

Supplemental material for Recurrent carbon labels induce bipartisan effects in environmental choices under risk

Zahra Rahmani Azad<sup>1</sup>, Doron Cohen<sup>1,2</sup>, & Ulf J.J. Hahnel<sup>1,3</sup>

<sup>1</sup> Faculty of Psychology, University of Basel

<sup>2</sup> Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, US.

<sup>3</sup> Swiss Center for Affective Sciences, University of Geneva, Switzerland

Data and Analysis Scripts can be found here: <https://osf.io/e78da/>.

Author Note

Correspondence concerning this article should be addressed to Zahra Rahmani Azad, Department Psychology, University of Basel, Missionsstrasse 62A, 4056 Basel, Switzerland. E-mail: [zahra.rahmani@unibas.ch](mailto:zahra.rahmani@unibas.ch)

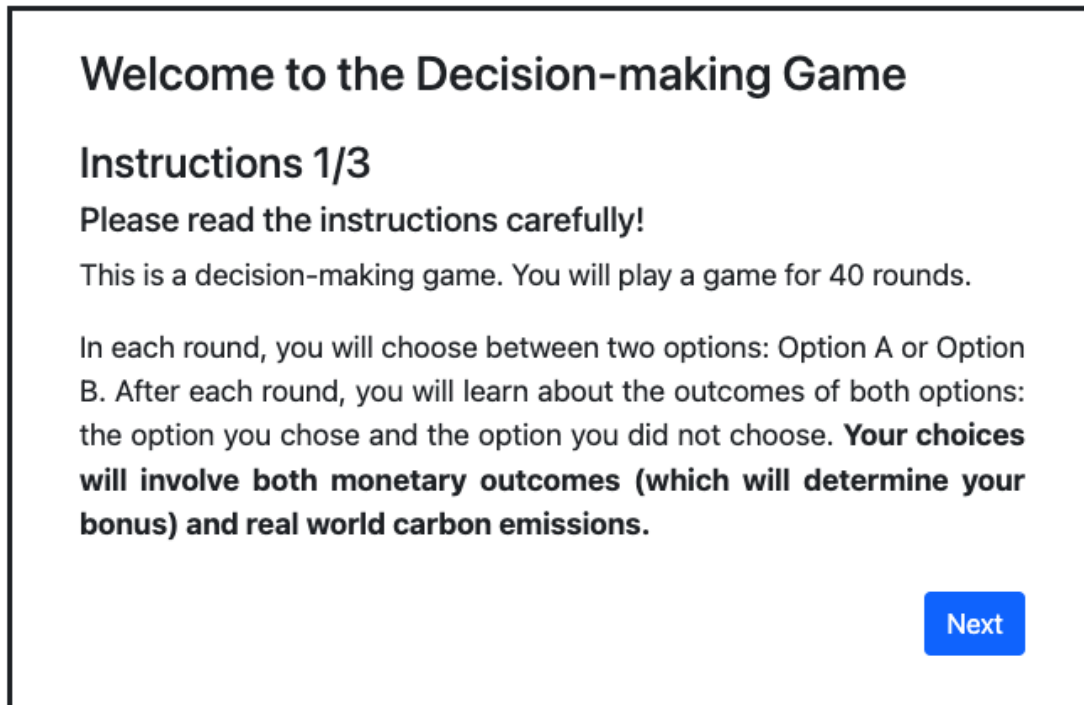
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## Experimental Instructions

Below are screenshots of the three instruction screens that were identical for both studies. Screenshots from the experimental choice task can be found in the manuscript Figure 1. Instruction page 1 is displayed in Figure S1, Instruction page 2 is displayed in Figure S2 and Instruction page 3 is displayed in Figure S3.



*Figure S1.* Screenshot Instruction Page 1.

## Instructions 2/3

Please read the instructions carefully!

### Outcomes affect the Environment:

**Your choices will have environmental consequences.**

Some options cause **carbon (CO<sub>2</sub>) emissions in the real world**. Prior to the study, we reserved carbon emission certificates. Carbon Certificates regulate how much carbon dioxide (CO<sub>2</sub>) can be emitted in total. There is only a limited number of certificates on the market. Think of a CO<sub>2</sub> certificate as an allowance to emit a certain amount of CO<sub>2</sub>.

