Supplementary Information

Uncertainty about Carbon Impact and the Willingness to Avoid CO_2 Emissions

Davide D. Pace
Taisuke Imai
Peter Schwardmann
Joël J. van der Weele

Contents

A Additional Results

A.1 Study 1: Survey about Subjective Uncertainty

Supplementary Table 1: Demographic characteristics.

Age		
18-27	223	0.198
28-37	267	0.237
38-47	195	0.173
48-57	186	0.165
58+	257	0.228
Gender		
Female	525	0.504
Male	505	0.485
Other	12	0.012
Ethnicity		
Asian	70	0.067
Black	141	0.135
Mixed	30	0.029
White	776	0.745
Other	25	0.024
Party affiliation		
Republican	152	0.148
Republican-leaning independent	68	0.066
Independent	202	0.197
Democratic-leaning independent	147	0.143
Democratic	456	0.445
Political orientation		
Conservative	100	0.098
Somewhat conservative	225	0.220
Somewhat liberal	324	0.316
Liberal	376	0.367

Education		
Less than high school	8	0.008
High school degree	107	0.104
Some University but no degree	288	0.281
Bachelor Degree	373	0.364
Postgradute degree	249	0.243
Household income		
- $5,000	26	0.025
$5,000 - $15,000	68	0.066
$15,000 - $30,000	129	0.126
$30,000 - $45,000	130	0.127
$45,000 - $60,000	136	0.133
$60,000 - $75,000	114	0.111
$75,000 - $90,000	88	0.086
$90,000 - $105,000	83	0.081
$105,000 - $120,000	90	0.088
$120,000 - $135,000	30	0.029
$135,000 - $150,000	37	0.036
$150,000 -	94	0.092

Notes: 1,128 participants completed the belief elicitation task.

Supplementary Table 2: Representativeness of the sample.

	Sample	Population	
Age			
18-27	0.198	0.172	
28-37	0.237	0.176	
38-47	0.173	0.160	
48-57	0.165	0.162	$\chi^2(4) = 64.658$
58+	0.228	0.330	$p < 0.001$
Gender			
Female	0.510	0.504	$\chi^2(1) = 0.1453$
Male	0.490	0.496	$p = 0.7031$
Ethnicity			
Asian	0.071	0.064	
Black	0.143	0.142	$\chi^2(2) = 0.7821$
White	0.786	0.794	$p = 0.6763$

Notes: Population-level data is retrieved from US Census Bureau (2022).

A.2 Study 2: Risk Aversion Experiment

A.2.1 Demographic characteristics

Supplementary Table 3: Demographic characteristics.

			Treatment		
		All	*Information*	*Uncertainty*	
Age bracket					
18-27	277	0.184	0.178	0.190	$\chi^2(4) = 1.06$
28-37	482	0.320	0.331	0.310	$p = 0.90$
38-47	354	0.235	0.230	0.241	
48-57	235	0.156	0.155	0.157	
58+	157	0.104	0.106	0.102	
Gender					
Male	744	0.494	0.490	0.499	$\chi^2(2) = 1.47$
Female	754	0.501	0.507	0.495	$p = 0.48$
Other	7	0.005	0.003	0.007	
Political view					
Left	295	0.196	0.190	0.202	$\chi^2(4) = 1.06$
Center-left	445	0.296	0.303	0.289	$p = 0.90$
Center	493	0.328	0.321	0.334	
Center-right	214	0.142	0.145	0.140	
Right	58	0.039	0.041	0.036	
Education					
Less than high school	27	0.018	0.013	0.023	$\chi^2(4) = 7.18$
High school	330	0.219	0.211	0.227	$p = 0.127$
Some University	176	0.117	0.120	0.114	
Bachelor	658	0.437	0.465	0.410	
Postgraduate	314	0.209	0.191	0.226	
Income					
- £5,000	27	0.018	0.020	0.016	$\chi^2(8) = 15.68$
£5,000 - £15,000	134	0.089	0.092	0.086	$p = 0.047$
£15,000 - £30,000	329	0.219	0.220	0.217	
£30,000 - £45,000	321	0.213	0.218	0.209	
£45,000 - £60,000	246	0.163	0.151	0.176	
£60,000 - £75,000	183	0.122	0.139	0.104	
£75,000 - £90,000	124	0.082	0.084	0.081	
£90,000 - £105,000	60	0.040	0.024	0.056	
£105,000 -	81	0.054	0.052	0.056	

A.2.2 Shape of the individual-level WTM curve

We elicited willingness to mitigate (WTM) across six emission levels: 0, 4, 8, 12, 16, and 20 kilograms of CO_2 emissions. In this analysis, we focus on characterizing the shape of individual-level WTM curves. Let (e_i, w_i) denote the pair of emission size e_i and the reported WTM $w_i \in [0, 7]$, for each $i = 1, \ldots, 6$. It is important to note that in this analysis, we consider the entire range of 0-20 kg, as opposed to the more constrained range of 0-8kg (used in Supplementary Table 4 below) when classifying the shape of these curves.

Step 1. For each participant, we construct a piecewise linear WTM curve using linear interpolation, consisting of five line segments. The WTM curve has five line segments. The slope of the ith line segment, denoted as s_i, is given by:

$$s_i = \frac{w_{i+1} - w_i}{e_{i+1} - e_i}.$$

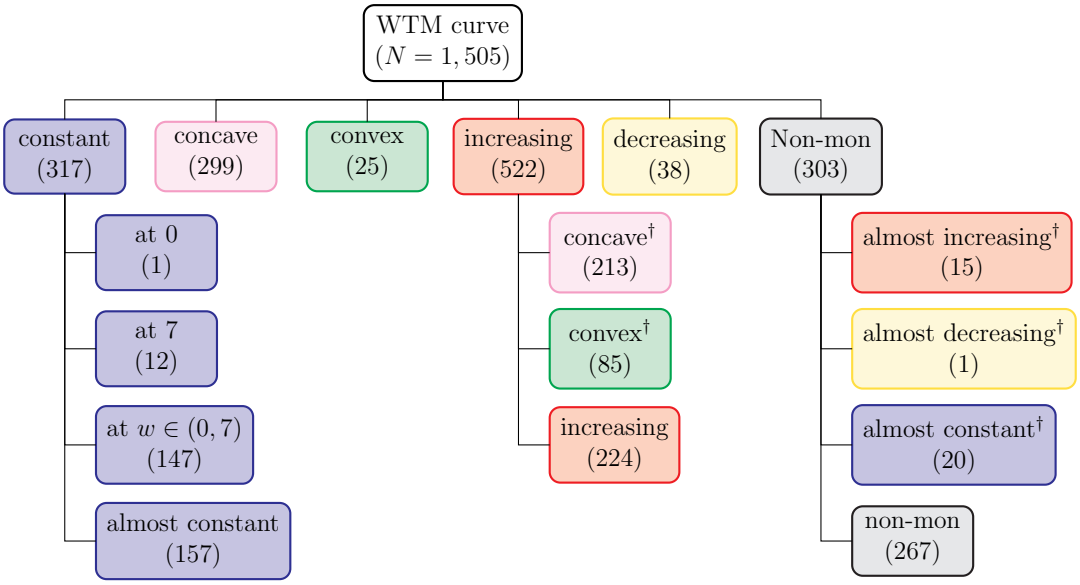
We apply the following rule sequentially to classify the shape of the WTM curve.[1] We say that a WTM curve is

- *constant* if $s_i = 0$ for all i;
- *almost constant* if $\max w_i - \min w_i \leq 0.5$, i.e. the step size of the MPL;
- *decreasing* if $s_i \leq 0$ for all i with at least one strict inequality;
- *concave* if $s_{i+1} \leq s_i$ for all i with at least one strict inequality;
- *convex* if $s_{i+1} \geq s_i$ for all i with at least one strict inequality;
- *increasing* if $s_i \geq 0$ for all i with at least one strict inequality;
- *non-monotonic* if it does not fall into any of the above categories.

In our dataset, we identified 317 WTM curves as (almost) constant, 38 as decreasing, 299 as concave, 25 as convex, and 522 as increasing. The remaining 303 WTM curves exhibit a non-monotonic behavior.

Step 2. Let us direct our attention to the subset of 522 participants whose WTM curves exhibit an increasing trend while not falling into the categories of concave or convex shapes. Among these participants, 66 individuals have their WTM values censored at a maximum of £7. Let $\bar{w}$ represent the largest observed WTM value. If $\bar{w} = 7$, we define $\bar{e}$ as the smallest emission level e_i for which $w_i = 7$. If $\bar{w} < 7$, on the other hand, we set

[1] This means that *concave* and *convex* WTM curves in this classification are non-decreasing, and *increasing* WTM curves are neither concave nor convex. We classify *linear* WTM curves as *concave*.



Supplementary Figure 1: Classification of individual-level WTM curves.

$\bar{e} = e_6$. Next, we draw a chord connecting two points: (e_1, w_1) and $(\bar{e}, \bar{w})$. We say that a WTM curve is *concave*† (*convex*†) if the points (e_i, w_i) for which $e_i \leq \bar{e}$ lie above (below) the chord. In our dataset, we identified 213 WTM curves as concave† and 85 as convex†.

Step 3. Finally, we turn to the remaining 303 participants whose WTM curves exhibit non-monotonic behavior.

First, we say that a WTM curve is *almost constant*† if the difference between the largest and smallest WTM values does not exceed £1, which corresponds to two steps in the MPL. This relaxation captures the shape of an additional 20 WTM curves.

Second, we say that a WTM curve is *almost increasing*† (*almost decreasing*†) if the piecewise linear WTM curve has only one line segment with a negative (positive) slope, and the relative change of WTM on that segment is "not too large".[2] This relaxation captures the shape of an additional 16 WTM curves.

Classification summary. Allowing some margin of error, we have established a comprehensive and mutually exclusive classification of individual-level WTM curves as follows: 337 are constant, 512 are concave, 110 are convex, 239 are increasing, 39 are decreasing, and 267 are non-monotonic.

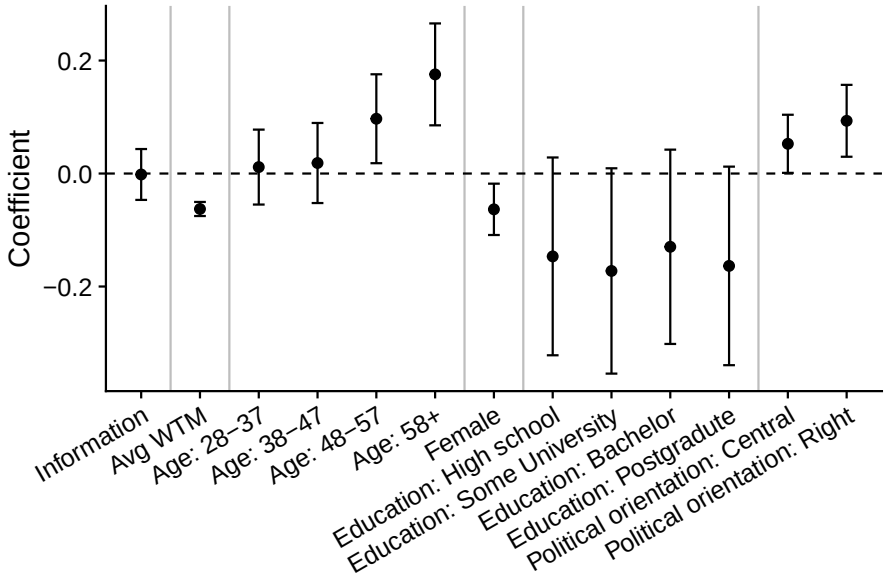
[2]Suppose the sign of the slopes changes on the segment connecting (e_j, w_j) and (e_{j+1}, w_{j+1}). We require the absolute relative change to be less than 10%, i.e., $|(w_{j+1} - w_j)/w_j| \leq 0.1$.

A.2.3 Purchasing decisions

Supplementary Table 4: Effect of uncertainty on purchasing decisions.

	(1)	(2)	(3)	(4)	(5)	(6)
Information	−0.008	−0.008	0.011	0.014	0.00002	0.002
	(0.024)	(0.034)	(0.032)	(0.027)	(0.034)	(0.032)
Concavity				−0.032		−0.067
				(0.026)		(0.061)
Info × Concavity				−0.069*		−0.043
				(0.035)		(0.064)
Average WTM				−0.037***		−0.034*
				(0.009)		(0.015)
Concavity alt					0.022	
					(0.033)	
Info × Concavity alt					−0.074	
					(0.046)	
Constant	0.571***	0.437*	0.644***	0.709***	0.516**	0.697***
	(0.127)	(0.194)	(0.147)	(0.118)	(0.170)	(0.118)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,505	827	678	1,162	912	1,118
R^2	0.054	0.058	0.075	0.100	0.052	0.102

Notes: Models (1) to (5) are linear regressions. Model (6) is an IV regression. The dependent variable is `product_bought`, a dummy equal to 1 if the participant bought the convenience product. `Information` is a treatment dummy equal to 1 in the *Information* treatment. `Concavity` is given by $\text{WTM}_4 - (\text{WTM}_0 + \text{WTM}_8)/2$, `Average WTM` is given by $(\text{WTM}_0 + \text{WTM}_4 + \text{WTM}_8)/3$, and `Concavity_alt` is given by dividing `Concavity` by $(\text{WTM}_8 - \text{WTM}_0)/2$. Column 1 uses all the observations. Column 2 includes only the participants with a strictly concave WTM in the interval 0-8kg. Column 3 includes only the participants with a strictly convex or linear WTM in the 0-8kg interval. Column 4 excludes the participants whose WTM is censored or decreasing in the 0-8kg interval. Column 5 further excludes the participants for whom $\text{WTM}_0 = \text{WTM}_8$, since `Concavity alt` is not defined for them. Column 6 instruments `Concavity`, `Info*Concavity`, and `Average WTM` with their equivalent variables coming from the unincentivized WTM elicitation. This column excludes the participants with decreasing or censored WTM in any of the elicitations. List of control variables common to all regressions: age, gender (male, female, other), political affiliation (5 categories), education (6 categories), income (7 categories), and time needed to complete the first real effort task. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.



Supplementary Figure 2: Estimated coefficients from a linear regression. *Notes*: The dependent variable is `product_bought`, which is a dummy equal to 1 if the participant bought the computer code. The intercept is not shown for a better visual rendering. The baseline categories are: "18-27" for `Age`, "Male" for `Gender`, "Less than high school" for `Education`, and "Left wing" for `Political orientation`. Bars indicate 95% CI.

