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Abstract

We study the role of co-benefits – positive effects of climate protection projects in addition to CO_2 reduction – for the motivation to contribute to climate change mitigation. In two artefactual field experiments conducted with large population samples from Germany (n = 2,400 in total), we test if and how the existence and specific nature of co-benefits affect donations. In both experiments, we find that co-benefits have a positive impact on contributions to climate protection. Our second experiment shows that contributions also respond to the nature of co-benefits, and these responses seem to be driven by individual donor preferences for the respective type of co-benefit. Moreover, we observe that making carbon footprints and thus individual responsibility for environmental externalities more salient increases donations irrespective of the existence and nature of co-benefits. Finally, when uncertainty about co-benefits is introduced, the majority of potential donors requests information in both experiments, and those who choose to be informed about co-benefits provide higher donations relative to subjects who choose not to be informed.

Key Words: Co-benefits, Charitable giving; Climate change mitigation; Field experiment; Carbon-offsets

JEL Classification: D64, H41, L31, Q51

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1. *Introduction and related literature*

Individuals can mitigate climate change by donating to climate protection projects, either as a direct donation or as part of personal carbon-offsetting. More and more charitable organizations and carbon-offsetting funds offer the possibility to donate money in order to reduce one's environmental externalities, indicating a growing market for these services. Apart from the mere effects of donations for carbon reductions, many compensation services provide information about the 'co-benefits' of their projects, i.e. additional positive effects that go beyond the direct effect of climate protection. The effects of co-benefits and the provision of information about them for individual contributions are in the focus of this study.

We conduct two artefactual field experiments with representative population samples from Germany (n = 2,400 in total) in order to gain comprehensive insights into preferences to donate for climate change mitigation (CCM) projects and the responses to co-benefits. In the first experiment, we analyze how information about co-benefits affects individual donations for CCM projects. We further investigate whether subjects have a preference for receiving this information. In our second experiment, we test how the specific nature of co-benefits influences individual donation behavior. To model the central characteristic of co-benefits that a positive impact is created on top of the contribution to the specific CCM project, we match donations for climate protection in our experiment with donations to other charitable causes, focusing on 'climate', 'environmental', 'social' and 'economic' co-benefits.[1] Specifically, we investigate to what extent donations are driven by individual preferences for the respective additional project resembling the co-benefit as well as by degree of substitutability of the additional project to the original climate project. Finally, we test whether donations in the presence of co-benefits are increased when subjects' personal responsibility for CO_2 emissions is made salient by framing them as offsets of one's own emissions rather than as mere

[1] This is similar to the framing of co-benefits in many real mitigation projects. For example, the 'Carbon-offsetting platform' of the United Nations offers different projects to mitigate climate change. In addition to the price per ton and the available tons that can be mitigated, the projects are described in detail and 'environmental', 'social' and 'economic' co-benefits are specified. See https://offset.climateneutralnow.org/AllProjects for details.

donations. This is done because mitigation projects are in practice often offered to people when they have just caused externalities or when they are just made aware of their personal negative environmental externalities, e.g. when booking a flight or when receiving the energy bill.

Our paper makes several contributions to the literature. First, we investigate in controlled settings with two large population samples from Germany how individual preferences to donate for CCM projects respond to the existence of co-benefits associated with the projects. Previous studies eliciting economic measures for one's willingness to pay for climate protection have focused on the reduction of CO_2 emissions (e.g. Löschel et al. 2013, Diederich and Goeschl 2014, Andre et al. 2021) or the willingness to compensate for one's CO_2 emissions (Kesternich et al. 2016, Kesternich et al. 2019, Berger et al. 2021), but not on the impact of co-benefits for these decisions.

Second, so far, despite their presence in promoting climate protection projects, only few studies explicitly analyze the role of co-benefits for donations towards climate protection, and these studies are mostly based on survey data.[2] MacKerron et al. (2009) investigate the relevance of co-benefits for the willingness to pay for carbon-offsets in a stated choice experiment in the context of flights. The authors observe substantially higher (hypothetical) payments for carbon-offsetting projects that include co-benefits. Similar, Longo et al. (2012) analyze the effects of local co-benefits on the willingness to pay for climate change mitigation, also using a stated preference approach. Again, the authors find that local 'ancillary benefits' can increase the stated willingness to pay for climate mitigation programs significantly. Given the possible discrepancies between stated preferences and attitudes derived from surveys on the one hand and actual behavior of decision-makers on the other hand, it is important to test the impact of co-benefits also

[2] For example, Bain et al. (2016) find in a large cross-cultural survey study that especially those individuals engage in pro-environmental behavior who expect climate protection measures to have positive effects also in other societal domains. In their study, these expectations on co-benefits strongly correlate with actual climate protection behavior. Indirect evidence on the importance of co-benefits have been found by Löschel et al. (2021) measuring individual demand for certificates of local and global emission trading schemes in China. Participants purchase more certificates from the local trading system than for global trading schemes, in line with the notion that (local) co-benefits may be an important driver of climate change mitigation.

with the help of incentivized tasks where real money is at stake. To the best of our knowledge, only two other studies investigate the role of co-benefits in an incentivized way. First, Bartels et al. (2021) focus on local co-benefits and analyze whether emphasizing the local advantages of a carbon sink may increase donations towards the sink. Here, the average amount of donations is neither affected by the information on the local benefits of the carbon sink, nor by participants' distance to the sink. Second, Svenningsen (2019) uses an incentivized discrete choice experiment with a Danish sample to study subjects' preference for climate policies that have different distributive outcomes in the year 2100 across three world regions. She finds that distributional outcomes of climate policy matter for donors when investing in these policies and also that health-related co-benefits make a policy more attractive, regardless of the region where it accrues. These previous studies each focus on a specific co-benefit that is not quantifiable from a donors' perspective. In our second experiment, we vary the types of co-benefits in a controlled way and define their economic size, hence controlling for donors' beliefs about its impact of the co-benefit. Moreover, we test donor responses to co-benefits providing both qualitative and quantitative information about co-benefits. We also investigate to what extent donors actively search for information under various degrees of uncertainty about co-benefits. Hence, our study provides a comprehensive and controlled test of how the existence and the specific nature of co-benefits affect donation decisions.