At the end of the game, one round will be randomly drawn, and the emissions of that round will be realized in the real world. If you chose an option that causes CO<sub>2</sub> emissions in that round, we will return the corresponding amount of CO<sub>2</sub> certificates. They will then be back on the market allowing another buyer to emit this amount of CO<sub>2</sub>. If you choose an option without CO<sub>2</sub> emissions, we will calculate how much CO<sub>2</sub> you saved compared to the other option. We will then destroy the amount of carbon certificates corresponding to your CO<sub>2</sub> savings. Once the CO<sub>2</sub> certificate is destroyed and taken off the market, it reduces the total amount of emission allowances that can be purchased. With less certificates on the market, less carbon can be emitted in total. **This means, for one randomly drawn round, the carbon emissions will be realized in the real world following your choices.**

Do your choices in the decision-making game have a real consequence for the environment?

Figure S2. Screenshot Instruction Page 2.

### Instructions 3/3

Please read the instructions carefully!

#### Outcomes affect your bonus payment

In each round, you can gain or lose points.

**At the end of the study, one round will be randomly drawn.** The outcome from this round will decide your bonus payment and the environmental outcome. The carbon emissions from that round will be realized. The points you gained or lost in that round will be converted into British Pounds (conversion rate: 200 points = £1) and will be added to your initial bonus payment of £1. Note that your bonus payment is never negative. The minimum bonus payment you can get is £0.

**Example:** Imagine you played 2 rounds. In round 1, you lost 100 points and the carbon emissions were 10 pounds. In round 2, you gained 50 points and carbon emissions were zero. At the end, the computer will draw randomly either round 1 or round 2. If round 1 is drawn, your payoff will be -100 points, divided by 200 = -£0.5. Your bonus payment will then be £1 (initial endowment) -£0.5 = £0.5 (equal to around USD \$0.62). The carbon emissions of 10 lbs will be realized by selling a CO2 certificate that allows the buyer to emit 10 lbs of CO2.

In the "Please enter any comments here" textfield below, you have to enter the word **"thanks"** (without the quotes), this is to demonstrate you read and understood all of the instructions.

**Thank you for participating!**

Please enter any comments here:

I have read and understood the instructions.

Next

Figure S3. Screenshot Instruction Page 3.

### Emission Recall Task

Figure S4 shows a screenshot of the incentivized emission recall task with four questions that was used in Study 2.

**Can you recall the emissions for the options in both parts of the game?**

You can win an **additional bonus of 20 points**, if you answer all four questions correctly.

**In part one of the game, how many carbon emissions were caused by each option?**

Option A caused  lbs CO<sub>2</sub>.

Option B caused  lbs CO<sub>2</sub>.

**In part two of the game, how many carbon emissions were caused by each option?**

Option A caused  lbs CO<sub>2</sub>.

Option B caused  lbs CO<sub>2</sub>.

Next

Figure S4. Screenshot Recall Task for Study 2.

### Self Report Scales

Climate change concern and skepticism were measured with an 11-item measure by Tobler et al. (2012). The scale consisted of two subscales (4 items measuring climate change concern, 7 measuring climate change skepticism, see List of items in Figure S5). As preregistered, we aggregated both subscales to a joint variable assessing overall climate change concern as they had excellent internal consistency (Cronbach's  $\alpha = .95$ ). To assess Egalitarian and Collectivist world views, we used three items each from a larger set of items by Kahan et al. (2007). The short 6-item version has previously been used in other studies (Truelove & Greenberg, 2013) and we found acceptable internal consistency for both scales across both experiments (ranging from Cronbach's  $\alpha = .73$  to  $\alpha = .80$ ). Exact items for the Egalitarian vs. Hierarchicalism scale and Collectivist vs. Individualist scale can be found in Figure S6. Besides asking for their political party preference (Categorical Single Choice Format), we also asked whether they would lean more toward the Republican or Democrat party on a range slider from -100 (very much favoring Democrat) to 100 (very much favoring Republican). On an 11-pt Likert scale, they indicated if they identified as liberal or as conservative. We also included demographic questions and an optional open-ended question to provide feedback on the study. Scales were identical for Study 1 and Study 2. Correlations between all self-report scales, demographic variables, sustainable choice rates and Democrat/Republican voters are shown in Figures S11 and S12.

## Attitudes about Climate Change

How much do you agree with the following statements?

|  | not<br>at<br>all      |                       |                       |                       | very<br>much          |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| We must protect the climate's delicate equilibrium.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Climate protection is important for our future.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I worry about the climate's state.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Climate change has severe consequences for humans and nature.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Climate change and its consequences are being exaggerated in the media.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Climate change is a racket.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| As long as meteorologists are not even able to accurately forecast weather, climate cannot be reliably predicted either. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| There are larger problems than climate protection.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I do not feel threatened by climate change.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The impacts of climate change are unpredictable; thus, my climate-friendly behavior is futile.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Climate protection needlessly impedes economic growth.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

*Figure S5.* Screenshot showing Climate Change Concern Questionnaire from Tobler et al. (2012).