A.2.4 Psychological mechanisms behind concavity

We empirically explore two potential psychological mechanisms that may give rise to a concave WTM curve. The first mechanism relates to individuals' inability to appreciate increasingly large (and unfamiliar) amounts of emissions. The second mechanism considers the possibility that the concavity in WTM arises from concave moral judgments about the acceptability of causing different levels of emissions. Our data does not support either of these two mechanisms. However, based on the framing of the elicitation questions, we propose that the concavity we found is more likely due to a marginally decreasing disutility from CO_2 emissions — which are seen as a loss — rather than decreasing marginal utility from implementing offsets — which are seen as a gain.

Increasing cognitive uncertainty. People may perceive the questions involving larger emission quantities as more challenging due to the inherent complexity of visualizing the precise scale of higher levels of emissions. This heightened level of complexity can lead participants to experience greater cognitive uncertainty when deciding their WTM, making them less sensitive to variations in increases in emission sizes. This relation between cognitive uncertainty and valuation can generate a concave WTM curve within the framework of an "anchoring and adjustment" model, in which the weight attributed to the anchor increases with cognitive uncertainty (Enke and Graeber, 2023). The anchor, in this case, is the default behaviour of not compensating for CO_2 emission produced in everyday life.

The anchoring and adjustment model predicts the concavity of WTM under two conditions: (a) individuals generally do not engage in emissions offsetting, making an anchor value of £0 a plausible assumption, and (b) cognitive uncertainty increases with emission size. We find empirical support for both of these underlying assumptions. Specifically, over 82.7% of our participants reported to "Never" or "Rarely" compensate for their emissions. Furthermore, in a regression that controls for demographic characteristics, we find that cognitive uncertainty increases with emission size ($t(1231) = 8.132$, 95% CI $[0.067, 0.109]$, two-sided $p < 0.001$).

However, our analysis does not reveal any substantial evidence of a relationship between cognitive uncertainty and the concavity of the WTM curve. In Supplementary Table 5, we present the results of a regression in which the WTM is regressed on a) cognitive uncertainty, b) emission levels, c) the square of the emission levels, d) the interaction between cognitive uncertainty and the emission levels, and e) the interaction between cognitive uncertainty and the square of the emission levels. We include the square of the emissions to account for potential nonlinear associations between emissions and WTM. The interaction between the square of emissions and cognitive uncertainty is included to explore whether higher levels of uncertainty are linked to more pronounced

Supplementary Table 5: Concavity of WTM and cognitive uncertainty.

	(1)	(2)
Emissions	0.16859***	0.16906***
	(0.01090)	(0.01204)
Emissions^2	−0.00327***	−0.00322***
	(0.00043)	(0.00048)
Cognitive uncertainty	0.00776	0.00940
	(0.00785)	(0.00858)
Cognitive uncertainty × Emissions	0.00164	0.00126
	(0.00198)	(0.00213)
Cognitive uncertainty × Emissions^2	−0.00009	−0.00008
	(0.00009)	(0.00009)
Constant	0.10094	0.14302
	(0.58873)	(0.65010)
Controls	Yes	Yes
Observations	7,392	6,222
Clusters	1,232	1,037
R^2	0.1494	0.1485

Notes: The dependent variable is WTM. The first column includes only the participants that have an uncensored WTM for all 6 emission amounts. The second column further excludes the participants who said that offset all their emissions or that they "often" offset their emissions. List of control variables common to all regressions: age, gender (male, female, other), political affiliation (5 categories), education (6 categories), income (7 categories), and time needed to complete the first real effort task. Standard errors clustered at the individual level are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

concavity, which a negative coefficient for the interaction term would indicate. Column (1) of Supplementary Table 5 shows that the coefficient indeed appears negative, but it is small in magnitude and fails to reach statistical significance ($t(1231) = -0.987$, 95% CI $[-2.6 \cdot 10^{-4}, 8.5 \cdot 10^{-5}]$, two-sided $p = 0.324$). Column (2) restricts the sample to subjects who "Never" or "Rarely" compensate for their emissions and confirms the null result.

Another approach to assess the relationship between an increase in cognitive uncertainty and a concave WTM involves examining whether individuals with greater uncertainty as emissions rise are more likely to exhibit a concave WTM curve. To do this, we define $CU_j(e)$ as the cognitive uncertainty of participant j at emission level e. The increase in cognitive uncertainty can then be quantified as:

$$\Delta_{CU} = CU_j(\bar{e}) - CU_j(0),$$

where $\bar{e}$ denotes the highest emission level for which the participant reported an uncensored WTM. We regress the concave-WTM dummy on Δ_{CU} and find that there is no statistically significant correlation between the two variables ($t(1082) = -0.431$, 95% CI

$[-0.004, 0.003]$, two-sided $p = 0.666$).[3]

Based on these two analyses, we conclude that there is insufficient support for the idea that cognitive uncertainty is a driver of concavity in the WTM curve.

Concave moral valuations. Another potential psychological channel that may explain a concave WTM relates to concave moral judgments. Individuals might perceive emitting 4kg of CO_2 as considerably morally worse than emitting 0kg, while the moral distinction between emitting 4kg and emitting 20kg might seem relatively minor. Such concave moral evaluations might, in turn, influence and shape the participants' WTM.

Let $\mu_j(e, k) \in \{1, 2, \ldots, 7\}$ denote the moral evaluation assigned by participant j to emitting $e$kg of CO_2 in exchange for £k, where the range spans from "morally very appropriate" (1) to "morally very inappropriate" (7). These evaluations are collected for each $e \in 4, 12, 20$ and $k \in 1, 5$. We aggregate these moral judgments by computing their average over the two values of k, yielding $m_j(e) = (\mu_j(e, 1) + \mu_j(e, 5))/2$. This composite measure is labelled as "Morality." Finally, we compute the variable ϕ_j as:

$$\phi_j = m_j(12) - \frac{m_j(4) + m_j(20)}{2}.$$

A positive value of ϕ_j indicates that the moral valuation of participant j is concave. The average ϕ is 0.107, which is positive and statistically significant ($t(1504) = 7.08$, 95% CI $[0.078, 0.137]$, two-sided $p < 0.001$), suggesting that moral judgments are indeed concave.

To investigate whether the presence of concave moral valuations is linked to a concave WTM, we regress the "concavity" dummy, which is equal to 1 if a participant exhibits a concave WTM, on the variable ϕ_j. The results presented in Supplementary Table 6 indicate that concavity in moral valuations has limited predictive power regarding the concavity of WTM.

A proposed interpretation based on the questions frame. We propose that the concavity of the WTM data reflects decreasing marginal disutility from emitting CO_2—emissions perceived as losses— rather than decreasing marginal utility from offsets, which are viewed as gains. This argument relies on the framing of our WTM questions.

In the WTM elicitation, participants are presented with a choice between "Option A", which entails no emissions and no monetary pay-off, and "Option B", which entails positive emissions and a monetary bonus. The reference point consists of no emissions. Participants were informed that emissions would be implemented as follows: 1) we set

[3]We follow the classification of individual WTM curve discussed in Section A.2.2. Note that the concave-WTM is a dummy variable taking a value of 1 when the WTM curve is characterized as either "concave" or "concave†" in the classification. In this analysis, we excluded participants whose WTM curves were classified as decreasing or non-monotonic. Additionally, participants with only an uncensored WTM value at $e = 0$ were also excluded, as Δ_{CU} is undefined for this subgroup.

Supplementary Table 6: Concavity of WTM and morality.

	(1)	(2)	(3)	(4)
Concavity of moral judgment (ϕ)	0.022	0.020	0.016	0.045
	(0.020)	(0.020)	(0.021)	(0.026)
Constant	0.212	0.202	0.233	0.153
	(0.121)	(0.125)	(0.128)	(0.143)
Controls	Yes	Yes	Yes	Yes
Observations	1,504	1,430	1,373	1,100
R^2	0.040	0.040	0.042	0.040

Notes: The dependent variable is `concave`, a dummy taking a value of 1 if the WTM curve is either "concave" or "concave†" based on the classification discussed in Section A.2.2. Samples are increasingly restrictive, from left to right. Column (1) includes all participants. Column (2) excludes participants who failed the attention check embedded in the moral judgment elicitation. Column (3) excludes participants whose $m_j(e)$ are decreasing in e. Column (4) excludes participants whose WTM curve is either decreasing or non-monotonic. List of control variables common to all regressions: age, gender (male, female, other), political affiliation (5 categories), education (6 categories), income (7 categories), and time needed to complete the first real effort task. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

aside a portion of the funds to be donated to Carbonfund.org, but 2) we would reduce the donation if they chose Option B. This procedure establishes the default as the donation to go through, with participants having the option to deviate from this default by choosing Option B. Moreover, the instructions asked the participants to indicate "the minimum bonus you require to accept the CO_2 emissions".

The questions are framed similarly to Willingness To Accept (WTA) elicitations, which ask participants to indicate the compensation required to engage in something they dislike—in our case, allowing the emission of CO_2. Given this framing, the concavity observed in our WTM data suggests that individuals have a marginally decreasing disutility from emitting CO_2: their aversion to emissions increases less at a rate less than proportional to the size of emission. This marginally decreasing disutility is surprising given that most economic models assume convex utility functions in losses.

The preceding discussion raises concerns regarding whether the concavity of WTM is driven by the way we ask the questions. Recent evidence, however, suggests this is not the case. Rodemeier (2023) successfully replicates the concavity result using a Willingness To Pay (WTP) framework, which asks individuals how much they are willing to pay out of their own pocket to offset emissions. In a WTP framework, offsets are considered as gains. The fact that the WTM exhibits concavity in both the loss and the gain domains suggests that decisions regarding emissions should be modelled with a reference-dependent model characterized by increasing insensitivities as outcomes move away from the reference point.

A.3 Study 3: Motivated Belief Experiment

A.3.1 Demographic characteristics

Supplementary Table 7: Demographic characteristics.

			Treatment		
		All	*Motivated*	*Unmotivated*	
Age bracket					
18-27	371	0.530	0.536	0.522	$\chi^2(4) = 2.64$
28-37	207	0.296	0.308	0.279	$p = 0.620$
38-47	67	0.096	0.084	0.111	
48-57	40	0.057	0.055	0.061	
58+	15	0.021	0.017	0.027	
Gender					
Male	354	0.496	0.493	0.502	$\chi^2(1) = 0.03$
Female	359	0.504	0.507	0.498	$p = 0.872$
Student					
No	417	0.590	0.587	0.593	$\chi^2(1) = 0.01$
Yes	290	0.410	0.413	0.407	$p = 0.932$
Education					
Less than high school	17	0.024	0.022	0.027	$\chi^2(4) = 0.24$
High school	190	0.273	0.274	0.270	$p = 0.993$
Some University	145	0.208	0.204	0.213	
Bachelor	231	0.331	0.334	0.328	
Postgraduate	114	0.164	0.165	0.162	
Income					
- £5,000	44	0.069	0.075	0.062	$\chi^2(8) = 3.88$
£5,000 - £15,000	146	0.230	0.232	0.228	$p = 0.868$
£15,000 - £30,000	183	0.289	0.290	0.287	
£30,000 - £45,000	103	0.162	0.149	0.180	
£45,000 - £60,000	77	0.121	0.130	0.110	
£60,000 - £75,000	48	0.076	0.066	0.088	
£75,000 - £90,000	22	0.035	0.036	0.033	
£90,000 - £105,000	7	0.011	0.014	0.007	
£105,000 -	4	0.006	0.008	0.004	

Notes: The table includes observations from the *Motivated* and the *Unmotivated* treatment ($N = 714$). Missing observations: 14 in age bracket, 1 in gender, 7 in student, 1 in education, 73 in income.

A.3.2 Dwell time in the attention task

In this analysis, we investigate whether the *Motivated* treatment has any impact on the time subjects spend completing the attention task. This variable is of particular importance because recent findings in economics and neuroscience suggest that dwell time on a piece of information causally increases the weight given to that information in subsequent decisions (Pärnamets et al., 2015; Amasino, Pace and van der Weele, 2021; Engelmann, Hirmas and van der Weele, 2021).

In the context of our study, we observed no substantial differences between the *Motivated* and *Unmotivated* treatments. If anything, the participants in the *Motivated* treatment tended to spend more time on the attention task. As shown in column (1) of Supplementary Table 8, in which we regress the time the participants spent on the task (in seconds) on a dummy for the *Motivated* treatment and on demographic controls, we observe that in the *Motivated* treatment spend 1.6 seconds more on the task. However, this difference is not statistically significant ($t(655) = 0.53$, 95% CI $[-4.29, 7.47]$, two-sided $p = 0.595$).

Column (2) confirms this finding, focusing solely on the 91% of participants who completed the task in less than 70 seconds. This subset represents individuals for whom we can be most confident that they did not take any breaks between receiving the information and providing their responses (the information was displayed for up to 60 seconds).

Supplementary Table 8: Time spent on the attention task.

	(1)	(2)
Motivated treatment	1.593	0.082
	(2.994)	(1.508)
Controls	Yes	Yes
Observations	694	632
R^2	0.067	0.079

Notes: The models are linear regressions with dependent variable the seconds the participants spent on the attention task. The models include the observations from the *Motivated* and the *Unmotivated* treatment with the *Unmotivated* as the baseline. The first column includes all the participants for which we recorded the demographic data, except one for which the program did not record the time spent on the task. The second column only includes the participants who spent less than 70 seconds to complete the attention task. Control variables: sex, age, student status, education (6 categories), frequency of car usage (5 categories), nationality (27 categories). Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

A.4 Robustness Checks

A.4.1 Subsample by the level of understanding

Supplementary Tables 9 (for the Risk Aversion experiment) and 10 (for the Motivated Belief experiment) demonstrate the robustness of the null result even when excluding participants who made mistakes in the comprehension questions.

Supplementary Table 9: Effect of uncertainty on getting the computer code (Risk Aversion experiment).