Third, we investigate to what extent highlighting the personal responsibility for creating CO_2 externalities affects participants' willingness to donate in the presence of co-benefits. Related studies in the context of prosocial and moral behavior would suggest that from a decision-maker's perspective, it makes a difference whether one has to compensate for one's personal carbon footprint or whether one donates for CO_2 reduction irrespective of the personal environmental impact. Many institutions offer CCM projects in connection to customer purchases involving environmental externalities (e.g. together with flight tickets). Therefore, it is important to test to what extent co-benefits affect donations both in the presence and the absence of direct individual responsibility. For instance, Jakob et al. (2017) show that individuals have a preference to remove externalities they have created, and are willing to accept efficiency losses for doing it themselves rather than

delegating the action to someone else. Moreover, in the context of ethical behavior, Gneezy et al. (2014) find evidence for patterns of 'conscience accounting': taking an unethical action creates a sense of guilt which can eventually be counterbalanced by an ethical action. The authors also suggest that reminders about previous unethical actions can induce higher donations. Transferred to our setting this would imply that reminding individuals about their responsibility for creating environmental damages might trigger a feeling of guilt which then increases the willingness to donate. Finally, emphasizing individual responsibility for environmental pollution may trigger higher donations because it might counteract the inherent diffusion of responsibility in this context, for instance, due to the difficulties in linking individual actions to concrete environmental damages. Previous literature has provided evidence that responsibility diffusion leads to a decline in prosocial and moral behavior (see, for instance, Dana et al. 2007, Hamman et al. 2010, Falk et al. 2020). Testing individuals' willingness to compensate negative externalities imposed on others ex-post in the laboratory, Stehr and Werner (2021) find that diffusion of responsibility lowers the amount paid for compensation and increases externalities.[3]

Fourth, given that we model the co-benefits of donations into CCM projects as money matched into alternative projects in our second experiment, we also contribute to the literature on the determinants of charitable giving (Vesterlund 2016 reviews the experimental literature and the potential underlying motivations to donate for charitable causes). Specifically, we investigate how the target of the exogenous matching (i.e., the characteristics of the charitable project into which the matched amount is paid) affects

[3] Several studies have used stated-preference approaches to investigate attitudes towards carbon-offsetting: Schwirplies et al. (2019) use online-surveys with a representative subject pool in order to analyze whether subjects are more likely to (hypothetically) offset their emissions in certain modes of transportation (e.g. bus versus plane) or in different travel occasions (e.g. business versus private journeys). They find different levels of offsetting behavior in the mode of transportation, but not the travel occasion. Also, the authors find a higher willingness to offset carbon emissions when offsets are (hypothetically) matched by the travel provider at a 1:1 scheme while a 1:1/3 matching has no effect in most contexts. Schwirplies and Ziegler (2016) investigate the difference between offsetting carbon emissions and paying a price premium to avoid emissions. They find no differences between those two measures in Germany but a larger acceptability of carbon-offsetting than paying higher prices for participants in the United States. Araña et al. (2013) test different frames that include a default manipulation of whether to opt-in or opt-out for offsetting of emissions resulting from conference participations. As in many other research fields, they find higher levels of participation (in carbon-offsetting) in the opt-out scheme.

donation decisions in the first place. Epperson and Reif (2019) review the experimental literature on matching schemes, and show that the evidence on the effects of matching rates in the context of charitable giving is mixed. The exogenous increase of donations through external matching might lead to crowding-out of donations in the sense that individuals give less themselves than in the case without matching. For instance, Karlan and List (2007) find a positive effect of 1:1 matching on donations, but no further effect of increasing the matching rate. Likewise, in the carbon-offsetting context, Kesternich et al. (2016) find a significant increase in the willingness to offset carbon emissions from a private long-distance bus trip only when a 1:1 matching scheme is in place, while higher and lower matching rates did not lead to higher participation rates in the long-term.

The large majority of studies in this area so far has focused on the effects of matchings paid into the same project that receives the donations by the decision-maker. Only a few studies consider settings in which more than one charity is involved. One exception is the study by Adena and Huck (2017). In a field experiment on charitable giving to social causes, the authors observe higher charitable donations when these donations are matched to amounts paid to complementary projects compared to matching paid to substitutes to the original project. Also related are the studies by Ek (2017) and Filiz-Özbay and Uler (2019). They find that a 'stealing effect' occurs when one charity offers a rebate (i.e., a shift of donations from other charities towards the charity that offers a rebate) but that this stealing effect is much smaller when the charitable projects are less substitutable. Similar mechanisms might be in place in the domain of co-benefits donations for climate protection projects: one could expect that co-benefits might be more likely to motivate additional donations to CCM projects, the larger the degree of complementarity of the specific co-benefits to the original project. Contrary to the previous literature in this area, we vary the degree of substitutability between the project serving as co-benefit and original project in our Experiment 2 and analyze in a controlled way whether individual contributions are correlated with the perceived substitutability of these projects. In our setting, we focus on types of co-benefits that are typically emphasized by charities in

project descriptions for potential donors: co-benefits in the climate, environmental, social and economic domain.[4]

In both experiments we find that co-benefits have a positive and significant effect on individual contributions towards climate change mitigation. In Experiment 1, using a between-subjects design, we find that donations increase by about 10 % when participants receive qualitative information about the co-benefits of the CCM project. A similar effect is found in Experiment 2 that is implemented as a within-subjects design with co-benefits implemented as additional donations into other projects. Here, this positive effect is the larger, the stronger participants' preference for the respective co-benefit. Finally, we observe that the positive effect is also found when people's responsibility is rendered salient and that the majority of participants choose to get informed about the co-benefits that arise from a CCM project. We conclude that co-benefits might be an important factor when promoting climate mitigation efforts and that potential donors might be triggered to contribute by co-benefits that match their individual preferences.