## Political Attitudes

How much do you agree with the following statements?

|   | not<br>at<br>all      |                       |                       |                       | very<br>much          |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The government interferes far too much in our everyday lives.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel that people who are successful in business have a right to enjoy their wealth as they see fit.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Too many people expect society to do things for them that they should be doing for themselves.                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Our society would be better off if the distribution of wealth was more equal.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A lot of problems in our society come from the decline in the traditional family, where the man works and the woman stays home. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Discrimination against minorities is still a very serious problem in our country.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Overall, how would you describe your political attitudes and beliefs?

very liberal ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ very conservative

*Figure S6.* Screenshot showing Worldview Items from Kahan et al. (2007). Below is a one item liberal-conservative-measure.

## Please provide some information about yourself

How old are you?

 years

What is your gender?

What is your annual household income?

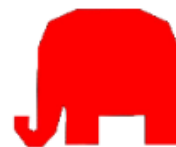
Which of the major parties do you feel more affiliated to?

In the next presidential election, which party would you be more likely to give your vote to?

Democratic  
Party



Republican  
Party



Next

Figure S7. Screenshot showing Demographic Questions with categorical (“Democratic Party”, “Republican Party”, “Other; Please Specify”) and range slider party preference.

### Attention and Comprehension Checks

In both studies, we employed various soft attention checks to test if participants carefully read the instructions, understood the task and followed simple directions. In the second study, following recommendations by Roth and Yakobi (2024), we used fewer attention checks than in Study 1. For the first study, the preregistered inclusion criterion was passing the first and last attention check. Below, we report robustness analyses for Study 1 with all participants including inattentive participants. For the second study, we did not exclude any participants based on their responses to the attention checks. Below, we report robustness of results when including only attentive (passing all four attention checks) for Study 2. The comprehension/attention checks are described in the following:

On the second instruction page, we provided information about the realization of carbon emissions and asked participants if their choices would have real environmental consequences (binary format: yes/no;cf. Figure S2). In Study 1, 98% answered this correctly. In Study 2, 97% of participants correctly answered this.

On the instruction page explaining the task, participants were asked to type the word “thanks” in a text box (cf. Figure S3). In Study 1, participants who failed to do so read a highlighted warning that their response was incorrect and were asked to re-read the instructions (there was also a ten second time penalty before they could proceed). If they failed a second time, they would not be notified and allowed to continue with the study. From those 17% of participants who failed in their first attempt, 96% got it correct by the second try, i.e. more than 99% of the total sample passed the first attention check. In Study 2, 80% of participants answered correctly in the first try. There was no second strike and participants in the second study could proceed regardless of their response.

We tested if participants correctly understood the description of the task. Participants saw a preview of the game describing the choice options and their outcomes. They were then

asked to enter the amount of carbon emissions associated with each choice option in text boxes below (see Screenshot in Figure 3). In Study 1, but not in Study 2, participants were required to repeat this if they failed to answer correctly on their first try. More than 98% of participants passed this comprehension check. In Study 2, in each block, 98% of participants correctly entered the emissions. See screenshots of the comprehension checks in Figure S8 for Study 1 and in Figure S9 for Study 2.

In Study 1, after the choice task, we tested whether participants made a sensible choice in a choice task with 5 options. One option was strictly dominant yielding the highest payoff for sure (and caused no emissions). The share of participants who chose the dominant option was 84%.

In Study 1, the climate change concern scale included one attention item that read “In this row, please mark the third circle (center circle) to indicate you are paying attention.” This was correctly followed by 98% of participants. This was the last attention check and failing it was an exclusion criterion.

## Preview of the Game

Below is a preview of the game.

Please note that choosing **Option A**, will not cause any carbon emissions. If you choose **Option B**, it will cause **11 pounds of carbon (CO<sub>2</sub>) emissions** (11 lbs  $\approx$  5 metric kilos).