	(1)	(2)	(3)	(4)
Information treatment	−0.005	0.005	−0.004	−0.004
	(0.036)	(0.027)	(0.025)	(0.024)
Constant	0.538*	0.576***	0.587***	0.550***
	(0.213)	(0.148)	(0.131)	(0.130)
# Mistakes	0	≤3	≤6	≤12
Controls	Yes	Yes	Yes	Yes
Observations	668	1,221	1,364	1,460
R^2	0.089	0.060	0.054	0.054

Notes: All models are linear regressions with dependent variable `product_bought`: an indicator variable equal to 1 if the participant bought the computer product. Models include the observations from the *Information* and the *Uncertainty* treatments of the Risk Aversion experiment. The *Uncertainty* treatment is the baseline. Column (1): participants who made no mistakes in the comprehension questions. Column (2): participants who made 3 or fewer mistakes. Column (3): participants who made 6 or fewer mistakes. Column (4): participants who made 12 or fewer mistakes. Control variables: gender (male, female, other), age, education (5 categories), political identification (5 categories), income (9 categories), time needed to complete the real effort task. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

Supplementary Table 10: Effect of the *Motivated* treatment on purchasing and beliefs (Motivated Belief experiment).

A: Units	(1)	(2)	(3)	(4)
Motivated treatment	0.073	0.020	0.031	0.034
	(0.060)	(0.041)	(0.039)	(0.038)
# Mistakes	0	≤3	≤6	≤12
Controls	Yes	Yes	Yes	Yes
Observations	324	579	635	670
R^2	0.119	0.108	0.101	0.099
B: Beliefs	(1)	(2)	(3)	(4)
Motivated treatment	2.284	3.179	3.124	2.727
	(4.715)	(3.550)	(3.378)	(3.277)
# Mistakes	0	≤3	≤6	≤12
Controls	Yes	Yes	Yes	Yes
Observations	324	579	635	670
R^2	0.110	0.049	0.048	0.049

Notes: All the models are linear regressions. Dependent variable: (A) a dummy variable equal to 1 if the participant bought the virtual product, (B) beliefs about the size of the CO_2 emissions associated with the virtual product. The models include the observations from the *Motivated* and the *Unmotivated* treatment. The *Unmotivated* treatment is the baseline. Column (1): participants who made no mistakes in the comprehension questions. Column (2): participants who made 3 or fewer mistakes. Column (3): participants who made 6 or fewer mistakes. Column (4): participants who made 12 or fewer mistakes. Control variables: sex, age, student status, education (6 categories), frequency of car usage (5 categories), nationality (27 categories). Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

A.4.2 Subsample by the level of trust

Supplementary Table 11 presents the results after excluding participants who expressed scepticism about our commitment to actually paying for the CO_2 offsets. The null results remain consistent in this robustness check.

Supplementary Table 11: The effect of trust in researchers.

	Risk Aversion	Motivated Belief	
	(1) Purchase	(2) Purchase	(3) Belief
Information treatment	−0.005		
	(0.027)		
Motivated treatment		0.028	2.552
		(0.041)	(3.523)
Controls	Yes	Yes	Yes
Observations	1,217	579	579
R^2	0.056	0.112	0.053

Notes: All models are linear regressions. Dependent variables: in column (1), an indicator variable equal to 1 if the participant bought the computer product; in column (2), an indicator variable equal to 1 if the participant bought the virtual product; in column (3), beliefs about the size of the CO_2 emissions associated with the virtual product. The first column includes the observations from the *Information* and the *Uncertainty* treatments of the Risk Aversion experiment. The second and third columns include the observations from the *Motivated* and the *Unmotivated* treatment from the Motivated Beliefs experiment. The *Unmotivated* treatment is the baseline. The *Uncertainty* treatment is the baseline. In all columns we exclude the participants who indicated low level of trust towards the CO_2 offsets taking place are excluded from this analysis. In the Risk Aversion experiment, these are the participants that answered with a 1, 2, or 3 to the question: "Do you trust that the researchers will indeed buy CO_2 offsets as described in the instructions?". Where 1 means "not at all" and 5 means "completely". In the Motivated Beliefs experiment these are the subjects that answered "No" rather than "Yes" to the same question. Control variables in column (1): gender (male, female, other), age, education (5 categories), political identification (5 categories), income (9 categories), time needed to complete the real effort task. Control variables in columns (2) and (3): sex, age, student status, education (6 categories), frequency of car usage (5 categories), nationality (27 categories). Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

B Experimental Materials

B.1 Belief Elicitation in Study 1

Point estimates of the emission sizes. When asking about the CO_2 emissions generated by driving, we allowed the participants to express their guesses either in ounces or grams so they could use the more familiar unit of measure (Supplementary Figure 3).

For all the other products, we elicited the point estimates on a single interface that allowed the participants to go back and modify their previous answers easily. The order of the products on the interface was randomized at the individual level.

The 12 questions were graphically displayed (Supplementary Figure 4). The product in each question was represented by clip art, below which the name of the product and its size appeared. The participants could see which emissions were taken into account by the scientific estimate by hovering the mouse cursor on an info icon shown above each question. The list of products, their amount, and the emissions to be considered were all described in the instructions as well.

The participants' answers were summarized in an interactive box displayed at the bottom of the page. The box appeared as soon as a participant filled in the first question on the screen and it stayed visible until the moment the participant confirmed her answers. The "Confirm" button appeared inside the summary box to draw the participant's attention to the box itself.

The summary box graphically showed a participant's guesses on a line. Crucially, we designed the line to avoid any anchoring effects. No number appeared on it if the participant had not entered any guesses. Moreover, the scale of the line adjusted dynamically depending on the highest guess.

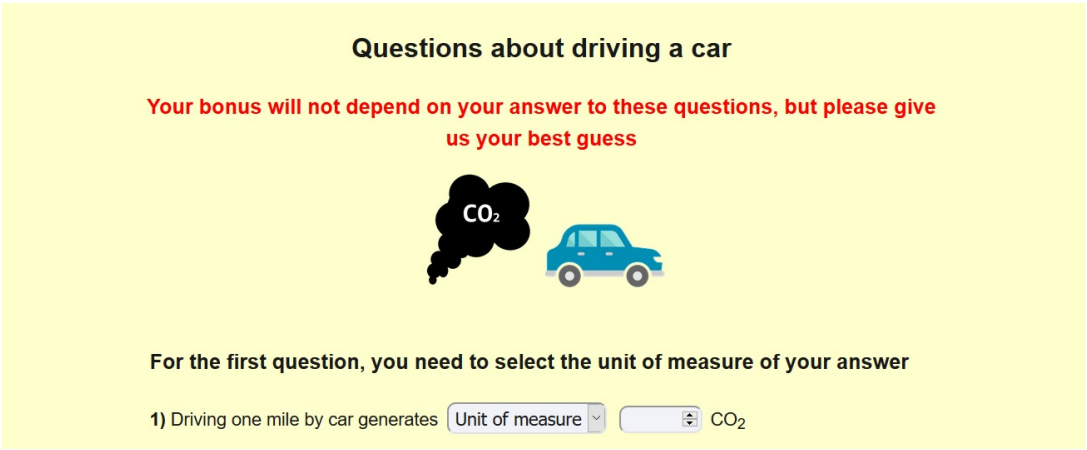
Belief distribution. The elicitation interface showed the name and the quantity of the product and reminded the participants of their point estimates. The participants could see which emissions were taken into account by the scientific estimate by hovering the mouse cursor on an info icon.

The interface displayed five bins for each question (Supplementary Figure 5). The participant's point estimate for the product, call it m, was taken as the midpoint of the central bin. The central bin covers numbers from $0.95m$ to $1.05m$. The two bins on both sides of the central bin cover numbers from $0.85m$ to $0.95m$ and from $1.05m$ to $1.15m$. Finally, the farthest two bins cover numbers below $0.85m$ and above $1.15m$, respectively.

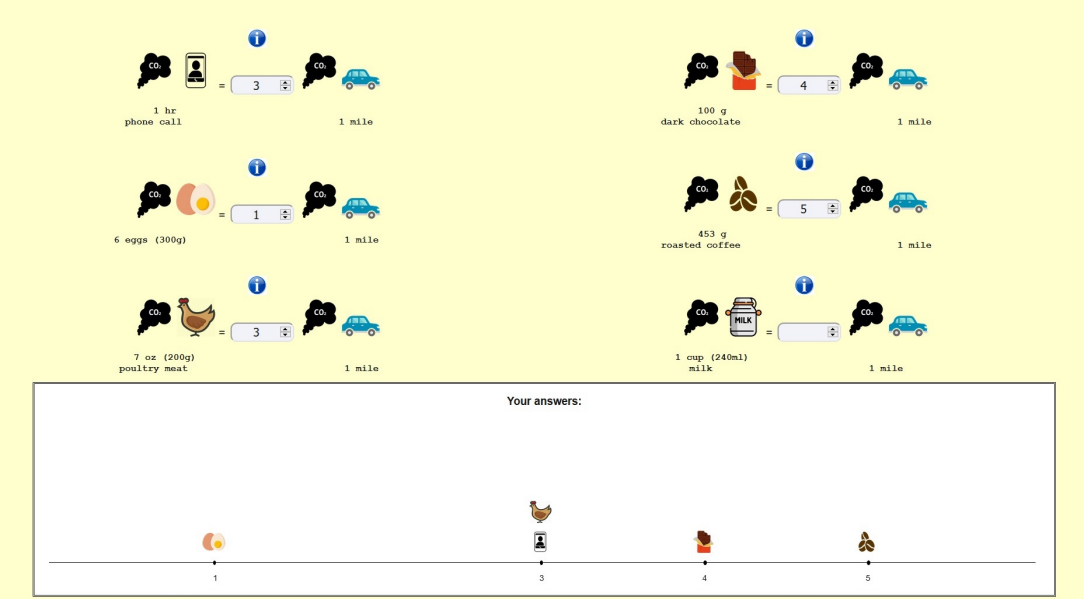
The interface showed a box containing the 20 balls the participants had to allocate among the bins. The participants could move the balls to a bin by (i) moving a slider below the bin, (ii) directly typing the number of balls they wanted to move in a text field below the bin, or (iii) clicking on the arrows next to the text field. The participants could move all the balls back to the box by pressing the button "Reset".

Supplementary Table 12: Comments on the calculation of CO_2 emissions.

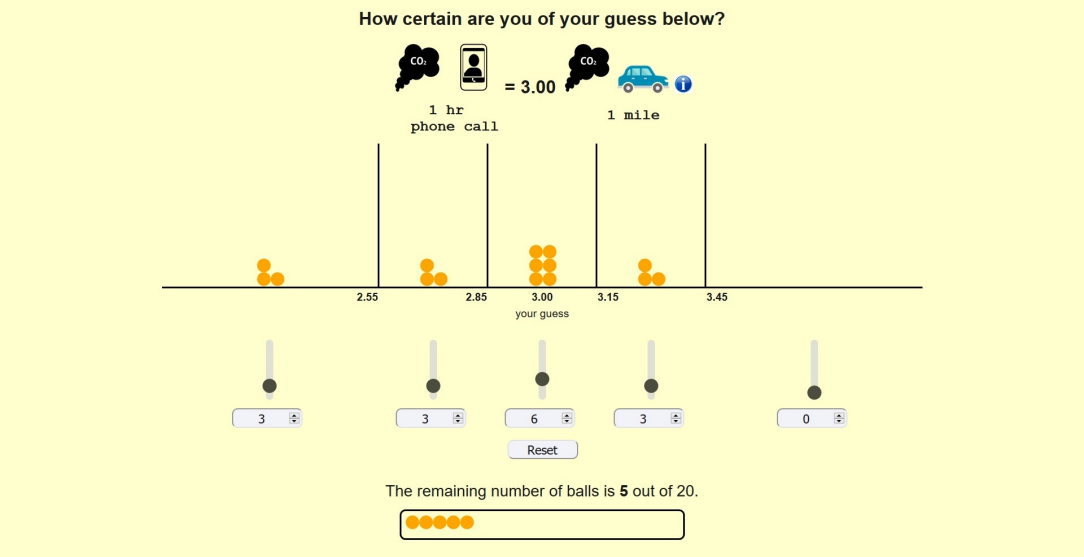
Product	Comment
Beer	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Phone call	It takes into account the CO_2 emissions generated to operate the phone and the communication network.
Microwave	It takes into account only the emissions generated by the power plants that produce the energy used by the microwave.
Milk	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Egg	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Poultry meat	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Shower	It takes into account the emissions generated by warming up the water and all the emissions connected to the water delivery and cleaning.
Chocolate	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Coffee	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Beef	It takes into account all the emissions, starting with the production and ending with the distribution of the products to the consumer.
Flight	It takes into account only the emissions generated by burning the plane fuel.
Gas heating	It is the average of the estimates of 10 different carbon footprint calculators.



Supplementary Figure 3: Beliefs about CO_2 emissions from driving one mile by car.



Supplementary Figure 4: Beliefs about CO_2 emissions from consumer products and activities.



Supplementary Figure 5: Belief distribution.

B.2 Work Task in Study 2

The task involved typing 15 strings, each consisting of 15 characters, in reverse order. The participants were required to transcribe these strings flawlessly to complete the task: any mistakes incurred resulted in an error message indicating the specific strings that required correction before they could proceed with the experiment. Participants saw a warning sign ATTENTION CHECK every 30 seconds, and upon its appearance, they had a 5-second window to click the I AM HERE button to confirm their active engagement with the task (right panel in Supplementary Figure 6). The participants knew that they would be excluded from the experiment if they failed more than 4 of these attention checks.

Supplementary Figure 6: Work task.

B.3 Attention Task in Study 3

The task involved finding the most frequently appearing number in a matrix of numbers. The matrix contained a total of 143 numbers, drawn from the set $\{0, 20, 40, 60, 80, 100, 120\}$ (Supplementary Figure 7). The number 60, the most frequently occurring, appeared 35 times, with 0 and 120 being the next most frequent, each appearing 26 times. All other numbers appeared 14 times each. Participants earned £0.10 if they answered 60.

0	40	60	120	0	120	100	60	60	0	120
40	20	120	120	60	80	80	20	20	60	120
0	0	0	80	100	20	60	60	20	20	40
40	0	120	60	100	100	80	80	60	60	60
120	120	0	100	20	0	60	0	20	100	60
100	80	0	60	120	120	60	40	60	80	20
0	0	40	0	0	60	120	60	60	100	40
120	60	80	120	80	120	60	40	0	60	120
60	0	60	100	60	120	20	100	40	0	80
60	60	60	120	60	0	120	40	0	60	120
120	20	0	40	120	100	0	60	100	20	60
0	40	120	60	0	120	20	80	40	60	60
80	100	80	20	80	100	120	0	40	0	120

Supplementary Figure 7: The matrix of numbers presented in the attention task.