The remainder of the paper is organized as follows: section 2 describes the design and implementation of both experiments as well as our proposed hypotheses. In section 3 we report our results of the two experiments. Section 4 discusses the results and concludes.

2. Experimental Design, Implementation and Hypotheses

2.1. Experiment 1 – Design and Implementation

We conducted our first experiment in cooperation with the survey company *Respondi*. Participants were contacted via the company's subject pool and were invited to take part in a 20-minutes survey on digital technologies, daily habits and economic decision making. It was made sure that the participant pool was representative in terms of age, gender and place of residence within the German federal state of North-Rhine

[4] We include the climate co-benefit in this experiment to analyze donations to projects with additional benefits that are very similar to the effects of the main CCM project. However, we acknowledge that this does not correspond to the most original definition of a 'co'-benefit as this implies that the additional benefit is generated in a different domain.

Westphalia.[5] All subjects received a show-up fee according to the standard payment structure of the survey company (via so-called "Mingle Points" that can be redeemed in Euros). The fixed payment was 2 Euro and 10 % of subjects were randomly drawn at the end of the survey who received payments according to their decisions in the experiment.[6] In total, 1,200 individuals took part in our survey in the last week of November and first week of December 2020.

As one part of the survey, subjects had the opportunity to donate to a climate protection project, in this case the promotion of energy efficient stoves in Malawi, to decrease carbon emissions. We chose this project because it is an example for a typical CCM project offered by charitable organizations in this field. The project is provided via *climateneutralnow*, which is the carbon-offsetting fund of the United Nation Framework Convention for Climate Change (UNFCCC). According to *climateneutralnow*, 79 kilograms of CO_2 can be reduced for each Euro donated. Participants received an endowment of 25 Euro, which they could distribute between themselves and the CCM project. These donations were realized if this donation decision was randomly drawn at the end of the survey (see also Footnote 6).

We split our sample in three treatment groups of about 400 participants each. In the control group, subjects were only informed about the main characteristics of the CCM project, i.e. the carbon emission reductions resulting from the donations. In contrast, subjects in the first treatment ("Co-benefits") received additional information about the co-benefits of the CCM project. Specifically, subjects were informed that the installation of energy efficient stoves also tackles *social*, *environmental* and *economic* goals in the project countries. With this experimental variation, we aim to measure the causal effect of the co-benefits information on individual donations (see Table 1 for details).

[5] Our survey was conducted as part of the *Virtual Institute Smart Energy (VISE)* and it contributed to a wider range of research questions of this project. As the VISE deals with questions on regional development of the German federal state of North-Rhine Westphalia, participants were chosen to be representative for this region. However, these characteristics are very similar to the average German population.

[6] They were either paid according to their donation decision or according to risk preference or intertemporal preferences elicitation tasks.

In the "Choice" treatment, we investigate to what extent potential donors request additional information on co-benefits when they have the choice, and what the implications are for donations to the CCM project. This provides insights about the demand for information about co-benefits.[7] In our setting, transaction costs for receiving the information were actually minimal as subjects would be redirected to an information screen by clicking a button on the original screen. Table 1 gives a brief overview of the description for the donation decision by treatment. The full text can be found in the Appendix.

Table 1. Treatment overview of Experiment 1.

<table>
<tr><th>Treatment</th><th colspan="2">Description of donation decision</th></tr>
<tr><td>Control</td><td colspan="2">"With every Euro you donate to the climate protection organization, about 79 kg of CO_2 can be saved. The savings are achieved because the organization uses the donated money to promote energy-efficient stoves in Malawi."</td></tr>
<tr><td>Co-benefits</td><td colspan="2">Control + "Beyond the climate protection contribution, the project also has positive effects on the local social, environmental and economic development. A brief overview of these additional benefits: Social: … (education, health, gender), Environmental: … (local ecosystem, biodiversity, soil protection), Economic: … (jobs and savings for families)."</td></tr>
<tr><td rowspan="2">Choice</td><td colspan="2">Control + "Would you like to learn more about additional benefits of the climate protection project before you make a decision?" (binary choice)</td></tr>
<tr><td>Answer: "Yes" → Same information as in treatment "Co-benefits" prior to donation decision</td><td>Answer: "No" → No further information before donation decision</td></tr>
</table>

2.2. Experiment 2 – Design and Implementation

The goal of our first experiment is to investigate whether information on typical co-benefits in mitigation projects can increase donations for climate protection. In that first experiment, we provide qualitative information on co-benefits to subjects. This resembles the way information on co-benefits is presented to potential donors on the charities'

[7] In principle, potential donors might also strategically avoid information about co-benefits, in order not be motivated to donate (see for example Dana et al. 2007 and Grossman and van der Weele 2017).

websites so that the donation decision here was similar to the project presentations of real carbon-offsetting funds. At the same time, due to this qualitative information, donors might form very different beliefs on the absolute size of co-benefits in different domains. In addition, in practice donors often receive information on different kinds of co-benefits making it impossible to infer which characteristic of the co-benefits drives the additional motivation to donate. To replicate the potential positive effect of co-benefits for donations while fixing subjects' beliefs about the size of co-benefits and to find out more about how donors respond to specific characteristics of co-benefits, we conducted our second artefactual field experiment. Again, we cooperated with the survey company *Respondi* to recruit 1,200 subjects that are representative for the entire German population in terms of age, gender and federal state.[8] On average, subjects took about 15 minutes to complete the survey. All subjects received a fixed payment according to the standard payment structure of the survey company, which equals 1 Euro paid in "Mingle Points". In addition, 20 % of all participants were randomly selected for an additional payoff. One of their donation decisions (see below) was randomly drawn at the end of the survey to be actually carried out. Data collection took place in the first week of April 2021.