While this is just a rough estimate, **you can think about 11 lbs CO<sub>2</sub> as being equivalent to travelling 20 miles in an average passenger car.**

### Please make a choice

Please choose one of the options. If you choose Option A, you will **gain 2 points**. If you choose Option B, you will have a 90% chance to **gain 20 points** and a 10% chance to **lose -200 points**.

|                  | Option A <span>No emissions</span> | Option B <span>11 lbs CO<sub>2</sub> emissions</span>  |
|------------------|------------------------------------|--|
| <b>Payoff</b>    | Get <b>2</b> points for sure       | Get <b>20</b> points with <b>90%</b> probability<br>Get <b>-200</b> points with <b>10%</b> probability |
| <b>Emissions</b> | Emit <b>0</b> lbs CO <sub>2</sub>  | Emit <b>11</b> lbs CO <sub>2</sub>   |

Choose Option A
Choose Option B

**How many carbon emissions are caused by each option?**

Option A causes  lbs CO<sub>2</sub>.

Option B causes  lbs CO<sub>2</sub>.

Next

Figure S8. Screenshot with task preview and Comprehension Question for Study 1.

## Preview of the Game

Below is a preview of the game.

If you choose Option A, you will **gain 7 points**. This option emits **15 lbs of CO<sub>2</sub>**.

If you choose Option B, you will have a 90% chance to **gain 30 points** and a 10% chance to **lose -200 points**. This option emits **0 lbs of CO<sub>2</sub>**.

While this is just a rough estimate, you can think about 15 lbs CO<sub>2</sub> (15 lbs  $\approx$  7 metric kilos) as being **equivalent to travelling 28 miles in an average passenger car**.

### Please make a choice

|                  | Option A <b>15 lbs emissions</b>   | Option B <b>no emissions</b>   |
|------------------|------------------------------------|--|
| <b>Payoff</b>    | Get <b>7</b> points for sure       | Get <b>30</b> points with <b>90%</b> probability<br>Get <b>-200</b> points with <b>10%</b> probability |
| <b>Emissions</b> | Emit <b>15</b> lbs CO <sub>2</sub> | Emit <b>0</b> lbs CO <sub>2</sub>  |
|                  | <b>Choose Option A</b>             | <b>Choose Option B</b>   |

### How many carbon emissions are caused by each option?

Option A causes  lbs CO<sub>2</sub>.

Option B causes  lbs CO<sub>2</sub>.

**Next**

Figure S9. Screenshot with task preview and Comprehension Question for Study 2.