B.4 Measures to Assure Data Quality

Instructions and comprehension questions. To ensure a comprehensive understanding of the essential elements of the instructions by our experimental subjects, we created slides that presented the information step by step. Most of the slides were accompanied by explanatory images to facilitate a more intuitive comprehension of the instructions. Furthermore, we organized the instructions into several sets. Following the completion of each set, participants were required to answer a series of comprehension questions. Importantly, we did not allow subjects to proceed with the experiment until they had successfully answered all questions in a given set. In total, participants were required to answer 7 questions related to the beliefs elicitation in Study 1, 19 questions (5 of which concern the work task and the computer code) in Study 2 and 15 in the *Motivated* and *Unmotivated* treatments in Study 3.

How we made sure that no bot completed the study. Our design incorporates two elements that mitigate the risk of an automated script ("bot") completing our experiment. Firstly, our instructions are not machine-readable. As a result, a computer script would need to provide random answers to the comprehension questions, leading to an exceptionally high number of answer attempts. This is further exacerbated by several comprehension questions requiring participants to input precise numerical values. We kept track of the number of attempts. In the Risk Aversion experiment, none of the participants who reached the end of the experiment needed more than 50 attempts to answer the comprehension questions, and 95% of them needed less than 22 attempts (the minimum number of attempts was 10). In the Motivated Belief experiment, no participant needed more than 65 attempts and 95% less than 14 attempts (the minimum number of attempts was 3).

Secondly, we incorporated three "honey-pots" within our two experiments. Those are questions hidden from human participants but discernible to a bot that reads the source code of the experimental program and identifies them as questions to be answered. We considered answering either honey-pot as sufficient evidence that the participant is a bot. We found no participant who answered these two "hidden" questions.

Combining the evidence from the number of attempts and the honey-pots, we can confidently conclude that no bot completed our experiment.

B.5 Invoice

Carbonfund.org
REDUCE WHAT YOU CAN OFFSET WHAT YOU CAN'T

Invoice 10622 for order 38268

Order Date: May 14, 2019

Billing Address

Davide Pace
Roetersstraat 11
1018WB Amsterdam
Netherlands

Shipping Address

Davide Pace
Roetersstraat 11
1018WB Amsterdam
Netherlands

Shipping Method

No shipping

SKU	Product	Quantity	Price
general-donation	General Donation **Name for e-certificate(s):** Davide Pace on behalf of the University of Amsterdam	1	$911.40
		Subtotal:	$911.40
		Payment Method:	Credit Card
		Total:	$911.40

Customer Details

- **Email:** d.d.pace@uva.nl

> *This donation is the result of participants decisions in the experiments "Decision Making 6-13" of the University of Amsterdam*

B.6 Preregistrations

ASPREDICTED

Wharton CREDIBILITY LAB
UNIVERSITY of PENNSYLVANIA

CONFIDENTIAL - FOR PEER-REVIEW ONLY

Curbing carbon: Does information about climate impact reduce emissions? (#109190)

Created: 10/11/2022 07:59 AM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.
A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

---

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
We have two main research questions.
1) Does quantitative information about CO2 emission reduce the acquisition of an emission-intensive product?
2) If so, is the effect of information explained by the declining marginal willingness to pay for mitigating CO2 emissions?

3) Describe the key dependent variable(s) specifying how they will be measured.
Participants can buy a product that results in an uncertain amount of CO2 emissions. The key dependent variable is the consumption of the product (1: if the participant buys; 0: otherwise). In addition, we elicit willingness to pay to mitigate (WTM) CO2 emissions of various sizes, to explain the reaction to information (see below). For each emission size, we elicit WTM twice to rule out measurement error (see point 8).

4) How many and which conditions will participants be assigned to?
There are 2 conditions. Each participant will participate in one condition.

Info Treatment: participants know exactly the size of the CO2 emissions of the product (4 kg).
Uncertainty Treatment: participants know CO2 emissions associated with the product are 0 kg with a probability of 0.4, 4 kg with a probability of 0.2, or 8 kg with a probability of 0.4.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
Hypothesis 1: Participants in the Info treatment buy fewer units of the good than participants in the Uncertainty treatment.
We test this hypothesis by means of a Fisher's exact test. We will also perform OLS regressions to control for subject characteristics.

Hypothesis 2: The effect of information increases with higher concavity of WTM (declining marginal willingness to mitigate).
For each individual, we compute a measure of concavity as the WTM 4 kg of CO2 emissions minus the average of the WTM 0 kg and 8 kg. We then regress the buying decision on the Info treatment dummy, our concavity measure, and the interaction of this concavity measure and the Info treatment dummy. In the regression, we control for subject characteristics and the average WTM across all three relevant levels. For this analysis, we exclude subjects whose WTM is top censored for at least one emission amount in the interval [0kg; 8kg] and whose WTM to mitigate is not weakly increasing, i.e., who don't satisfy the law of demand.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
We exclude observations only if we have evidence that the respondent is not a human (we will run the experiment online). In addition, we will run robustness checks where we exclude participants who indicate that they don't believe we will actually implement the CO2 emissions.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We will collect 1500 complete observations on prolific. The sample size in the analysis might be larger because we will include subjects who have completed the demographic questionnaire but have not finished the experiment.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
We will provide various robustness checks. First, we will do robustness using an alternative specification of the concavity measure, dividing our original measure by (WTM(8 kg) - WTM(0 kg))/2 to correct for the increase in the WTM. We will also look at the treatment differences for the subsets of participants whose willingness to mitigate is more or less concave than the median.
Second, to combat measurement error in our concavity measure, we will do a second, unincentivized elicitation of WTM. Following the approach in Gillen et al. (Journal of Political Economy, 2019) we will instrument one measure with the other to eliminate any variation that is not common to both measures.

Taxes, beliefs, and the demand for goods with negative externalities (#23181)

Created: 05/08/2019 05:11 AM (PT)
Shared: 07/10/2019 06:08 AM (PT)

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Policy-makers have two main instruments to change consumer demand for goods that produce a negative externality. They can change the price using taxes and subsidies, or they can provide information about the externality. We have three main research questions
1) What is the effect of prices and information on consumption?
2) Do higher prices and information reduce self-serving beliefs about the externality?
3) Does information reduce the effect of price policies by eliminating self-serving beliefs?

3) Describe the key dependent variable(s) specifying how they will be measured.
Participants can buy a good that results in an uncertain externality (CO_2 emissions). Thus, the two key dependent variables are:
1) Consumption: this is a binary variable (1: if the participant buys the good; 0: otherwise),
2) Beliefs: this is an integer between 0 and 120. It represents participants' beliefs about the magnitude of the externality they may produce (measured as the equivalent of liters of gasoline).

4) How many and which conditions will participants be assigned to?
Three treatments differ in the way participants are informed about the size of the externality:
Info Treatment: participants know exactly the size of the externality.
Motivated Treatment: The answer to a puzzle gives participants the magnitude of the externality. Participants solve the puzzle after knowing the relation with the externality.
Unmotivated Treatment: The answer to a puzzle indicates to participants the magnitude of the externality. Participants solve the puzzle before knowing the relation with the externality

In three cross-cutting conditions, we vary the price of the good in the set {0.25, 1, 1.75}, measured in British pounds.

Overall, this leads to 9 conditions, all subjects participate only in one condition.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
Hypothesis 1: Participants in the Info treatment buy fewer units of the good than participants in the Motivated treatment.

We test this hypothesis by means of a Fisher's exact test, pooling all price levels. We will perform regressions to control for subject characteristics.

Hypothesis 2: Participants in the Unmotivated treatment have higher beliefs and buy fewer units of the good than participants in the Motivated treatment.

We compare this with a non-parametric rank sum test (beliefs) and Fisther exact test (consumption), pooling all price levels. We will perform regressions to control for subject characteristics.

Hypothesis 3: In the Motivated treatment, demand is decreasing in prices.

We test this in a linear regression, using a one-sided t-test.

Hypothesis 4: In the Motivated treatment, beliefs are increasing in prices.

We test hypothesis using a linear regression and a one-sided t-test.

Hypothesis 5: Conditional on hypothesis 4 being confirmed, price-sensitivity of demand in the Info treatment is lower than that in the Motivated treatment.

We test this in a linear probability model, using a one sided t-test. Note that if the relationship between beliefs and prices is different than in

C Instructions for the studies

C.1 Study 1: Survey about Subjective Uncertainty

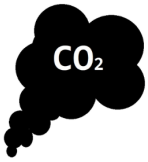
This section contains all the instructions of the survey till the end of the beliefs elicitation.

C.1.1 Session 1: Introduction

Welcome!

UNIVERSITY OF AMSTERDAM

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN



In the study, we will mainly ask you questions related to climate change and CO_2 emissions.

For this study, it is important that for every question you give us your best guess without asking anyone else or using any other form of help.

This study runs over two days:

- **Today**: Session 1 - **65 minutes** survey
- **16th December**: Session 2 - **25 minutes** survey

The total reward for this study is **£10.00 (~$13.10)**

In addition, you can win a **bonus** worth several pounds

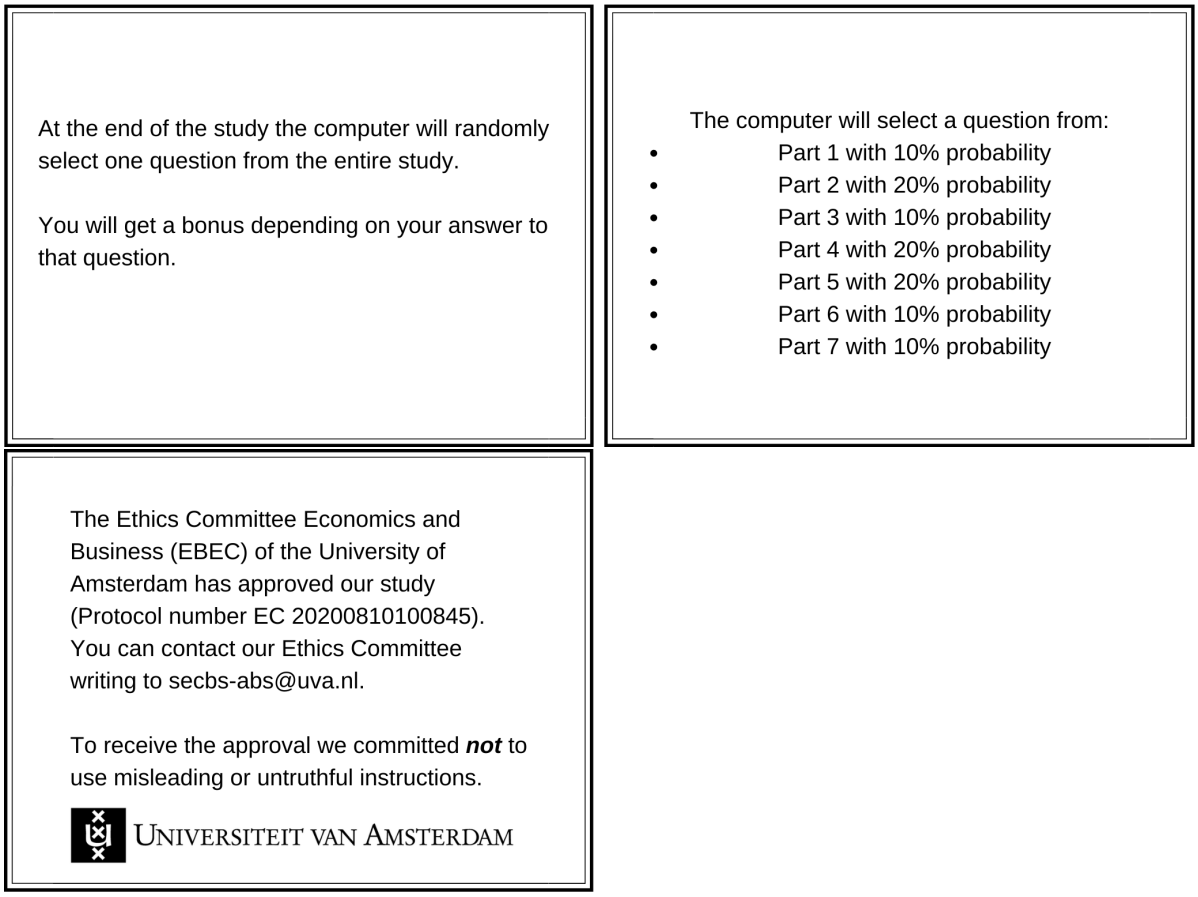
We will **approve** your submission only if you complete the surveys on both days.

You **must** complete Session 2 **between Wednesday 16th December** at 12 noon ET (11.00 am CT, 10.00 am MT, 9.00 am PT) and Thursday **17th December** 3.00 pm ET (2.00 pm MT, 1.00 pm MT, 12 noon PT).

We will send you a reminder on Prolific when Session 2 is open.

Today you will complete parts 1, 2, 3, 4 of the study and a questionnaire.
In Session 2, you will complete parts 5, 6, and 7.

In each part, you will make some decisions or answer questions.



Comprehension questions

1. You will be paid only if you conclude all the parts of this study. The study has two sessions.
   True; False

2. At the end of the study, the computer will randomly select one question. You will receive a bonus depending on your answer to this question.
   True; False

3. For this study, it does not matter if you ask for help to answer the questions.
   True; False

4. According to the ethical protocol under which we run this study, all the instructions you read must be truthful and not misleading.
   True; False

C.1.2 Part 1

Part 1

Scientific studies have investigated the causes and the effects of climate change. In particular they estimated:

- The global warming from pre-industrial era.
- The consequences of a 2°C global warming for humans.
- The CO_2 generated by several human activities.

The most important measure of the future consequences of emitting a given amount of CO_2 today is called the **social cost of carbon**.