Compared to our first experiment, the setting was more abstract: again, subjects received an additional endowment of 12 Euro and were given the opportunity to donate for a CCM project. This time, however, co-benefits were introduced in the form of a linear matching scheme; we added an amount of 0.50 Euro on top of every 1.00 Euro donated to the CCM project. In this experiment, subjects could donate to a climate change mitigation project that buys CO_2 certificates and deletes them from the EU ETS system, thus making sure that for every Euro, 16 kilograms of CO_2 would not be emitted into the atmosphere. These carbon-offsets were carried out by the charitable non-profit organization *Compensators*.[9] We conducted altogether seven within-subject treatments.[10] Six of these

[8] In the survey, participants provided their choices on climate change mitigation in a first part. In addition, in a second part of the survey they answered questions on the mitigation behavior of others and in a third part, they were to provide their assessment regarding different kinds of energy products. This paper focusses on the results of the first part only.
[9] For more information on this organization, see https://www.compensators.org/en/about-us/.

treatments varied whether or not a co-benefit existed and the specific type of co-benefit. In addition to a standard matching scheme similar to related studies on charitable giving, we conducted treatments in which the additional donation of 0.50 Euro per Euro donated was not paid to the same CCM project but to other charitable causes, such as climate, social, environmental, or economic projects.[11] This mimics the idea of co-benefits – donations to CCM projects result in positive extra effects not directly related to climate protection. With this matching strategy, we can measure the effects of co-benefits in a controlled way and analyze how the specific nature of a co-benefit affects donation decisions.

To test the willingness of subjects to become informed about co-benefits also in this experiment, in the seventh treatment, we introduced uncertainty about whether or not a co-benefit existed. Specifically, participants were informed that in this variant there would be a co-benefit of donations with 50 % probability; all types of co-benefits were equally likely in this case. Subjects could reveal without cost whether the CCM project was associated with co-benefits and if so, with which type of co-benefit. As it was uncertain here whether a co-benefit existed or not, Experiment 2 introduced a larger degree of uncertainty than Experiment 1.

The sequence of tasks in our experiment was as follows: After answering questions on basic personal characteristics, subjects were asked five questions on their habits in

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[10] Generally, within-subjects treatments might give rise to experimenter demand effects due to the fact that the difference between treatments are made salient and thus might make subjects behave in a way that they perceive as desired by the experimenter. Yet, in our setting, we believe that the role of experimenter demand effects is limited: With the within-subject variations, we are mainly interested in how the nature of co-benefits influence donor decisions, and there is no clear ex-ante difference in the perceived desirability of a specific co-benefit, making it unlikely that treatment differences in donations associated with different co-benefits are driven by subjects' willingness to meet experimenter demands. Moreover, the within-subject variation more closely resembles real-world choices of CCM projects, as charitable organizations typically offer a list of projects with varying co-benefits from which donors can choose.

[11] All of these 'co-benefits projects' are carried out by *MISEREOR*, a clerical NGO that focuses on the promotion of development worldwide. The project with 'climate' benefits promotes renewable energies by installing solar panels in the Democratic Republic of Congo. The 'environmental' project preserves biodiversity and fertile soils by establishing forest gardens in Haiti. As part of the 'social' project, emergency shelters are built for the homeless in India. The 'economic' project creates vocational training places in Vietnam. For more information on these and other projects by *MISEREOR*, see Misereor.org. In order to make projects differ only in respect to the nature of their co-benefit, participants received a stylized description, which does not contain specific information on the projects (see Table 2 for details).

various domains of their life. Here, we introduce a (between-subjects) treatment variation to investigate the role of the perceived responsibility of subjects for the donations to CCM projects: in the "Carbon-offsetting" treatment, the questions tackled climate related behavior, such as individual habits on nutrition, mobility and general consumption. These questions were framed as a measure to give a rough idea of individuals' personal carbon footprint, a common measure in practice to calculate one's environmental externality measured in tons of CO_2. In addition, all decisions in this treatment were framed as donations that can reduce one's personal carbon footprint. The goal of this manipulation was to make individual carbon footprints salient and thus increase feelings of responsibility for environmental externalities.[12] In contrast, subjects in the "Donation" treatment were confronted with five questions on their behavior in a domain unrelated to climate protection (here, social media consumption). Moreover, all choices here were framed as donations for climate protection with no reference to one's personal responsibility or carbon footprint.

A summary of all treatments (between- and within-subjects) is shown in Table 2. The first six within-subjects treatments were shown to participants in random order and the seventh treatment ("Random co-benefit") involving uncertainty about co-benefits was always presented last. In addition, we elicited individual preferences for the specific charitable projects used as co-benefits as well as subjects' assessments of the similarity of these projects to the main CCM project. After the experimental treatments were finalized, individuals made four donation choices; again, they could decide how to donate from an endowment of 12 Euro to each of the projects that served as co-benefits in the first part of the experiment (without simultaneously buying carbon certificates). The direct donations allow us to later control for the individual heterogeneity in preferences for the specific projects. Beliefs about the similarity of the co-benefit projects to the main CCM project were elicited by the survey question "How similar do you perceive the goals and impacts of the following projects to 'buying carbon certificates'?" measured on a 7-point Likert scale.