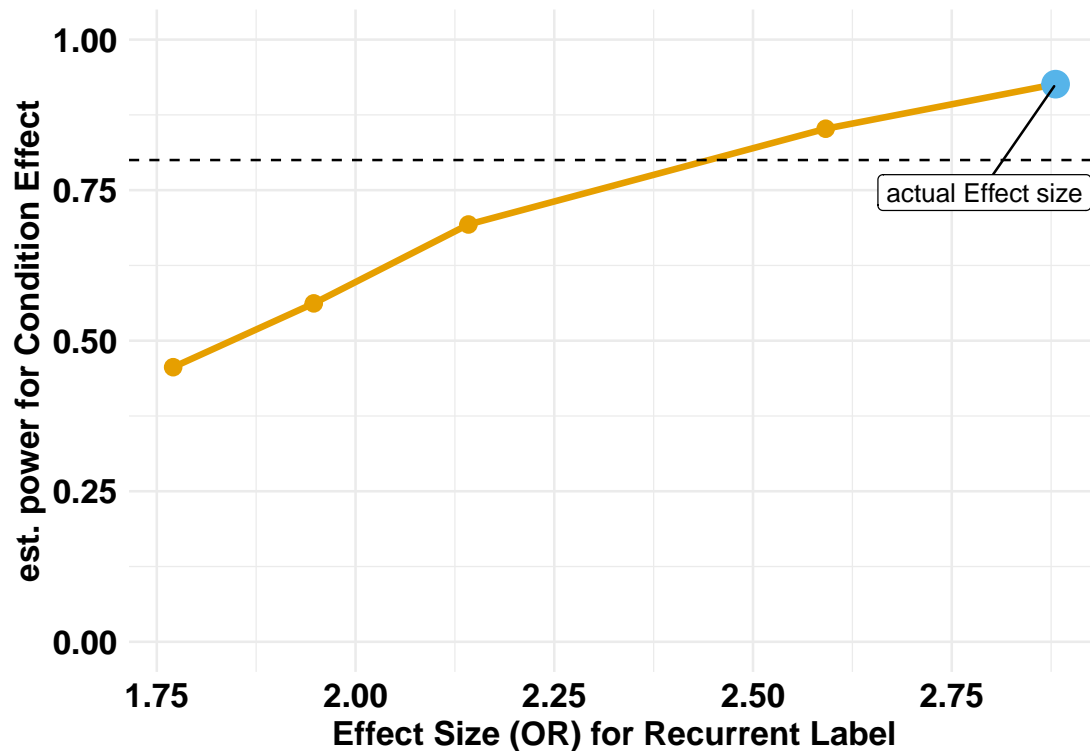
## Study 1

### Sensitivity Analysis

We computed post-hoc sensitivity to estimate the power of the Study 1 research design to detect various effect sizes using the package `mixedpower` (Kumle, Vö, & Draschkow, 2021). We computed the estimated power to detect a main effect of Recurrent vs. One-Off labels for various effect sizes. As effect sizes we used the actual effect size found in Study 1 ( $OR = 2.88$ ) and 90%, 80%, 70% and 60% of the actual effect size (percentages computed from log-odds). The log-odd effect sizes were 0.57, 0.67, 0.76, 0.95, and 1.06. For an effect size of  $OR = 2.55$  (which is 0.95 in log-odds and 90% of the original effect size), the estimated power to detect a significant main effect of label condition was 85.2%. For all other effect sizes we tested, the estimated power of our research design was below the minimally desired power of 80%. Figure S10 shows the computed power for various effect sizes of recurrent label effect, with all else being equal (effect sizes for the fixed effects of round number and political party as well as the variance for random effects remained identical, the sample size was  $N = 386$ , i.e. the number of participants in Study 1 in the Externality Conditions). The R-Skript to compute the sensitivity analysis as well as the power analysis for study one can be found in the OSF repository: <https://osf.io/e78da/>.

### Correlation between Self Report Scales and Voter group

Individual differences measures showed high correlations. Climate change concern was positively associated with holding more Egalitarian (as opposed to Hierarchical) values, and negatively associated with leaning towards the Republican party and Individualist (as opposed to Communitarian) values, cf. Figure S11. Descriptive Statistics for Climate Change concern and Correlations between Concern and partisan group can be found in Table S1 for Study 1 and Study 2. Note that the correlation coefficients for votes Republican and Climate change concern slightly differs between Figure S11 and Table S1. This is because in the table, we report point biserial correlation, which was not available for the correlation plot



*Figure S10.* Estimated sensitivity to Detect an effect for different effect sizes with the research design of Study 1. Dashed line shows the 80% benchmark for minimally desired power.

(that by default uses Pearson correlations). Point-biserial correlation is more accurate here as partisan group is not a continuous measures, differences are minimal though.

### **Robustness Analysis including participants with ‘Other’ Party Preference**

Other than preregistered, we excluded participants who indicated “Other” in a single choice item asking for party preference. We did this for practical reasons: We had preregistered to enter political party as a categorical binary predictor. Since we used party preference (either Republican or Democrat) as a prescreener, we had not anticipated that participants would indicate a different party preference.

To test if this exclusion criterion resulted in different results, we repeated the main analysis from the manuscript including participants with “Other” party preference. Instead



Table S1

*Climate Change Concern by Political Partisanship*

|                     | <b>Study 1</b>     |                   | <b>Study 2</b>     |                   |
|---------------------|--------------------|-------------------|--------------------|-------------------|
|                     | <b>Democrat</b>    | <b>Republican</b> | <b>Democrat</b>    | <b>Republican</b> |
|                     | (N=244)            | (N=242)           | (N=389)            | (N=393)           |
| Mean                | 4.30               | 2.55              | 4.05               | 2.61              |
| SD                  | 0.737              | 1.32              | 0.838              | 1.27              |
| <i>t</i> -value     | 18.03              |                   | 18.74              |                   |
| <i>df</i>           | 378.07             |                   | 678.58             |                   |
| <i>p</i> -value     | <0.001             |                   | <0.001             |                   |
| Correlation         | 0.635              |                   | 0.556              |                   |
| $\eta^2$ [ 95% CI ] | 0.40, [0.35, 1.00] |                   | 0.31, [0.27, 1.00] |                   |

of using the categorical variable party preference (Republican/Democrat) as a predictor variable, we used the variable leaning towards the Democratic vs. Republican party measured on a range slider. We ran a logistic mixed effects regression model with random intercepts per participant on carbon neutral choices (Safe and carbon neutral in the externality conditions = 1 vs. Risky and emitting in the externality conditions = 0). As fixed effects, we entered round number (standardized), experimental condition and partisan leaning (standardized) measured with a continuous range slider.

As can be seen in Table S2, political party preference was a significant predictor for carbon neutral choices. The effect of condition was also significant with higher carbon neutral choice rates in the One-off label and Recurrent label condition compared to the Control condition. Results from the model including all participants are qualitatively equivalent to the results reported in the manuscript.