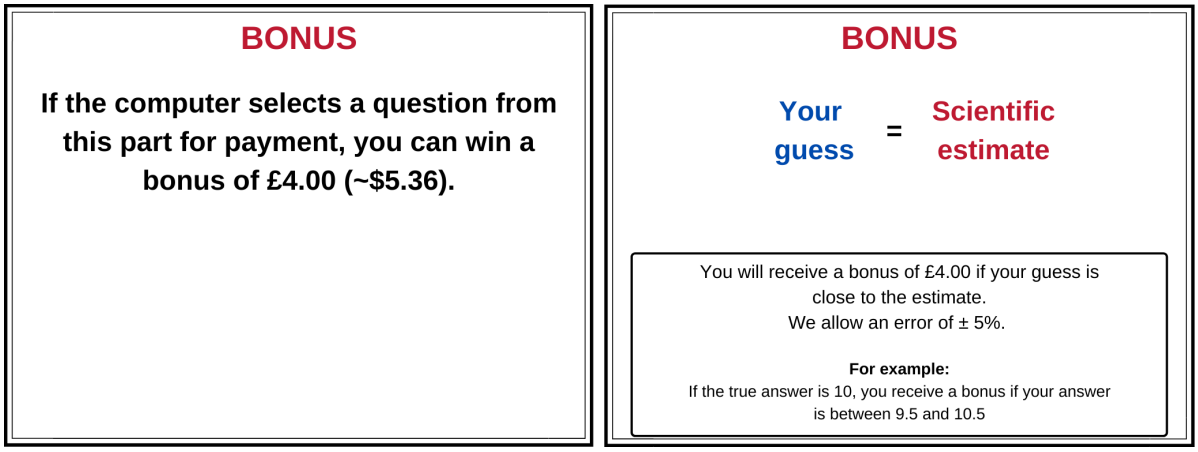
The social cost of carbon puts a dollar value on the fact that:

- CO_2 emissions have an impact on the earth's climate and they lead to rises in sea levels, changes in rainfall patterns, a higher frequency of extreme weather events etc. All these events affect human health and productivity.
- CO_2 emissions imply a hidden cost: emitting CO_2 today requires reducing consumption tomorrow to avoid a global warming of more than 2°C.

In Part 1, we will ask you to guess the value of several scientific estimates.

Your guess ⟷ **Scientific estimate**

We will compare your guess to the scientific estimate.



Comprehension questions

1. The social cost of CO_2 emissions is due both to the consequences of climate change and to the cost of reducing consumption in the future to avoid global warming of more than 2°C.
   True; False

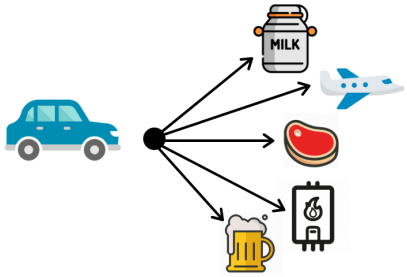
2. If one of the questions from Part 1 is selected for payment, you can win a bonus of £ [ ].

3. If one of the questions from Part 1 is selected for payment, you will win the bonus:
   Only if your answer is below the scientific estimate.; Only if your answer is above the scientific estimate.; Only if your answer is equal to the scientific estimate with an error of no more than ±5%.; Only if your answer is exactly equal to the scientific estimate.

C.1.3 Part 2

Part 2

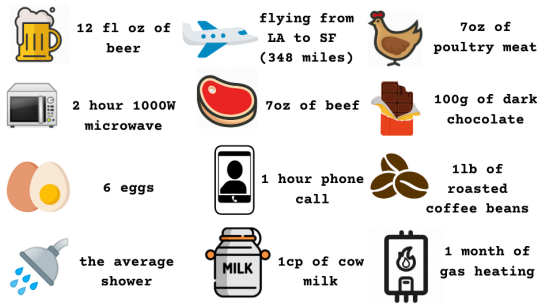
Scientists and governments estimated the CO_2 emissions of other products and actions as well



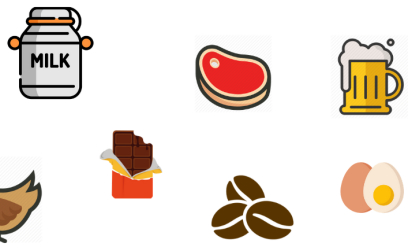
We will now ask you to compare the CO_2 emissions generated by other products with the emissions generated by driving a car.

Example question:

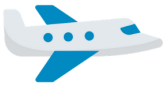
For example, you are asked to fill the blank space with the number of miles you need to drive to produce as much CO_2 as the average shower.



Here is the complete list of the 12 products we will use in this study.



For the products above the scientific estimates take into account all the emissions starting with the production and ending with the distribution of the products to the consumer.



For the flight the scientific estimate takes into account only the emissions generated by burning the plane fuel.

For the gas heating the scientific estimate is the average of the estimates of 10 different carbon footprint calculators.

For the microwave the scientific estimate takes into account only the emissions generated by the power plants that produce the energy used by the microwave.

For the shower the scientific estimate takes into account the emissions generated by warming up the water and all the emissions connected to the water delivery and cleaning.

For the phone call the scientific estimate takes into account the CO_2 emissions generated to operate the phone and the communication network.

BONUS

If the computer selects a question from this part for payment:

You can win a bonus of £4 (~$5.36)

Your guess ⟷ **Scientific estimate**

As in Part 1:
We will compare your guess to a scientific estimate.

Your guess = **Scientific estimate**

As in Part 1:
You will receive a bonus of £4.00 if your guess is close to the estimate.
We allow an error of ± 5%.

Comprehension questions

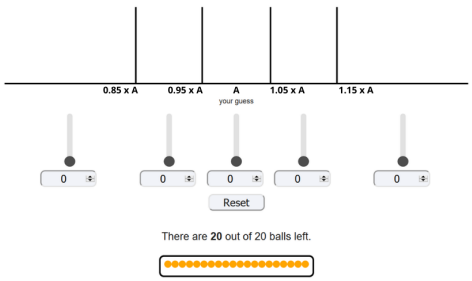
1. In this part, you need to compare the emissions produced by several actions with the emissions produced by driving 1 mile by car.
   True; False

2. You will need to compare the emissions of a flight from New York to Chicago with the emissions of driving a car.
   True; False

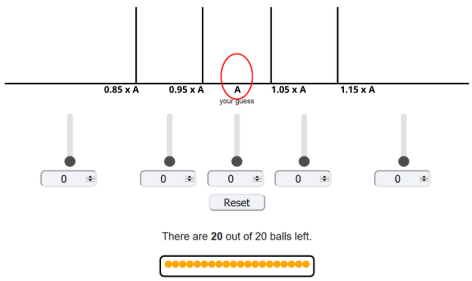
C.1.4 Part 3

Part 3

We will now ask you how certain you are about your guesses in Part 1 and Part 2

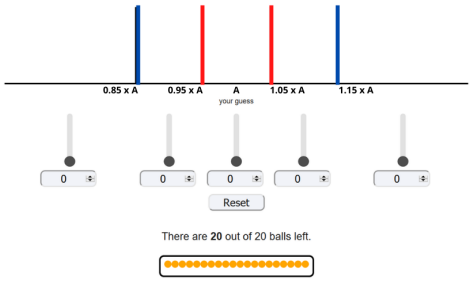


For each of your guesses in Parts 1 and 2, you will see an interface like the one above.

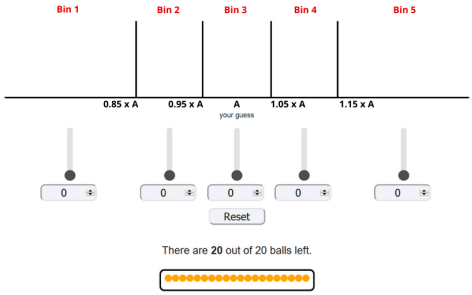


The point in the middle corresponds to your guess in Part 1 or Part 2.

Here we indicate your guess with "A". In the actual question you will see the number you stated as your guess instead of "A".



The two **red lines** represent your guess ± 5%
The two **blue lines** represent your guess ± 15%



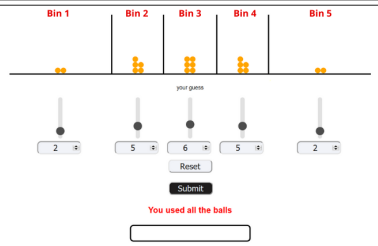
Hence, the interface is divided into 5 bins.
You have to distribute 20 balls between these 5 bins.

The number of balls you place in a bin expresses the chances with which you think the scientific estimate falls into that bin.

So, the more likely you think it is that the scientific estimate falls into a particular bin, the more balls you should place into that bin.

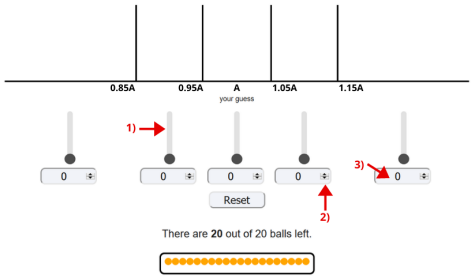
If you are really certain of your original guess, then you should put many balls into the central bin.

If you are rather uncertain and think that the true estimate could take any number of values, then you should distribute the balls between bins more evenly.



In the example above a participant indicated that the chance that the estimate falls into

- Bin 1 is 2 out of 20
- Bin 2 is 5 out of 20
- Bin 3 is 6 out of 20
- Bin 4 is 5 out of 20
- Bin 5 is 2 out of 20



To distribute the balls you can 1) move the sliders, 2) use the arrows, and 3) type numbers in the boxes.

BONUS

You can win a bonus of £6 (~$8.04) if the computer selects a question from this part for payment

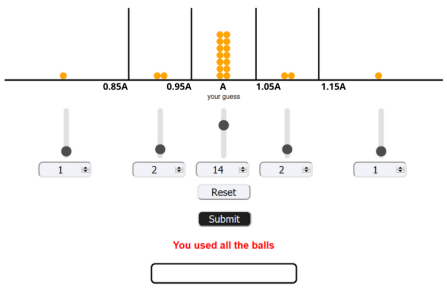
BONUS

The payment mechanism is such that you have the highest chance to win the bonus if the distribution of balls reflects **your level of certainty**.

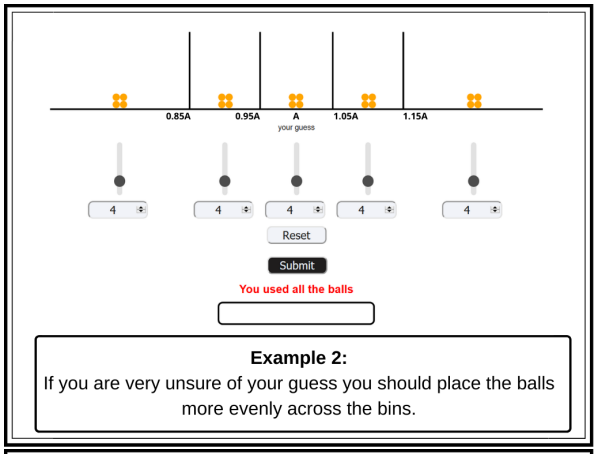
That means that the number of balls in each bin should reflect the likelihood that the bin contains the scientific estimate.

If you want more information about the payment mechanism, click on the link below this slide

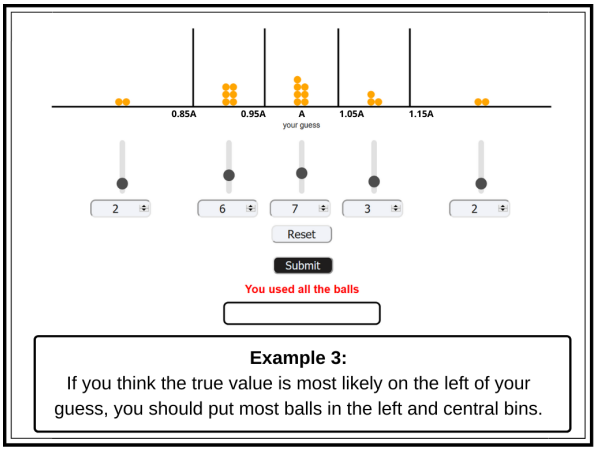
We now illustrate how you can express your level of certainty with a number of examples.



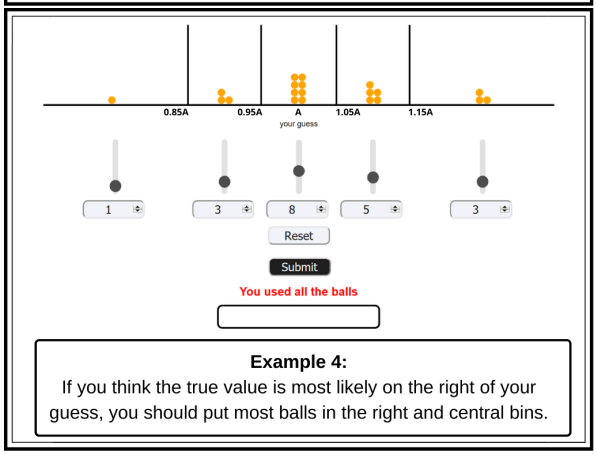
Example 1:
If you are very sure of your guess, then you should place many balls in the central bin.



Example 2:
If you are very unsure of your guess you should place the balls more evenly across the bins.



Example 3:
If you think the true value is most likely on the left of your guess, you should put most balls in the left and central bins.



Example 4:
If you think the true value is most likely on the right of your guess, you should put most balls in the right and central bins.

Optional instructions about the incentives

Additional information about the the payment mechanism

If a question from this part is selected for payment, then the computer will randomly select one of the bins from this question

Your probability of winning the bonus is determined by:

- The bin that contains the scientific estimate
- How you distribute the 20 balls

If:

- You put *B* out of 20 balls in the selected bin
- The scientific estimate is in the selected bin

You win the bonus with probability:

$100 - 100*(1 - B/20)^2$

For example:

- If you put 20 balls in that bin you win the bonus with 100% probability.
- If you put 4 balls in the bin you win the bonus with 36% probability.
- If you put 0 balls in the bin you win the bonus with 0% probability.

If:

- You put *B* out of 20 balls in the selected bin
- The scientific estimate is *not* in the selected bin

You win the bonus with probability:

$100 - 100*(B/20)^2$

For example:

- If you put 20 balls in that bin you win the bonus with 0% probability.
- If you put 4 balls in the bin you win the bonus with 96% probability.
- If you put 0 balls in the bin you win the bonus with 100% probability.

Comprehension questions

1. Your task in this part is to distribute [ ] balls across [ ] bins.

2. The number of balls that you place in each bin represents your level of certainty about the chance that the scientific estimate is in that bin.
   True; False

3. You maximize the chances of winning the bonus if you distribute the balls according to your level of certainty.
   True; False

4. It is best for you to put many balls into a bin only if:
   You think there are high chances that the scientific estimate is in that bin.; You think there are low chances that the scientific estimate is in that bin.

5. If you are not very certain in your answer, then:
   You should put all of your balls in one bin.; You should put balls in several of the bins.

C.2 Study 2: Risk Aversion Experiment

C.2.1 Introduction

Welcome!

This is a study conducted by researchers at the University of Amsterdam and the Ludwig Maximilians Universität München.