[12] To ensure comparability between the two treatment variations, participants did not receive feedback about their personal carbon footprint after the survey.

Table 2. Treatment overview of Experiment 2.

Treatment	Description	
Introduction (all treatments)	Treatment "Donation": "[…] How much would you like to donate to buy carbon certificates?"	Treatment "Carbon-offsetting": "[…] How much would you like to donate to buy carbon certificates in order to reduce your personal carbon footprint?"
T1: No matching (baseline)	"In this variant, we do not donate additional money to other projects."	
T2: CO_2 matching	"In this variant, for each Euro you donate, we add another 50 cents as an additional donation to buy carbon certificates."	
T3: Climate co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **a climate protection project** that reduces carbon emissions (by promoting renewable energies)."	
T4: Environmental co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **an environmental protection project** (to preserve biodiversity and fertile soils)."	
T5: Social co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **a social project** (help for street children and emergency shelter for the homeless)."	
T6: Economic co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **an economic project** (creation of vocational training places)."	
T7: Random co-benefit	"In this variant, it is **randomly drawn** whether we donate another 50 cents for each Euro you donate. The probability that there is an additional donation is 50 %. Which of the projects you already know will receive the additional donation is also chosen at random (with equal probability for each project). Would you like to know if your donation triggers an additional payment and which project receives it?	

2.3. Expected behavior

The starting point for our study is the conjecture that the existence of co-benefits associated with a CCM project increases the motivation of a potential donor to contribute to this project. The predictions for behavioral responses to the introduction of co-benefits depend on the underlying assumptions concerning individuals' motivations to donate. Several frameworks from previous studies provide indications for donor behavior in the presence of co-benefits in our setting.

First, in the context of charitable giving, the motivation to donate can be captured by models of impure altruism (Andreoni 1989, Andreoni 1990, Karlan and List 2007). Here, a donation is modeled as a contribution to a public good; donors gain utility from private consumption, total donations to the public good (or the charity) – resembling altruistic motives – and from the act of contributing to the charity themselves irrespective of the outcome ("warm glow").

As discussed above, co-benefits increase the positive impact of donations to CCM projects on top of direct CO_2-reduction and thus can be thought of as additional contributions to the public good. Hence, concerning the effects of co-benefits on donations, similar arguments apply as in case of standard monetary matching where for every donated US-Dollar or Euro, an additional amount is added to the donation (see, for instance, Karlan and List 2007). If donors are partially motivated by altruism (and thus experience a utility gain from contributions to charitable causes), adding a co-benefit to the CCM project decreases the price of contributing to the public good and thus might make donations more attractive relative to the case without co-benefits. As the result, co-benefits might increase donations to the CCM projects in both experiments (*Hypothesis 1*).[13]

The additional effect of co-benefits on donations relative to standard matching might be positive or negative, depending on how much the addition of the co-benefit decreases the price of the contribution to the public good from an individual's perspective. Similar to the argument related to *Hypothesis 1*, a stronger individual preference for a given co-benefit project might make the donation to the public good relatively cheaper. Transferred to the setting of our Experiment 2, we therefore expect that donors' revealed preferences for specific charitable causes are positively correlated with donations for the CCM project when matching to the respective project is added as co-benefit (*Hypothesis 2*). As described in the previous section, to measure the donors' preferences for the different charitable causes in an incentivized way, we elicit direct donations to each

[13] In general, matching to the CCM project either through additional donations or through co-benefits might in principle also decrease donations, depending on the effect of the co-benefit on the donor's marginal utility from contributing to the public good.

project that we use as co-benefit after subjects have made their contributions to the CCM projects.

Third, the degree of substitutability between the CCM project and the co-benefit project might also matter for the donor's response to the specific types of co-benefits: Adena and Huck (2017) propose a model in which individuals care about donations to different charitable projects and provide evidence that a complementarity between the project that receives donations and the project that receives the matching triggers stronger positive responses to matching schemes. In our setting, this notion would imply that a lower perceived substitutability between the CCM project and the co-benefit project would be associated with higher donations to the CCM project (*Hypothesis 3*).

Fourth, we hypothesize that the treatment that highlights the individual responsibility for environmental pollution is associated with higher donations relative to the treatment where responsibility is not made salient (*Hypothesis 4*). As discussed in the previous section, making individual responsibility salient might trigger feelings of guilt that can be mitigated by investing into the CCM project to mitigate one's negative environmental impact (e.g., Gneezy et al. 2014, Jakob et al. 2017, Stehr and Werner 2021). Moreover, reminding potential donors of the environmental damage they have caused should weaken feelings of diffused responsibility, thus triggering higher donations to the CCM project.[14]