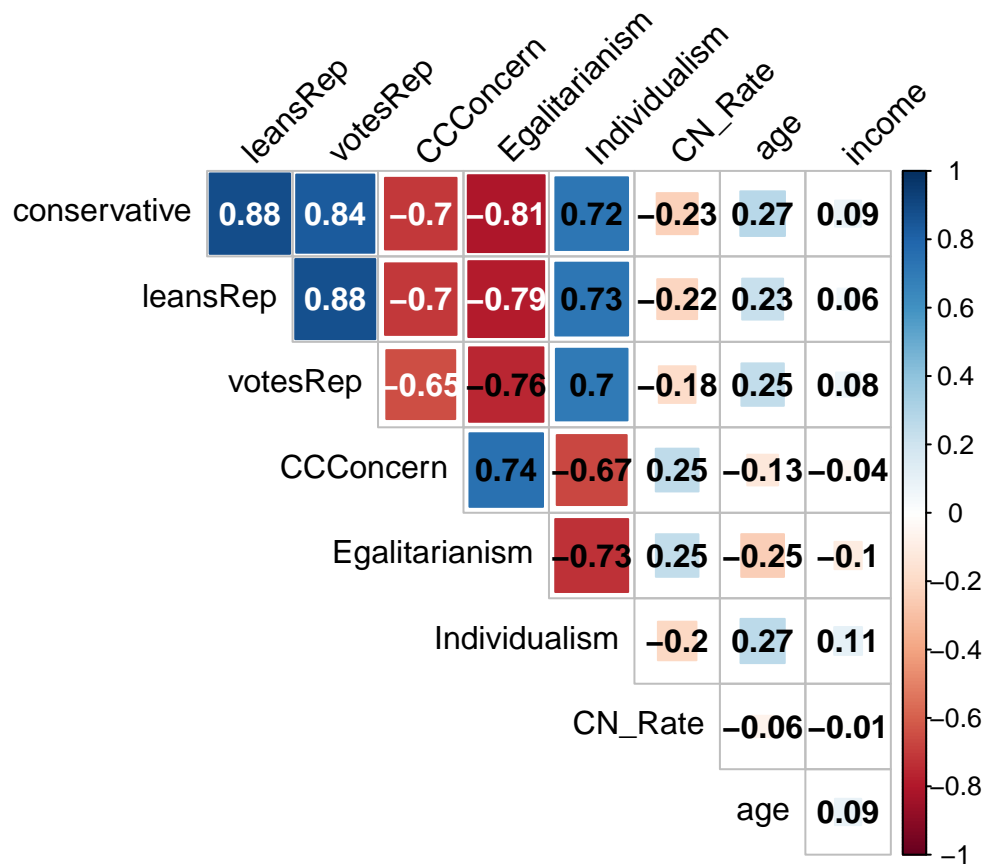


Figure S11. Correlation of self-report scales, choice rates and demographic information in Study 1.

Table S2

*Mixed Effect Regression Model for Study 1*

| term                    | OR    | 95%CI         | <i>z</i> | <i>p</i> |
|-------------------------|-------|---------------|----------|----------|
| Intercept               | 0.23  | [0.13, 0.4]   | -5.20    | < .001   |
| Round number (std.)     | 1.30  | [1.25, 1.35]  | 13.27    | < .001   |
| Leans Republican (std.) | 0.50  | [0.38, 0.64]  | -5.35    | < .001   |
| One-off Label           | 3.98  | [2, 7.94]     | 3.93     | < .001   |
| Recurrent Label         | 11.21 | [5.61, 22.39] | 6.84     | < .001   |

*Note.* Sample including participants with other party preference

Table S3

*Mixed Effect Regression Model for Study 1*

| term                | OR    | 95%CI         | $z$   | $p$    |
|---------------------|-------|---------------|-------|--------|
| Intercept           | 0.44  | [0.24, 0.82]  | -2.60 | .009   |
| Round number (std.) | 1.30  | [1.25, 1.35]  | 13.15 | < .001 |
| Party: Republican   | 0.27  | [0.16, 0.46]  | -4.95 | < .001 |
| One-off label       | 4.02  | [2, 8.09]     | 3.90  | < .001 |
| Recurrent label     | 10.73 | [5.32, 21.63] | 6.64  | < .001 |

*Note.* Sample including inattentive participants**Robustness Analysis including inattentive participants**

Including inattentive participants in Study 1, did not change the main findings. We ran the same logistic mixed effect model as reported in the manuscript including inattentive participants. Again, there were significant effects for round number, for the Recurrent and One-off label conditions as well as a significant effect of political party affiliation. See the odds ratios (for fixed effects) of the mixed effect logistic regression model with random intercepts per participants in Table [S3](#).