This study lasts about **30 minutes**.

The completion reward is **£3**.

In addition, you can win a bonus worth several pounds.

Your submission will be approved in seven working days.

You can expect to receive the bonus in seven working days as well.

This experiment works best on a computer and when the browser window is full screen.

The Economics and Business Ethics Committee (EBEC) of the University of Amsterdam has approved our study (Protocol number EC 20210505100551).

You can contact our Ethics Committee by writing to secbs-abs@uva.nl.

To receive ethical approval, we committed ***not*** to use misleading or untruthful instructions.

All your decisions are anonymous.

Comprehension questions

1. According to the ethical protocol under which we run this study, all the instructions you read must be truthful and not misleading.
   True; False

2. Your decisions are anonymous.
   True; False

C.2.2 WTM elicitation

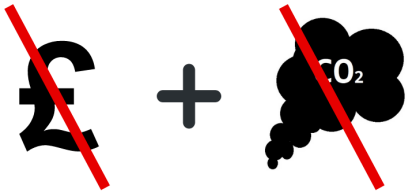
Instructions for Part 1

In this part, we will ask you to make several decisions between **CO_2 emissions** and a **monetary bonus**.

In each case, you will have to **choose between two options**:

Option A and **Option B**.

Option A



If you choose **Option A,** you will **not earn a bonus** and you will **not generate CO_2 emissions**.

Option B

If you choose **Option B,** you will **earn a bonus** and you will **generate CO_2 emissions**.

Option B

Depending on the decision, choosing Option B will lead to emissions between 0 and 20kg (44lb) of CO_2.

As a comparison, each person in the UK emits, on average, 14kg of CO_2 per day.*

* Source: The World Bank, 2019 data.
https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=GB

The emissions are real: The University of Amsterdam has arranged a fund to be donated to the Carbonfund.org Foundation to eliminate CO_2 from the atmosphere. The Carbonfund.org Foundation is a nonprofit organization that offsets CO_2 emissions. If you choose Option B in the randomly selected decision, then we will reduce the size of the fund, resulting in an increase of CO_2 in the atmosphere.

You can check our donation!

After the study is over, we will send you a link with the proof of the donation to Carbonfund.org.

Carbonfund.org

Invoice 10622 for order 38268

Order Date: May 14, 2019

Billing Address | **Shipping Address** | **Shipping Method**

No shipping

SKU	Product	Quantity	Price
general-donation	General Donation Name for certificate(s): Decks Pave on behalf of the University of Amsterdam	1	$511.48

Subtotal: $511.48

Payment Method: Credit Card

Total: $511.48

Customer Details

- Email:

This donation is the result of participants decisions in the experiments "Decision Making in 11" of the University of Amsterdam

This is the invoice of the donation from a previous study.

Example of a decision

Option A	**Option B**
You do not emit CO_2	You emit 5kg (11lb) of CO_2
In addition	*In addition*
◯ you earn a bonus of **£0**.	◯ you earn a bonus of **£5.**

This is an example of the decisions you will have to make. Imagine for a moment which option you would prefer in this example.

Example of a decision

Option A	**Option B**
You do not emit CO_2	You emit 5kg (11lb) of CO_2
In addition	*In addition*
● you earn a bonus of **£0**.	◯ you earn a bonus of **£5.**

If you choose **Option A**, then you mark your choice as above.

Example of a decision

Option A	**Option B**
You do not emit CO_2	You emit 5kg (11lb) of CO_2
In addition	*In addition*
◯ you earn a bonus of **£0**.	● you earn a bonus of **£5.**

If you choose **Option B**, then you mark your choice as above.

	Option A You do ***not*** emit CO_2 *in addition*	**Option B** You emit **5kg** (11lb) of CO_2 *in addition*
1)	● you earn **£0**	◯ you earn **£0**
2)	◯ you earn **£0**	◯ you earn **£0.5**
3)	◯ you earn **£0**	◯ you earn **£1**
4)	◯ you earn **£0**	◯ you earn **£1.5**
5)	◯ you earn **£0**	◯ you earn **£2**
6)	◯ you earn **£0**	◯ you earn **£2.5**
7)	◯ you earn **£0**	◯ you earn **£3**
8)	◯ you earn **£0**	◯ you earn **£3.5**
9)	◯ you earn **£0**	◯ you earn **£4**
10)	◯ you earn **£0**	◯ you earn **£4.5**
11)	◯ you earn **£0**	◯ you earn **£5**
12)	◯ you earn **£0**	◯ you earn **£5.5**
13)	◯ you earn **£0**	◯ you earn **£6**
14)	◯ you earn **£0**	◯ you earn **£6.5**
15)	◯ you earn **£0**	◯ you earn **£7**

You will make several decisions, arranged in a list like the one above. In each row, you have to choose Option A or Option B.

- **Option A** is always the same.
- **Option B** differs in the bonus you earn.

	Option A You do ***not*** emit CO_2 *in addition*	Option B You emit **5kg** (11lb) of CO_2 *in addition*
1)	● you earn **£0**	○ you earn **£0**
2)	○ you earn **£0**	○ you earn **£0.5**
3)	○ you earn **£0**	○ you earn **£1**
4)	○ you earn **£0**	○ you earn **£1.5**
5)	○ you earn **£0**	○ you earn **£2**
6)	○ you earn **£0**	○ you earn **£2.5**
7)	○ you earn **£0**	○ you earn **£3**
8)	○ you earn **£0**	○ you earn **£3.5**
9)	○ you earn **£0**	○ you earn **£4**
10)	○ you earn **£0**	○ you earn **£4.5**
11)	○ you earn **£0**	○ you earn **£5**
12)	○ you earn **£0**	○ you earn **£5.5**
13)	○ you earn **£0**	○ you earn **£6**
14)	○ you earn **£0**	○ you earn **£6.5**
15)	○ you earn **£0**	○ you earn **£7**

There will be several lists like the one above.
At the end of the experiment, one of your decisions from one of these lists will be implemented (there will be more details on this point later in the instructions).

	Option A You do ***not*** emit CO_2 *in addition*	Option B You emit **5kg** (11lb) of CO_2 *in addition*
1)	● you earn **£0**	○ you earn **£0**
2)	○ you earn **£0**	○ you earn **£0.5**
3)	○ you earn **£0**	○ you earn **£1**
4)	○ you earn **£0**	○ you earn **£1.5**
5)	○ you earn **£0**	○ you earn **£2**
6)	○ you earn **£0**	○ you earn **£2.5**
7)	○ you earn **£0**	○ you earn **£3**
8)	○ you earn **£0**	○ you earn **£3.5**
9)	○ you earn **£0**	○ you earn **£4**
10)	○ you earn **£0**	○ you earn **£4.5**
11)	○ you earn **£0**	○ you earn **£5**
12)	○ you earn **£0**	○ you earn **£5.5**
13)	○ you earn **£0**	○ you earn **£6**
14)	○ you earn **£0**	○ you earn **£6.5**
15)	○ you earn **£0**	○ you earn **£7**

In each of the lists, in each row the bonus increases by £0.5.
Thus, choosing Option B becomes more attractive as you go down the rows.

Usually, people start by preferring Option A in row 1: there is no bonus and hence no earnings when emitting CO_2.

Then, they switch to Option B when they arrive at a row where the bonus is high enough for them to allow the CO_2 emissions.

The row where you switch indicates the **minimum bonus you need to receive to allow the CO_2 emissions**.

Examples

	Option A You do ***not*** emit CO_2 *in addition*	Option B You emit **5kg** (110lb) of CO *in addition*
1)	● you earn **£0**	○ you earn **£0**
2)	● you earn **£0**	○ you earn **£0.5**
3)	○ you earn **£0**	● you earn **£1**
4)	○ you earn **£0**	● you earn **£1.5**
5)	○ you earn **£0**	● you earn **£2**
6)	○ you earn **£0**	● you earn **£2.5**
7)	○ you earn **£0**	● you earn **£3**
8)	○ you earn **£0**	● you earn **£3.5**
9)	○ you earn **£0**	● you earn **£4**
10)	○ you earn **£0**	● you earn **£4.5**
11)	○ you earn **£0**	● you earn **£5**
12)	○ you earn **£0**	● you earn **£5.5**
13)	○ you earn **£0**	● you earn **£6**
14)	○ you earn **£0**	● you earn **£6.5**
15)	○ you earn **£0**	● you earn **£7**

Example 1
If you answer as above, you indicate that minimum bonus you need to receive to allow the CO_2 emissions is £1.

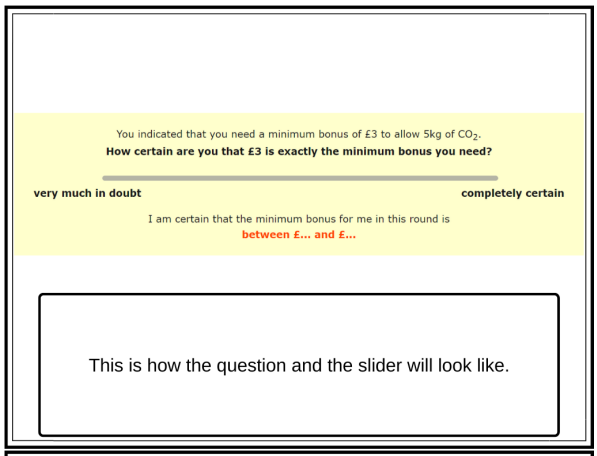
Examples

	Option A You do ***not*** emit CO_2 *in addition*	Option B You emit **5kg** (110lb) of CO *in addition*
1)	● you earn **£0**	○ you earn **£0**
2)	● you earn **£0**	○ you earn **£0.5**
3)	● you earn **£0**	○ you earn **£1**
4)	● you earn **£0**	○ you earn **£1.5**
5)	● you earn **£0**	○ you earn **£2**
6)	● you earn **£0**	○ you earn **£2.5**
7)	● you earn **£0**	○ you earn **£3**
8)	● you earn **£0**	○ you earn **£3.5**
9)	● you earn **£0**	○ you earn **£4**
10)	● you earn **£0**	○ you earn **£4.5**
11)	● you earn **£0**	○ you earn **£5**
12)	○ you earn **£0**	● you earn **£5.5**
13)	○ you earn **£0**	● you earn **£6**
14)	○ you earn **£0**	● you earn **£6.5**
15)	○ you earn **£0**	● you earn **£7**

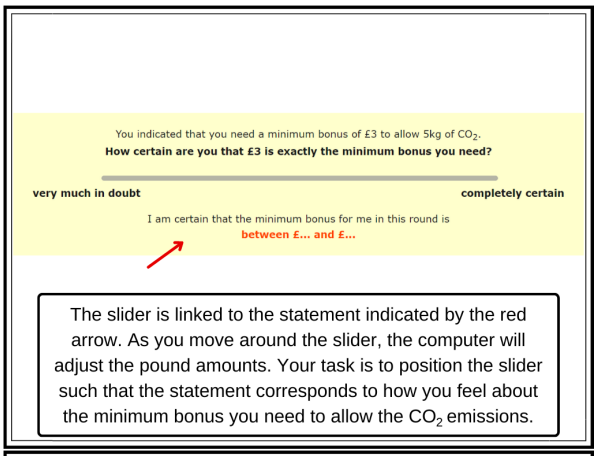
Example 2
If you answer as above, you indicate that minimum bonus you need to receive to allow the CO_2 emissions is £5.5.

You may actually be in doubt about what the minimum bonus should exactly be for you to allow CO_2 emissions.

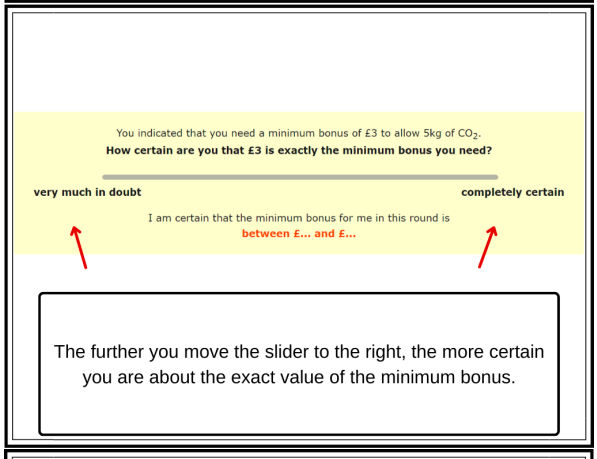
That is why, after you complete a set of decisions, we might ask you to use a slider to indicate **how certain you are** about the minimum bonus you have just indicated.



This is how the question and the slider will look like.



The slider is linked to the statement indicated by the red arrow. As you move around the slider, the computer will adjust the pound amounts. Your task is to position the slider such that the statement corresponds to how you feel about the minimum bonus you need to allow the CO_2 emissions.



The further you move the slider to the right, the more certain you are about the exact value of the minimum bonus.

In this experiment, there are **6 rounds** in which you have to decide between Option A and Option B.

In each round, choosing Option B implies generating a different amount
(0kg, 4kg, 8kg, 12kg, 16kg, 20kg)
of CO_2 emissions.

Payment

To determine the payment, the computer has already randomly selected a round and a decision in that round.

If, for the selected round and the decision, you chose

- Option A, then nothing will happen.
- Option B, then you will earn the bonus amount and generate the CO_2 emissions associated with the round.

You do not know in advance which round and decision have been selected, so **take each decision as if it is the one that counts**.

There are no wrong or right answers in this experiment. In your answers, you should simply think about the minimum bonus you need to receive in order to allow the emissions.

Comprehension questions

Suppose a participant answered a set of decisions as in the picture below.