3. Results

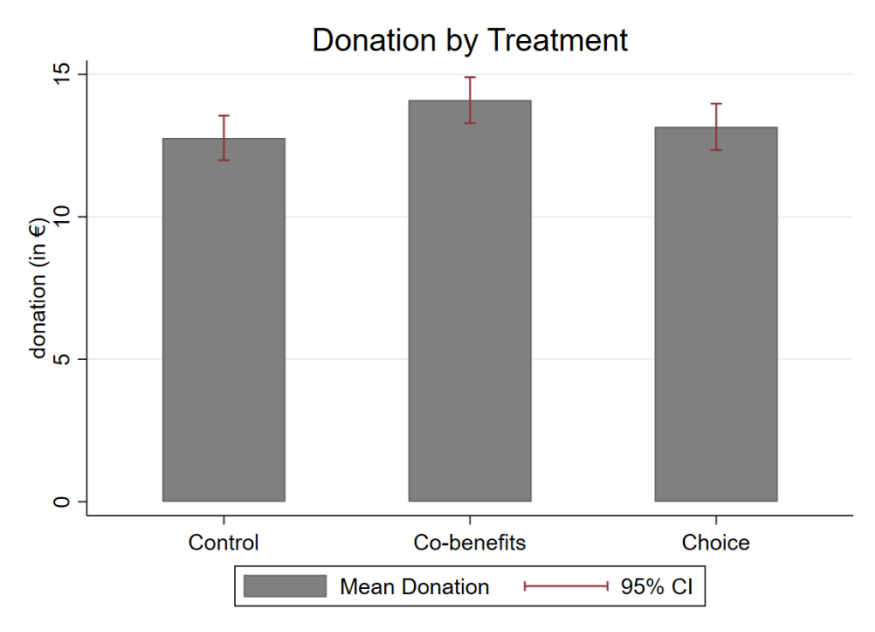
3.1 Experiment 1

It was made sure via our sampling strategy that participants are representative in terms of gender, age and place of residence within the German federal state of North-Rhine Westphalia. Table A.1. in the Appendix provides the results of our randomization check, indicating no differences in the main personal characteristics between the two treatments

[14] Note that we do not have an ex-ante hypothesis about the interaction between individual responsibility and the introduction of co-benefits. In principle, perceived responsibility for environmental damages should increase donations irrespective both in the presence and in the absence of co-benefits.

and our control group ($p > 0.10$ for each personal characteristic). There is parity in gender, subjects are on average 43 years old, and they live in all parts of the German federal state of North-Rhine Westphalia (the state with the most inhabitants in Germany – in the year 2020, 22 % of the German population lived there). Education is measured on a 7-point scale (from 1 = no degree to 7 = doctorate), with most subjects owning a secondary school leaving certificate (education = 4) or a high school certificate (education = 5).

Figure 1: Mean donation by treatment of Experiment 1.



Note: Average donations to the carbon-offsetting project (in Euro), by treatment in Experiment 1. Whiskers indicate 95 % confidence intervals.

Figure 1 shows average donations for the climate protection project separately for the three experimental treatments. In line with *Hypothesis 1*, we find that donations increase when subjects are informed about the co-benefits of the CCM project: average donations rise by about 10 % due to the provision of the co-benefits information (14.01 Euro vs. 12.77 Euro). This effect is statistically significant ($p = 0.02$, using a two-sided Mann-Whitney U-test (MWU-test)). Considering the extensive margin, we do not find significant differences between the "Co-benefits" and the control group: the share of donors is large in both treatments and only marginally higher in the "Co-benefits" treatment (91.1 %) than in the control group (90.5 %, $p = 0.77$, Chi-square-test). The picture is less clear for our second treatment variation where participants had the choice

to receive the additional information on co-benefits. In the "Choice" treatment, average donations account for 13.16 Euro, and they neither differ significantly from the control group ($p = 0.49$, MWU-test), nor from the "Co-benefits" treatment ($p = 0.13$, MWU-test). The share of donators is also similar to the control group (89.9 %, $p = 0.78$, Chi-square-test) and to the "Co-benefits" treatment ($p = 0.57$, Chi-square-test). In the next step, we take a closer look at those participants who obtain the information on co-benefits and compare their donations with the donations of those who choose to stay uninformed.

In our sample, the majority of the subjects (228 out of 407 or 56 % of the sample) decide to ask for the additional co-benefit information. Donations are considerably higher for those who decided to receive the additional co-benefit information as compared to those who do not view information, on average by about 38 % (14.95 Euro vs. 10.87 Euro, $p < 0.001$, MWU-test). Also, comparing donations of informed and uninformed participants to donations in the control group (12.77 Euro) reveals that informed participants (uninformed participants) pay significantly more (less) to the CCM projects than subjects in the control group (both $p < 0.01$, MWU-tests).

The observation that subjects who choose to get informed about the co-benefits transfer more than subjects in the control group is in line with the conjecture that some potential donors care about co-benefits of CCM projects, and, conditional on the presence of co-benefits, are willing to increase their donations. At the same time, the observation that uninformed subjects in the "Choice" treatment transfer less might be due to two reasons: participants who stay uninformed might donate less because they care less about CCM projects and the associated co-benefits per se. At the same time, the lower transfers might be explained by the 'moral wiggle room' created by the fact that subjects have to become active to receive information on co-benefits: participants who are reluctant to donate to the CCM project might actively avoid the information about the additional positive impact of the CCM project to use the lack of information as an excuse not to contribute (see, for instance, related evidence for the detrimental impact of moral wiggle room for prosocial behavior starting with the seminal study by Dana et al. 2007). Our setting does not allow to distinguish between these motivations. However, the result that the "Co-benefits" treatment triggers more donations than control whereas the "Choice" treatment

does not may indicate that some participants stay strategically uninformed to refrain from giving.[15]

