms. In regions with extreme poverty like Sub-Saharan Africa (excluding high-income countries), the conversion factor from Market Exchange Rate to Purchasing Power Parity (PPP) is 2.4 (computed as the ratio of the World Bank series relating the GDP per capita of Sub-Saharan Africa in PPP and nominal). Therefore, the net gain for the extreme poor is \$65 per month (or \$2.13 a day) in PPP, enough to lift them out of extreme poverty.”** Indeed, the extreme poverty line is defined as \$2.15 a day in PPP.

Admittedly, the net gain could be lower due to inflation or general equilibrium effects. However, increase in food prices would likely be temporary (the time that supply adjusts to a higher demand) and increased investment capacity of the poorest humans would actually foster growth in these regions rather than reduce GDP compared to a business as usual (BAU) scenario (note that there is no international transfers in a BAU scenario).

Thank you for the reference of the Appendix of Budolfson et al. (2021). This paper finds a per capita dividend in the same order of magnitude as ours, at \$19 per month. Furthermore, once we account for the PPP adjustment, the effect we find on extreme poverty is in line with the calculations of Budolfson et al. (2021).

*2. A further issue is that the authors could be more clear about how many people they claim would be lifted out of poverty by their central GCS scenario. Here is a simple way of explaining one reason why this is important and involves a further complication: even if we ignore the issue in the previous comment and thus focus only on the per capita carbon dividend, by the authors’ own lights the carbon dividend is only \$1/day (= \$30/month). So, if we want to know how many people will be lifted out of poverty, where that means living on more than \$2/day, it is not obvious how many people that would be if all we know is that every person will get an additional \$1/day? (It depends on how many of the poorest people are close enough to the \$2/day line that the extra amount puts them over that threshold. In addition, this illustrates the importance of the issue in the previous comment, since if the net benefit for each person in poverty is less than \$1/day, this will also effect how many people are raised for the first time above the \$2/day threshold.) The authors’ seem to assert without further analysis that “The 700 million people with less than \$2/day would be lifted out of extreme poverty”. (see textbox – note that this quote from the authors most naturally is taken to be saying that \*everyone in the world\* would be lifted out of extreme poverty, but it is unclear why we should be convinced that is so for the reasons just given.)*

*The data underlying the Budolfson et al paper referenced above would answer these questions, but for some reason their paper does not seem to have reported those specific numbers anywhere (ie it does not specifically report what % of those below \$2/day would be lifted above \$2/day in a GCS-like scenario). Perhaps these numbers are available from another published paper, or perhaps Budolfson et al would be willing to provide them if useful.*

We confirm that everyone in the world would be lifted out of extreme poverty if the GCS was successfully implemented (i.e. if every human received the basic income). The confusion stems from the PPP adjustment, which is only mentioned in a footnote in Supplementary Section E that you may have missed. We now mention this PPP adjustment more prominently in

the text as we added it in the box describing the GCS, which now includes the following: “The 700 million people with less than **\$2/day [in Purchasing Power Parity]** would be lifted out of extreme poverty”.

3. *As a side-note, perhaps worth somehow bringing out the subtlety of this a bit: if we change the world so that everyone who was previously living on less than \$2/day is now living on \$2.50/day, it is not clear that we have really ended extreme poverty (as the \$2/day threshold does not mark a deeply precise and dramatic distinction in quality of life)?*

This is a fair point. We used the common definition of extreme poverty by the World Bank, which is necessarily arbitrary. We acknowledge that the GCS would not eradicate poverty (only extreme poverty defined at the \$2/day threshold). Still, we note that the GCS would benefit the global poor, defined as anyone with a carbon footprint lower than the (ex post) world average.

4. *Within Fig 1 and Supplementary Information Fig S1, the authors say that the GCS scenario divides a 2deg global carbon budget into “tradable country shares”. Can the authors explain explicitly how these “country shares” are determined and thus how this is equivalent to the GCS scenario described in the main text (since the text does not otherwise refer to “country shares” as far as I can see). Eg is each country’s share of the total global permits simply that country’s % of global population? Simply adding that information would be sufficient (if that is correct) – but this isn’t completely clear from the text.*

As shown in Supplementary Section C, the first question on the global emissions trading scheme did not specify how country shares would be allocated between countries. This was meant to be implicitly conveyed by the sentence “Following the support for the global quota, respondents are asked about their preferences for dividing the carbon budget among countries”, but we acknowledge that this may not have been clear. We added some words to clarify this earlier in the text. The passage on the global quota now reads:

“These policies include a global democratic assembly on climate change, a global tax on millionaires to finance low-income countries contingent on their climate action, and a global carbon budget of +2°C divided among countries based on tradable shares (or “global quota”), **with the allocation of country shares unspecified.**”

5. *The figures in the main text say that “The numbers represent the percentage of somewhat or strong support, after excluding indifferent answers.” Is it a strong custom to report results in this way in this kind of context? It seemed odd to me, as it seemed to inflate the levels of support. (It is also a little opaque to the reader given it is the only way of reporting things in the main text, given that an unknown and arbitrarily large % of the population could be indifferent – eg if 99% are indifferent, and the remaining 1% are all in favor, that would be reported as 100% in favor?).*