**Study 2****Correlation between Self Report Scales and Voter group**

Individual differences measures showed high correlations and were similar to Study 1. The relationship between political partisanship and climate change concern was strong, as can be seen in Table [S1](#). Climate change concern was positively associated with holding more Egalitarian (as opposed to Hierarchical) values, and negatively associated with leaning towards the Republican party and Individualist (as opposed to Communitarian) values, cf. Figure [S12](#).

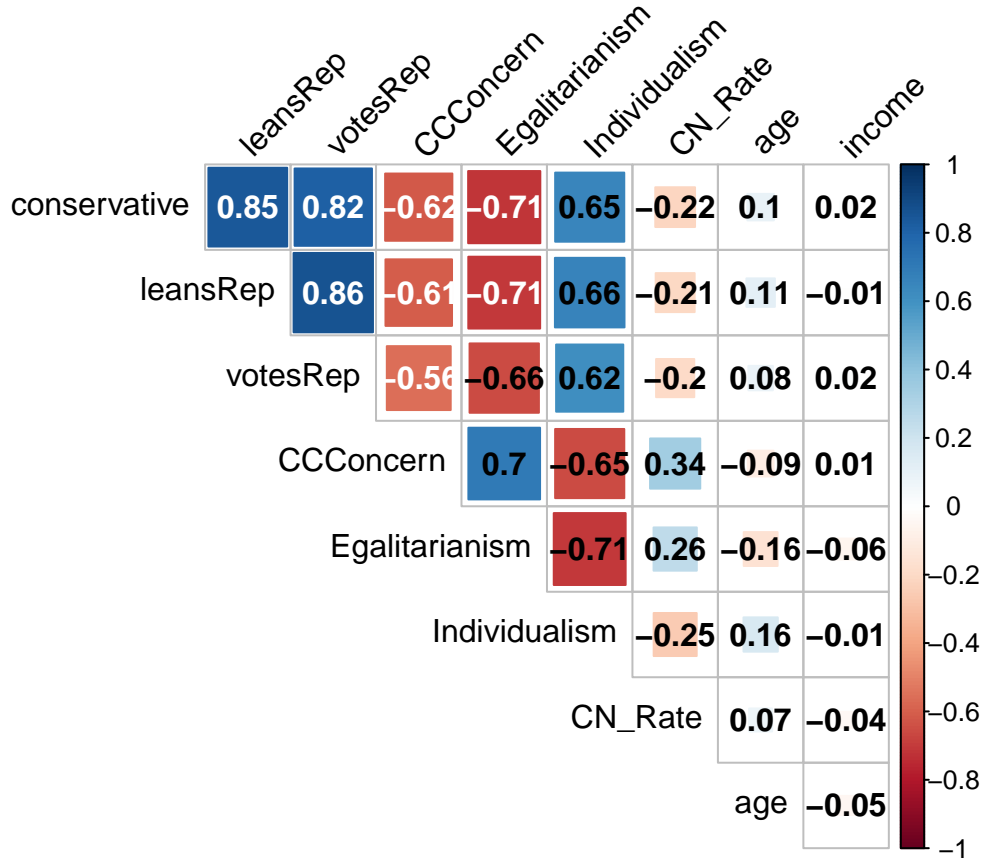


Figure S12. Correlation of self-report scales, choice rates and demographic information in Study 2.

### Robustness Analysis including participants with Other Party Preference

As preregistered, we excluded participants who indicated “Other” in a single choice item asking for party preference. To test if this exclusion criterion resulted in different results, we repeated the main analyses from the manuscript including participants with “Other” party preference. Instead of using the binary variable party preference (Republican/Democrat) as a predictor variable, we used the variable leaning towards the Democratic vs. Republican party measured on a range slider. We ran a logistic mixed effects regression model with random intercepts per participant on carbon neutral choices (Carbon neutral choices = 1 vs. emitting choices = 0). As fixed effects we entered round number (standardized), block (Block 1 vs. Block 2), carbon label timing condition and partisan

Table S4

*Mixed Effect Regression Model for Study 2*

| term                    | OR   | 95%CI        | $z$   | $p$    |
|-------------------------|------|--------------|-------|--------|
| Intercept               | 3.58 | [2.95, 4.35] | 12.84 | < .001 |
| Round number (std.)     | 0.96 | [0.93, 0.99] | -2.86 | .004   |
| 2nd Block               | 1.03 | [0.97, 1.09] | 0.94  | .345   |
| Leans Republican (std.) | 0.65 | [0.57, 0.74] | -6.21 | < .001 |
| Recurrent Label         | 1.45 | [1.11, 1.91] | 2.68  | .007   |

*Note.* Sample including participants with 'other' party preference

leaning (standardized) measured with a continuous range slider.