In the next step, we make use of linear regression models to investigate the correlates of donations. The money invested into the CCM project is the dependent variable (Table 3 lists the results). In the first model, we include only dummy variables for our treatments; the control group without information on co-benefits serves as the reference condition. As in our non-parametric analysis, providing co-benefit information increases donations for climate protection while there is no significant overall effect in the "Choice" treatment. This main finding persists when controlling for demographic characteristics, i.e. gender, age and education. Age and education are split at the median, thus, subjects who are older than 43 years count as relatively old and all subjects with a high school degree or a higher education level are considered as highly educated. As indicated in Model 2, we find higher average donations for female, older, and well-educated participants.[16] Our results on demographics are in line with previous results on prosocial behavior: in the meta-studies on dictator games by Engel (2011) and Bilén et al. (2021), as well as in the study by Falk et al. (2018) that elicits economic and social preferences in 80 countries, female participants are found to be more altruistic. Moreover, Engel (2011) finds that dictator giving is positively associated with age and also Falk et al. (2018) find a weakly increasing relation between age and altruism in OECD countries. Falk et al. (2018) further report a positive correlation between self-reported cognitive ability and a participant's altruism. Regarding the specific case of sustainable behavior, our results are also mostly in line with the literature. Löschel et al. (2013), Diederich and Goeschl (2014) and Schwirplies et al. (2019) also find a higher willingness to pay of more

[15] Two recent studies by Lind et al. (2019) and Momsen and Ohndorf (2020) explicitly analyze in laboratory experiments whether subjects exploit moral wiggle room in the environmental domain. Lind et al. (2019) investigate in a dictator game with imperfect information on the payoffs of the recipient whether subjects seek to reveal this information or if they prefer to stay uninformed. This design builds on Dana et al. (2007) but the authors replace the second player with an environmental organization. Momsen and Ohndorf (2020) test whether subjects strategically avoid information on the externalities of products in green market settings. Both studies do not find evidence for subjects to strategically avoid information when information – as in our setting – is costless.

[16] Making use of Wald-tests to compare the effectiveness of both treatments, we do not find a statistically significant difference between the "Co-benefits" and the "Choice" treatment coefficient ($p = 0.11$ in specification 1, $p = 0.12$ in specification 2).

educated individuals. Our positive coefficient for female subjects is in line with Diederich and Goeschl (2014) whereas Löschel et al. (2013) and Schwirplies et al. (2019) find no significant differences in contributions conditional on gender. However, the tendency for older subjects to donate more for the CCM project stands in contrast to previous studies that mostly find stronger pro-environmental behavior of younger participants (Löschel et al., 2013; Schwirplies et al., 2019).

Table 3. Determinants of donation decisions.

	(1) Donation	(2) Donation
Co-benefits	1.32**	1.33**
	(0.58)	(0.57)
Choice	0.39	0.44
	(0.57)	(0.57)
Female		2.14***
		(0.46)
Age		0.82*
		(0.48)
Education		2.25***
		(0.49)
Constant	12.77***	9.93***
	(0.41)	(0.63)
Observations	1,200	1,200

*Note: OLS estimates in linear regression models of Experiment 1. Dependent variable: Donations for CCM project in Euro. Standard errors in parentheses. Variables 'Age' and 'Education' are split at the median. * p < 0.1, ** p < 0.05, *** p < 0.01.*

In addition, we analyze whether personal characteristics explain the decision to request the additional co-benefits information in our "Choice" treatment making use of linear probability models. We find no significant correlation of gender, age or education level. Hence, the choice to request information about co-benefits is not significantly associated with demographics in Experiment 1 (see Table A.2. in the Appendix for details).

3.2 Experiment 2

As in Experiment 1, we conduct our artefactual field experiment with a sample that is representative of the German population in terms of age, gender, education and federal state of residence. Again, there are no systematic differences between subjects' main characteristics in the two between-subjects treatments ("Carbon-offsetting" and

"Donation"), as shown in Table A.3. in the Appendix ($p > 0.10$ for each personal characteristic). Subjects are on average 46 years old and 49 % of them are male. Most subjects have a secondary school diploma (which equals a 3 on the 5-point education scale used in this experiment which ranged from 1 = no school certificate to 5 = university degree).

Average contributions to the CCM project in the six treatments with full information about the existence of co-benefits are shown in Table 4. The treatment that induces ex-ante uncertainty about the existence and nature of the co-benefit is discussed separately at the end of the section. The average donation in the baseline treatment without any matching accounts for 3.34 Euro (out of a maximum donation of 12 Euro). Importantly, we find that all matching schemes increase individual contributions, irrespective of the project that receives additional money ($p < 0.01$ for all treatments using two-sided Wilcoxon signed-rank tests, see fourth column of Table 4). This increase is also economically significant in our setting - matching shifts donations upward by between 14 % to 42 % relative to our baseline condition with no matching. We hence do not find evidence for a crowding-out of individuals' donations through external matching on average in any of our treatments. Overall, we can confirm *Hypothesis 1* also in our second experiment: the inclusion of co-benefits increases donations for the CCM project.

Table 4. Average donations by within-design treatments.

Treatment	Donation (in Euro)	%-change to No matching	p-value	%-change to CO_2 matching	p-value
No matching	3.34	Baseline			
CO_2 matching	3.84	14.9	< 0.01	Baseline	
Climate co-benefits	4.40	31.7	< 0.01	14.6	< 0.01
Environmental co-benefits	4.60	37.5	< 0.01	19.7	< 0.01
Social co-benefits	4.75	42.1	< 0.01	23.6	< 0.01
Economic co-benefits	3.81	14.1	< 0.01	-0.7	0.84
Observations	1,200			1,200	

Note: p-values are calculated using two-sided Wilcoxon signed-rank tests.