*I defer to the customary norms of how to report things if there is a strong customary norm in favor of reporting the data in the way the authors have. Otherwise I’d prefer the absolute % as reported in SI A3. (The authors could also consider reporting both numbers in the main text together, with the coloring based on one metric, but perhaps add the other in parentheses, eg a question that has a relative % of 84 and absolute % of 64 could be reported as “84 (64)”.)*

It seems to us that there is no customary norm on the matter. We share the opposite perspective that putting the emphasis on absolute levels would downplay the support, as an expedient reader might assume that all those who do not support actually oppose the policy. Displaying the absolute level of opposition may also be an interesting alternative. In any case, it is important to report both the absolute and relative levels of support in separate figures and to do it at least for one policy in the main text, so that the readers get a sense of the share of *indifferent* answers. This is what we do with Figures A3 and A25, and as we write “the global quota obtains 64% absolute support and 84% relative support”. There was only one other policy (loss and

damages compensation) for which we reported the relative level of support, but we no longer report it due to length constraint.

6. *A small issue: I thought GCS should not be described as a “Climate Club” (see textbox pg 8), as in the literature a climate club typically refers to a proper subset of nations that coordinate action together either to benefit themselves directly in some way, or to indirectly benefit themselves by getting other nations to deepen their mitigation efforts? (I don’t think this is anything to worry about in the survey, just could come across as a bit of a distracting misnomer.)*

To us, the GCS fits with the definition of a climate club: carbon pricing within the club and carbon tariffs at its borders. If there is a misnomer, it would rather be in the term “global” as the GCS may only be “international”, i.e. not encompassing all countries. It is too late to change the name used in the questionnaire though.

7. *Perhaps in the main text the authors should more explicitly situate their contribution relative to Carattini, S., Kallbekken, S. & Orlov, A. How to win public support for a global carbon tax. Nature 565, 289–291 (2019). This doesn’t require any big reframing or revisions, but perhaps just a sentence or two?*

In the literature review (Supplementary Section A.1.1), we write that “Carattini et al. (2019) test the support for six variants of a global carbon tax on samples in five countries, representative along gender and age. For a given variant, the sample size is about 167 respondents per country”. Implicitly, our contribution relative to Carattini et al. (2019) is to have large-scale samples, representative along more dimensions than just gender and age (also income, diploma, etc.), to test an emissions trading system (involving a cap on carbon emissions) rather than a tax, and to assess whether the support is genuine. Because we already exceed the word limit, we did not make our relative contribution more explicit in the main text.

8. *I thought for a broad audience it could be explained a little more explicitly what a “real-stake petition” is, and same for the other terms in this key sentence: “By employing a list experiment, a real-stake petition, and conjoint analyses, our study indicates genuine and robust support for the GCS among respondents. For example, the conjoint analyses provide evidence that political parties would not lose vote intention by endorsing the GCS.” Explain and connect the dots more explicitly for a broad audience about what these things mean, and how they imply the conclusions the authors claim.*

Thank you for pointing out passages in the text that are not clear to a broad audience. Because we had to significantly shorten our article, we dropped these sentences. We hope our introduction is now fully understandable by a broad audience.

9. *Regarding why politicians do not advocate GCS, the authors say “we hypothesized pluralistic ignorance, i.e. that the public and policymakers mistakenly perceive the GCS as unpopular”. I thought a different approach might be for the authors in this article to be more agnostic about the explanation absent much deeper political science analysis, while noting that there are several plausible explanations, including this one? (It seems to require much more argument to advance the authors’ explanation, which is not the focus of the paper here.) Eg a different explanation is that politicians are focused on marginal voters who might be indifferent in the majority, but in some cases would see support of GCS as a reason to veto the candidate whereas failing to support GCS as a main plank in their platform is not seen as a reason not to support the candidate. Other explanations are possible.*

We should perhaps clarify in this passage of the paper that pluralistic ignorance was just one of the pre-registered hypotheses that may have explained the absence of global carbon pricing from the public debate.

We test other hypotheses throughout the survey (low stated support, lack of sincerity in

stated support, conflicting core values), including your hypothesis that the GCS would not bring electoral gain to a candidate. We reject the latter hypothesis with our conjoint analyses.

*10. This doesn't necessarily require any changes, but wanted to note that the authors say: "A global quota with equal per capita emission rights produces the same distributional outcomes as a global carbon tax that funds a global basic income." In theory yes, but what about in practice? Some might think that these differ in attractiveness in reality, perhaps due to real-world complications of the sort that are the focus of political economy, administrative feasibility, etc. (Eg if experts were asked the same survey questions, they might differ in their support for each based on these considerations.)*

The cited sentence is meant to introduce the two factors that explain the different levels of support between the global quota and the carbon tax funding a global basic income: framing and difference in the policy properties. Admittedly, we only cited the difference in effectiveness as this is the most prominent difference between a quota (where emissions are fixed) and a tax (where they are uncertain).

We reworded "produces the same distributional outcomes" into "**should produce (...)**" and we changed "citizens may find a quota more effective than a tax to reduce emissions" into: "**citizens may prefer a quota, perhaps because they find it more effective than a tax to reduce emissions**", acknowledging that other potential differences in the perceived features of both policies might play a role.

*Thanks to the authors for this excellent contribution.*

Thank you again to all reviewers for your very constructive comments.