As can be seen in Table S4, political party preference was a significant predictor for carbon neutral choices. The effect of condition was also significant with higher carbon neutral choice rates for recurrent than for one-off labels. Results from the model including all participants are qualitatively equivalent to the results reported in the manuscript.

**Recall Accuracy.** We ran a linear regression model with emission recall performance as the dependent variable using the full sample including participants with “other” as their party preference. Label timing condition and partisan leaning were entered as fixed effects. The results for the recall task remained qualitatively the same when Other-party-preference participants were included. There was no significant effect of leaning towards the Republican party ( $b = -0.06$ , 95% CI  $[-0.13, 0.01]$ ,  $t(786) = -1.66$ ,  $p = .098$ ) on correct emission recall, and no significant effect of the Recurring label condition on correct emission recall ( $b = -0.06$ , 95% CI  $[-0.20, 0.09]$ ,  $t(786) = -0.76$ ,  $p = .449$ ).

### Robustness Analysis Only Attentive Participants

As preregistered, we also reran the mixed effect regression model including only attentive participants (passing all four attention and comprehension checks). We excluded  $N = 187$  participants who failed one or more attention checks, leaving 595 (76%) participants in the sample. The logistic mixed effect model was specified as the model reported in the manuscript with carbon neutral choices as the dependent variable and random intercepts per participant. Regression coefficients for this model can be found in Table S5. As before, the effects of political party and recurrent labels were significant.

Table S5

*Mixed Effect Regression Model for Study 2*

| term                | OR   | 95%CI        | $z$   | $p$    |
|---------------------|------|--------------|-------|--------|
| Intercept           | 6.78 | [5.08, 9.07] | 12.93 | < .001 |
| Round number (std.) | 0.95 | [0.92, 0.99] | -2.84 | .005   |
| 2nd Block           | 0.98 | [0.92, 1.05] | -0.56 | .573   |
| Party: Republican   | 0.34 | [0.25, 0.48] | -6.42 | < .001 |
| Recurrent Label     | 1.47 | [1.06, 2.03] | 2.32  | .020   |

*Note.* Sample including only attentive participants

**Recall Accuracy.** When including only attentive participants, there emerged a significant effect for Political Party on recall accuracy that we did not find in the main analysis including all participants. Republicans performed slightly worse at emission recall than Democrats ( $b = -0.17$ , 95% CI  $[-0.32, -0.01]$ ,  $t(592) = -2.06$ ,  $p = .040$ ). As in the main analysis, there was no effect for condition and recurring labels did not improve emission recall ( $b = 0.03$ , 95% CI  $[-0.13, 0.18]$ ,  $t(592) = 0.32$ ,  $p = .751$ ).

### Software used for statistical data analysis

We used R version 4.4.0 (R Core Team, 2024) and the following R packages: broom.mixed v. 0.2.9.5 (Bolker & Robinson, 2024), corrplot v. 0.92 (Wei & Simko, 2021), ggpattern v. 1.0.1 (FC, Davis, & ggplot2 authors, 2022), grateful v. 0.2.4 (Francisco Rodriguez-Sanchez & Connor P. Jackson, 2023), kableExtra v. 1.4.0 (Zhu, 2024), knitr v. 1.46 (Xie, 2014, 2015, 2024), lme4 v. 1.1.35.5 (Bates, Mächler, Bolker, & Walker, 2015), lmerTest v. 3.1.3 (Kuznetsova, Brockhoff, & Christensen, 2017), papaja v. 0.1.2 (Aust & Barth, 2023), patchwork v. 1.2.0 (Pedersen, 2024), rmarkdown v. 2.27 (Allaire et al., 2024; Xie, Allaire, & Grolemund, 2018; Xie, Dervieux, & Riederer, 2020), scales v. 1.3.0 (Wickham, Pedersen, & Seidel, 2023), sjPlot v. 2.8.16 (Lüdecke, 2024), table1 v. 1.4.3 (Rich, 2023), tidyverse v. 2.0.0 (Wickham et al., 2019), running in RStudio v. 2024.9.0.375 (Posit team, 2024).

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