		Option A You do **not** emit CO_2 *in addition*	**Option B** You emit **5kg** (11lb) of CO_2 *in addition*
	1)	☒ you earn **£0**	☐ you earn **£0**
	2)	☒ you earn **£0**	☐ you earn **£0.5**
	3)	☒ you earn **£0**	☐ you earn **£1**
➔	4)	☒ you earn **£0**	☐ you earn **£1.5**
	5)	☒ you earn **£0**	☐ you earn **£2**
	6)	☒ you earn **£0**	☐ you earn **£2.5**
	7)	☐ you earn **£0**	☒ you earn **£3**
	8)	☐ you earn **£0**	☒ you earn **£3.5**
	9)	☐ you earn **£0**	☒ you earn **£4**
	10)	☐ you earn **£0**	☒ you earn **£4.5**
	11)	☐ you earn **£0**	☒ you earn **£5**
	12)	☐ you earn **£0**	☒ you earn **£5.5**
➔	13)	☐ you earn **£0**	☒ you earn **£6**
	14)	☐ you earn **£0**	☒ you earn **£6.5**
	15)	☐ you earn **£0**	☒ you earn **£7**

1. What is the minimum bonus which this participant is requesting to allow the CO_2 emissions? £ ☐ .

2. If decision 4) - indicated by blue arrow - is randomly selected, then the participant will receive a bonus of £ ☐ and:
   The participant will emit CO_2; The participant will not *emit CO_2*

3. If, instead, decision 13) - indicated by orange arrow - is randomly selected, then the participant will receive a bonus of £ ☐ and:
   The participant will emit CO_2; The participant will not *emit CO_2*

4. Now imagine that the participant who made the decision above is in doubt about what should be the exact value of the minimum bonus. However, the participant is certain that the minimum bonus is between £1.25 and £4.75. Please position the slider below to accurately reflect this degree of doubt.

5. The amount of CO_2 in the atmosphere will stay the same irrespective of your decisions in this part of the experiment.
   True; False

6. When the study is over, we will send you the link with the proof of our donation to Carbonfund.org.
   True; False

C.2.3 Work task #1

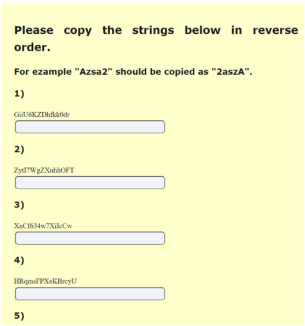
Instructions for Part 2

In this part, you need to complete a **work task**.

The work task consists of typing strings of letters and numbers in reverse order.

When you type a string in reverse, you have to capitalize all letters that are capitalized in the original string. For example, the string "Asw12WerTT" needs to be typed as "TTreW21wsA".

You will have to type in reverse several strings and you will be able to continue with the experiment only after you have correctly typed all of them.

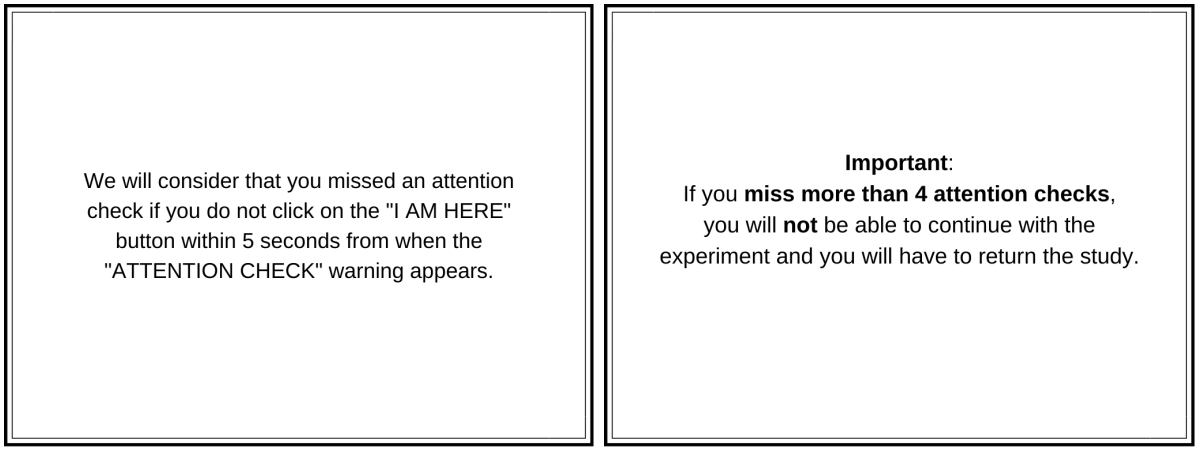


This is how the work task looks like.

It is important for us that you complete the task in one go.

So, to make sure that you are attentive to the task, every 30 seconds the program will display an **"ATTENTION CHECK"** warning.

From the moment the warning appears, you have **5 seconds** to press the **"I AM HERE"** button.



Comprehension questions

1. In the work task, what is the correct way of typing the string "Asw12WerTT" in reverse?
   Asw12WerTT; ttrew21wsa; TTreW21WSA

2. What do you have to do when "ATTENTION CHECK" warning appears?
   click the "I AM HERE" button within 5 seconds; click the "ATTENTION CHECK" sign within 5 seconds; do nothing

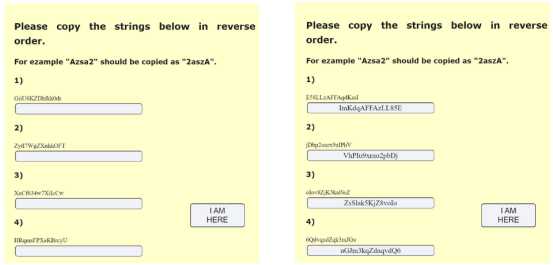
C.2.4 Purchase decision

Instructions for Part 3

At the end of this experiment, you will have to perform the work task once again.

In this part, **you can choose to get a computer code that makes the next work task easier and quicker to complete**.

The computer code simplifies the work task



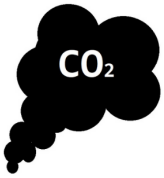
Without the computer code, you have to type the answers

With the computer code, the answers are ready to be submitted

The computer code reads the strings and it types them in reverse on the work task screen.

If you choose to get the computer code:

- You complete the task immediately
- You don't have to deal with the attention checks
- The only thing you have to do is to press the "Confirm" button



However, if you choose to get the computer code, you might emit CO_2 into the atmosphere.

The emissions can range between 0kg and 8kg of CO_2 .
You will get more information about the exact emission size later in the experiment.

As a comparison, a person in the UK emits, on average, 14kg of CO_2 per day.*

* Source: The World Bank, 2019 data.
https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=GB

Remember, the emissions are real: The University of Amsterdam has arranged a fund to be donated to the Carbonfund.org Foundation to eliminate CO_2 from the atmosphere. The Carbonfund.org Foundation is a nonprofit organization that offsets CO_2 emissions. If you choose Option B in the randomly selected decision, then we will reduce the size of the fund, resulting in an increase of CO_2 in the atmosphere.

Remember, you can check our donation!

After the study is over, we will send you a link with the proof of the donation to Carbonfund.org.

Comprehension questions

1. At the end of the experiment, you will have to complete the work task once again.
   True; False

2. The amount of CO_2 in the atmosphere will stay the same irrespective of your decisions in this part of the experiment.
   True; False

3. When the study is over, we will send you the link with the proof of our donation to Carbonfund.org.
   True; False

C.2.5 Questionnaire

Page 1/4

In the following questions, we pose some hypothetical decisions in the experiment. For each decision, please indicate how morally appropriate you think they are on a scale from **1 (very inappropriate)** to **7 (very appropriate)**.

1. Emitting **4 kg of CO_2** in exchange for a **£1 bonus**.
2. Emitting **4 kg of CO_2** in exchange for a **£5 bonus**.
3. Emitting **12 kg of CO_2** in exchange for a **£1 bonus**.
4. Emitting **12 kg of CO_2** in exchange for a **£5 bonus**.
5. This is an attention check. Select option **six** in this question.
6. Emitting **20 kg of CO_2** in exchange for a **£1 bonus**.
7. Emitting **20 kg of CO_2** in exchange for a **£5 bonus**.

Page 2/4

Do you agree with the following statements? (1: completely disagree; 5: completely agree)

1. When I am not sure about the size of the CO_2 emissions, I am generating, I don't feel responsible for generating these emissions.
2. When I made the decisions in the experiment, I was comparing the CO_2 emissions to those I emit in my daily activities.
3. When I made the decisions in the experiment, I was taking into account the emissions that I generated so far this year.
4. The amount of emissions in kg has **no** meaning to me.
5. It is important to me not to contribute to climate change.
6. An action is either dirty or environmentally friendly: there is no middle ground between these two extremes.
7. This is an attention check. Select option four in this question.
8. If a product or service is polluting, people should stop buying it. Just reducing the quantities purchased is not enough.

Page 3/4

1. Age: [ ]
2. Gender:
   Male; Female; Other
3. In which country do you live? [ ]
4. Generally speaking, where do you place yourself on the left-right political spectrum?:
   Left; Center-left; Center; Center-right; Right
5. What is the highest level of school you have completed or the highest degree you have received?:
   Less than high school degree; High school degree; Some University but no degree; Bachelor degree; Postgraduate degree
6. How much total combined money did all members of your HOUSEHOLD earn last year?
   £0 to £5,000; £5,000 to £15,000; £15,000 to £30,000; £30,000 to £45,000; £45,000 to £60,000; £60,000 to £75,000; £75,000 to £90,000; £90,000 to £105,000; more than £105,000
7. Which device are you using to complete this study?
   Phone; Tablet; Laptop or Desktop
8. Do you trust that the researchers will indeed buy CO_2 offsets as described in the instructions? *The answer to this question - as to any other questions in the experiment - will not affect the approval of your submission.*
   1 - not at all; 2; 3; 4; 5 - completely
9. Do you offset the CO_2 emissions associated with your consumption activities?
   Never; Rarely; Often; I offset all the emissions associated with my consumption

Page 4/4

1. How annoying did you find the work task to be?
   1 - Not annoying at all; 2; 3; 4; 5 - Absolutely annoying
2. Did you encounter any problem in the way the pages of the experiment were displayed? If so, please indicate the model of your device, the browser you are using, and the problem you encountered. [ ]
3. Was there anything in the instructions that was unclear, or do you have any other feedback? [ ]

C.2.6 Work task #2

Obtained the code

Instructions for Part 4

The work task will begin on the next screen.

You chose to get the computer code.
The computer code will prefill the correct answers on the work task screen.

You only have to press "Confirm" to complete the task.

Did not obtain the code

Instructions for Part 4

The work task will begin on the next screen.

You did not get the computer code, so you will have to complete the work task without help.

Remember to press the "I AM HERE" button when the "ATTENTION CHECK" warning appears on the screen.

C.3 Study 3: Motivated Belief Experiment

C.3.1 Set 1: Introduction

Welcome!

This is a study of the University of Amsterdam

UNIVERSITEIT VAN AMSTERDAM

The researchers responsible for this study are:

Davide Pace

Joël van der Weele

Peter Schwardmann

In this study you earn £1.60

We expect the study to take you approximately 13 minutes

We ***guarantee***, on behalf of the University of Amsterdam, everything we state in the instructions is true.

The Ethics Committee Economics and Business (EBEC) of the University of Amsterdam has approved our study. (Protocol EC 20180625040627).

To receive the approval we committed ***not*** to use deception.

UNIVERSITEIT VAN AMSTERDAM

You are anonymous!

Your decisions are anonymous: we have access only to your Prolific PID and we are not able to match it with your identity outside of Prolific

Please answer the questions below.

Comprehension questions

1. Please state the last three digits of the ethical protocol you found in one of the slides above: ☐
2. Your decisions are anonymous.
   True; False

C.3.2 Set 2: Purchasing the good

This set of instructions is common to all participants. However, depending on the treatment they are in, participants might see a different price for the product.

Instructions. Part **1** of **3**

Read all the slides on this page and answer the questions below.

You have to answer all the questions below correctly to continue with the study.

In the slides you will find

1) Instructions on the tasks of the study

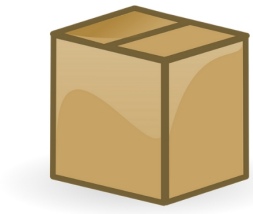
2) Information about an additional bonus

In total there are 3 sets of slides with instructions

INSTRUCTIONS

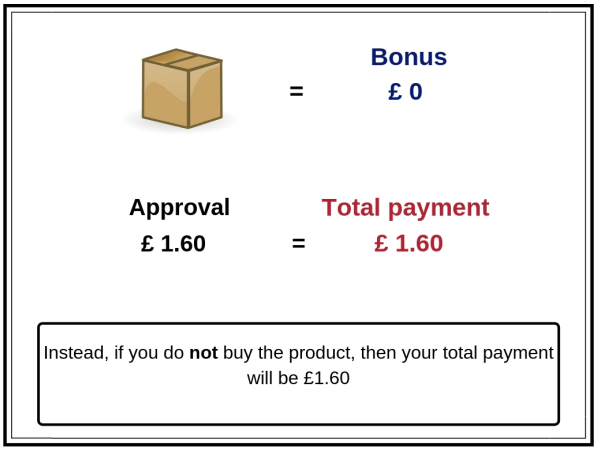
Remember

You earn **£1.60** for completing this study.



In this study you can buy a virtual product. You will earn a bonus if you buy the product

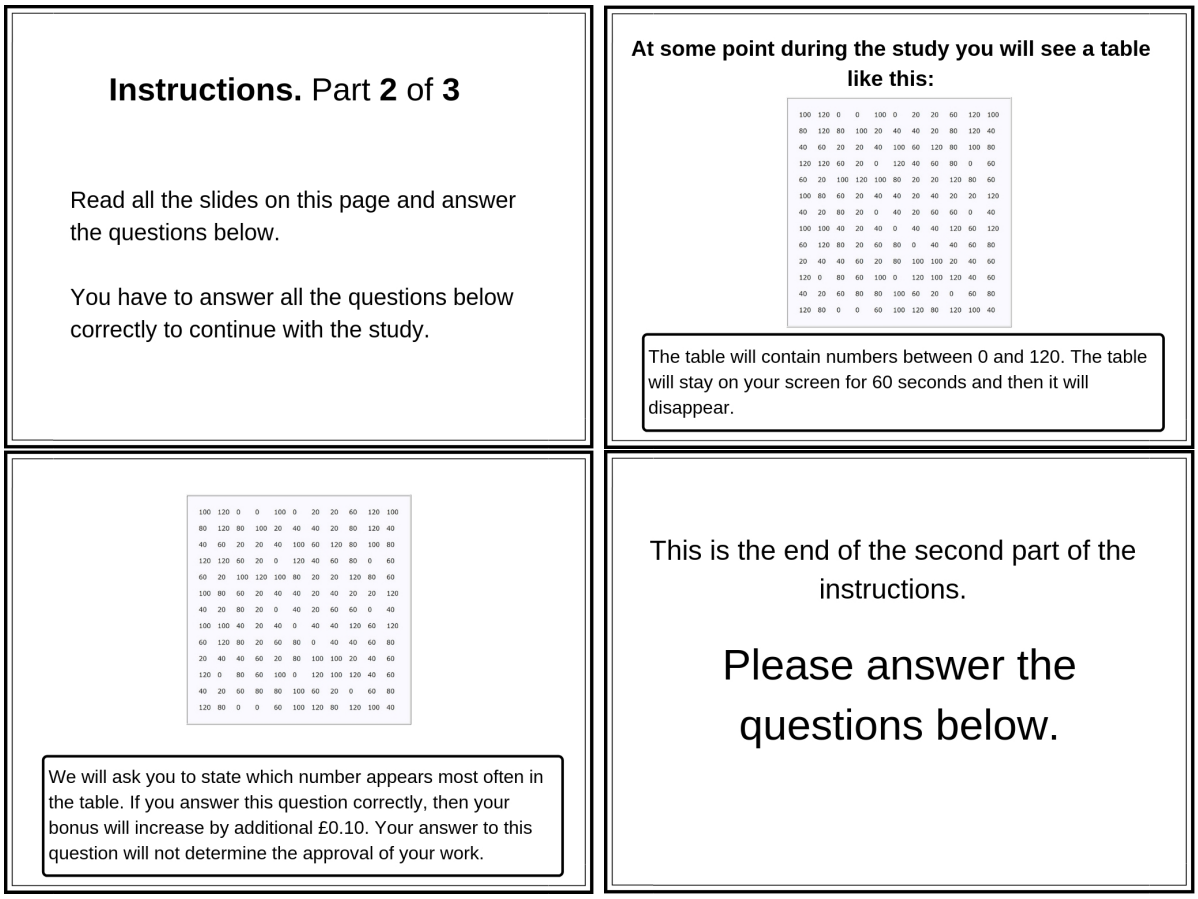
The value of the product is £2.



Comprehension questions.

1. You will earn £ [ ] for completing this study.
2. The virtual product costs £ [ ] .
3. If you buy the virtual product, then you will receive a total payment of £ [ ] .
4. If you buy the virtual product, then you will receive a total payment of £ [ ] .

C.3.3 Set 3: Attention task



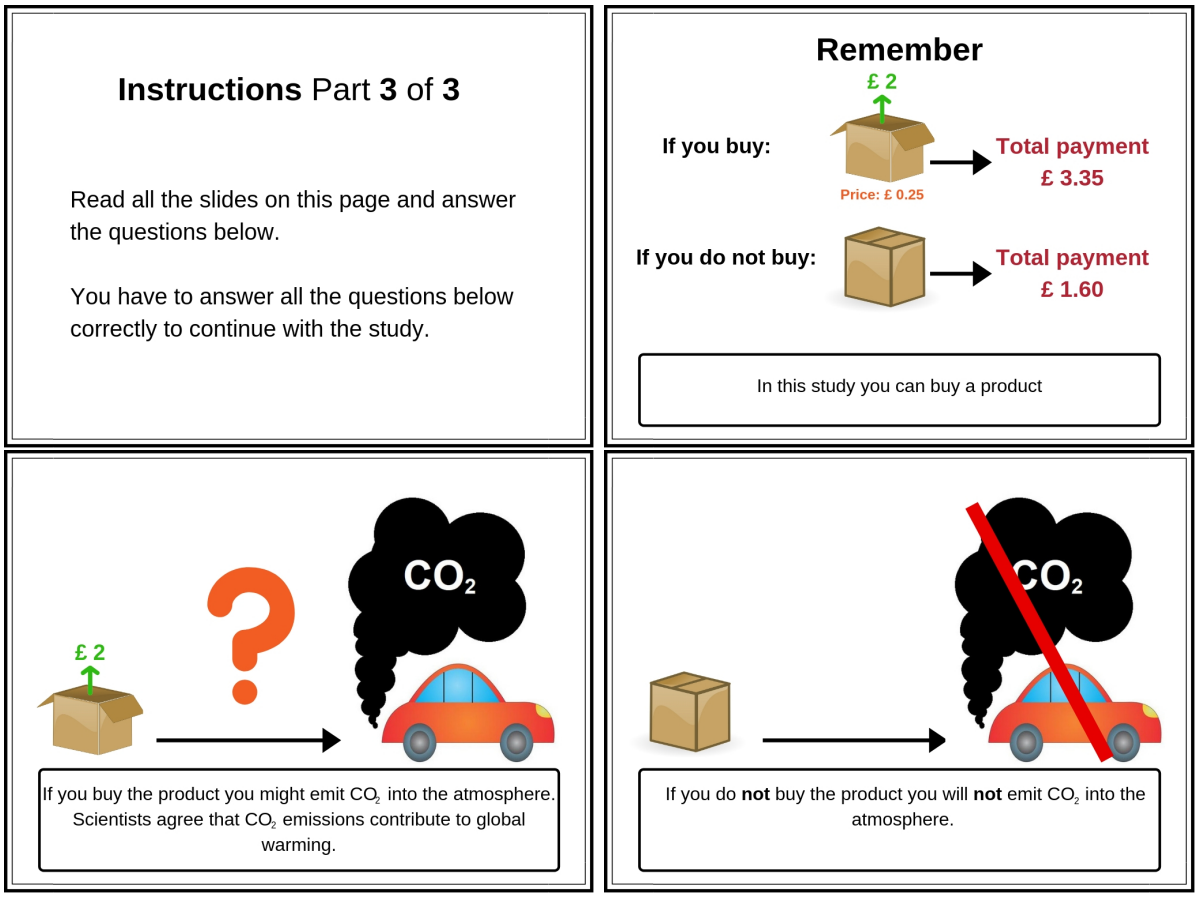
Comprehension questions

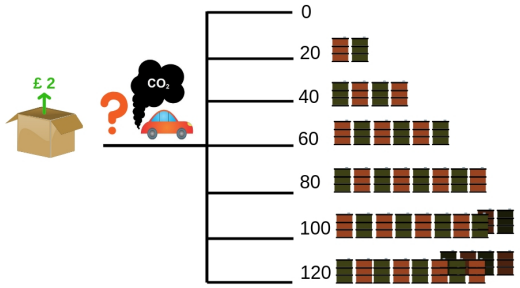
1. In the table you will find numbers between ☐ and ☐.
2. If you state the number that appears most often in the table correctly, then you will earn £ ☐.

After this set of instructions, participants in the *Unmotivated* treatment receive the puzzle. Instead, participants in the *Motivated* treatment proceed directly to the fourth set of instructions.

C.3.4 Set 4: Externality

Instructions common to the *Motivated* and *Unmotivated* treatment.





If you buy the product you will emit **between** 0kg (0lb) **and** 279.0kg (509.3lb) of CO_2 into the atmosphere. This is equivalent to the CO_2 emitted burning **between** 0 **and** 120 liters (26.4 gal) of gasoline.

These emissions are real: the University of Amsterdam has arranged a fund to be donated to Carbonfund.org Foundation to eliminate CO_2 from the atmosphere. Carbonfund.org Foundation is a nonprofit organization that offsets CO_2 emissions.

If you buy the virtual product, then you will reduce the size of the fund, resulting in an increase of CO_2 in the atmosphere.

You can check our donation!

We will send you a link after the study is over, there you can find:

1) Proof of our donation to Carbonfund.org

2) Information on how the amount of the donation was calculated.

About the Price:

1) The price has been randomly assigned to you.

2) There is **no relationship** between the price of the product and the amount of CO_2 emission the product produces.

Instructions that differ between the *Unmotivated* and *Motivated* treatment.

***Unmotivated* treatment**	***Motivated* treatment**
How much CO_2 emissions do you produce if you buy the product? **Remember:** In this study you saw a table full of numbers between 0 and 120	**How much CO_2 emissions do you produce if you buy the product?** **Remember:** In this study you will see a table full of numbers between 0 and 120
How much CO_2 emissions do you produce if you buy the product? The number that appeared most often indicates the amount of CO_2 you will produce. It corresponds to the number of liters of gasoline that you need to burn to produce as much CO_2 as generated by buying the product.	**How much CO_2 emissions do you produce if you buy the product?** The number that appears most often in the table indicates the amount of CO_2 you will produce. It corresponds to the number of liters of gasoline that you need to burn to produce as much CO_2 as generated by buying the product.
How much CO_2 emissions do you produce if you buy the product? **You stated that this number is 60**	**How much CO_2 emissions do you produce if you buy the product?** If you want to know how much CO_2 you will produce buying the product, then look for this number

Remember

Everything we state must be true, otherwise we would violate the ethical protocol under which we run this study

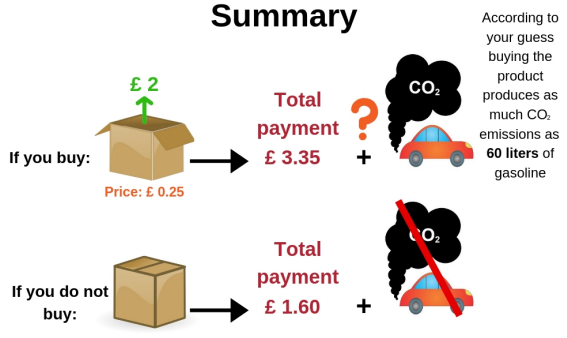
You can contact our Ethics Committee writing to secbs-abs@uva.nl.
Our reference number is
EC 20180625040627

Remember

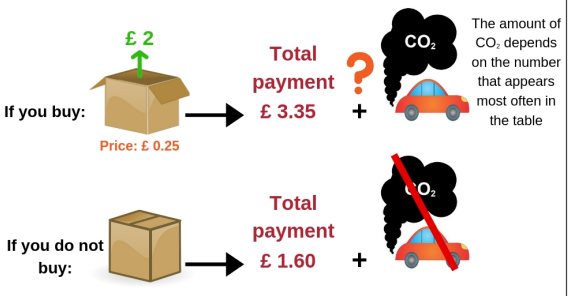
Everything we state must be true, otherwise we would violate the ethical protocol under which we run this study

You can contact our Ethics Committee writing to secbs-abs@uva.nl.
Our reference number is
EC 20180625040627

Summary



Summary



This is the end of the last set of instructions.

Please answer the questions below.

This is the end of the last set of instructions.

Please answer the questions below.

Comprehension questions: *Unmotivated* treatment

1. If you buy the product, then you will emit as much CO_2 into the atmosphere as burning between [ ] and [ ] liters of gasoline.

2. The amount of CO_2 in the atmosphere will ***not*** be affected by my decisions.
   True; False

3. When the study is over we will send you the link with the proof of our donation to Carbonfund.org.
   True; False

4. The CO_2 emissions do ***not*** depend on the price of the product.
   True; False

5. The price of the product has been randomly assigned to you.
   True; False

6. The number that appeared most often in the table you saw before indicates the liters of gasoline you have to burn to generate as much CO_2 as buying the product.
   True; False

7. Is there any possibility that the information you were provided with, including the information about the potential CO_2 emissions you might cause, is false?
   YES, the researchers may deceive participants.; NO, the researchers are committed by their Ethics Committee not to use any deception.

Comprehension questions: *Motivated* treatment

1. If you buy the product, then you will emit as much CO2 into the atmosphere as burning between [ ] and [ ] liters of gasoline.

2. The amount of CO_2 in the atmosphere will ***not*** be affected by my decisions.
   True; False

3. When the study is over we will send you the link with the proof of our donation to Carbonfund.org.
   True; False

4. The CO_2 emissions do ***not*** depend on the price of the product.
   True; False

5. The price of the product has been randomly assigned to you.
   True; False

6. The number that appears most often in the table will indicate the liters of gasoline you have to burn to generate as much CO_2 as buying the product.
   True; False

7. Is there any possibility that the information you were provided with, including the information about the potential CO_2 emissions you might cause, is false?
   YES, the researchers may deceive participants.; NO, the researchers are committed by their Ethics Committee not to use any deception.

After answering the questions correctly, participants in the *Unmotivated* and *Info treatments* proceed to the screen where they can buy the product. Participants in the *Motivated* treatment, instead, first receive the puzzle and only afterward reach the page where they can buy the product.

C.3.5 Questionnaire

1. Do you think human activity is responsible for global warming?
   Yes; No

2. Do you think climate change is an important problem?
   Yes; No

3. Generally speaking, where do you place yourself on the left-right political spectrum?
   left; center-left; center; center-right; right

4. What is the highest level of school you have completed or the highest degree you have received?
   Less than high school degree; High school degree; Some University but no degree; Bachelor degree; Master degree; Doctoral degree

5. How much total combined money did all members of your HOUSEHOLD earn last year?
   £0 to £5,000 or 0€ to 6,000€; £5,000 to £15,000 or 6,000€ to 17,000€; £15,000 to £30,000 or 17,000€ to 35,000€; £30,000 to £45,000 or 35,000€ to 50,000€; £45,000 to £60,000 or 50,000€ to 70,000€; £60,000 to £75,000 or 70,000€ to 87,000€; £75,000 to £90,000 or 87,000€ to 104,000€; £90,000 to £105,000 or 104,000€ to 12,1000€; £105,000 to £120,000 or 121,000€ to 138,000€; £120,000 and up or 138,000€ and up; Prefer not to answer

6. Do you trust that the researchers will indeed buy CO_2 offsets as described in the instructions?
   Yes; No

7. How often do you drive a car:
   Never; Less than once per month; Few times per month; Every week; Daily or almost daily

8. Was there anything in the instructions that was unclear? ☐

References

Amasino, Dianna, Davide Pace, and Joël J. van der Weele. 2021. "Fair Shares and Selective Attention." Tinbergen Institute Discussion Paper 2021-066/I.

Engelmann, Jan, Alejandro Hirmas, and Joël J. van der Weele. 2021. "Top Down or Bottom Up? Disentangling the Channels of Attention in Risky Choice." Tinbergen Institute Discussion Paper 2021-031/I.

Enke, Benjamin, and Thomas Graeber. 2023. "Cognitive uncertainty." *Quarterly Journal of Economics*, 138(4): 2021–2067.

Pärnamets, Philip, Petter Johansson, Lars Hall, Christian Balkenius, Michael J. Spivey, and Daniel C. Richardson. 2015. "Biasing Moral Decisions by Exploiting the Dynamics of Eye Gaze." *Proceedings of the National Academy of Sciences*, 112(13): 4170–4175.

Rodemeier, Matthias. 2023. "Willingness to Pay for Carbon Mitigation: Field Evidence from the Market for Carbon Offsets." IZA Discussion Paper 15939.

US Census Bureau. 2022. "National Population by Characteristics: 2020-2022." United States Census Bureau. `https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-detail.html`.