Comparing the standard matching scheme ("CO_2 matching") with the co-benefit treatments, we find that matching to *social*, *environmental* and *climate* projects significantly increase individual contributions relative to standard matching (between 15 % and 24 % depending on the treatment, for all cases $p < 0.01$, Wilcoxon signed-rank

tests). However, there is no significant difference between matching to an *economic* project and the standard matching scheme ($p = 0.84$, Wilcoxon signed-rank test). Calculating the average donations across all four co-benefit treatments indicates that donations are significantly higher for co-benefits matching than for CO_2 matching (4.38 Euro vs. 3.84 Euro, $p < 0.01$, Wilcoxon signed-rank test).[17]

In the next step, following our *Hypotheses 2* and *3*, we analyze the role of individual preferences for the different co-benefits and people's beliefs about the substitutability of the projects implemented as co-benefits. Average donations to the specific charitable projects and assessments of their similarity to the CCM project are presented in Table 5.

Table 5. Direct donations and perceived similarity of co-benefit projects

Treatment	Average donation (in Euro)	Similarity to CCM project (buying CO_2 certificates)
Climate project	4.30 (0.11)	4.96 (0.05)
Environmental project	4.79 (0.12)	4.36 (0.05)
Social project	5.08 (0.12)	2.89 (0.05)
Economic project	3.58 (0.11)	3.03 (0.05)
Observations	1,200	1,200

Note: Similarity is measured on a 7-point Likert scale (1=not similar at all, 7=very similar). Standard errors in parentheses.

First, focusing on donations to the different charitable projects, we observe the same treatment order as in our main treatments where matching to these projects is included as co-benefits: the social project receives the highest average donations, followed by

[17] As described in the previous section, treatments were presented to subjects in a random order. If we only consider the cases where a participant was presented with a given treatment in the first round, we find, similar to the overall results, that average donations are higher both under standard matching and under the different co-benefit treatments (Table A.4 in the Appendix lists average donations). Yet, the differences tend to be less strongly pronounced if we only look at round 1 data, and differences to the baseline treatment without matching are not statistically significant in all cases (CO_2: $p = 0.62$; Climate = 0.03; Environment: $p = 0.21$; Social: $p < 0.01$; Economic: $p = 0.33$; all two-sided MWU tests comparing donations in the respective treatment to donations in the "No matching" treatment).

environmental and climate projects while the lowest donations are found for the economic project. The observation that direct donations and responses to co-benefits show the same qualitative pattern provides a first indication that project preferences of individuals seem to drive the positive responses to co-benefits, in line with our *Hypothesis 2*.

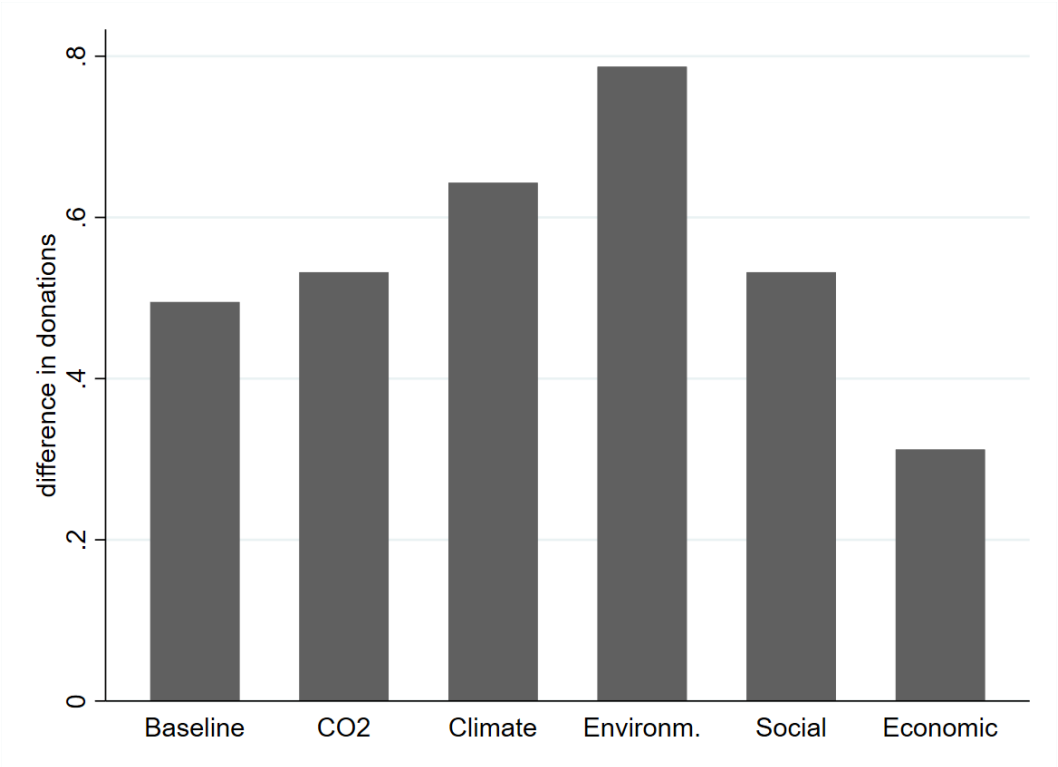
Second, with respect to the beliefs about project similarity, as one may expect, the climate protection project is seen as most similar to the purchase of carbon certificates in the CCM project (4.96 on a 7-point scale), followed by the environmental project (4.36). The economic and the social project are considered as less similar to the CCM project (3.03, respectively 2.89). Comparing direct donations (and also donations to the CCM project with co-benefits) to perceived project similarity, we find a reversed pattern for the climate, environmental, and social project in the sense that higher donations are associated with lower perceived substitutability of the project and the original CCM project. However, this finding does not hold for the economic project because it is rated lowest on the similarity scale but at the same time receives the lowest donations on average. Hence, overall, we do not find clear evidence for *Hypothesis 3* that the substitutability of the projects may drive donations in the presence of co-benefits.

Turning in the next step to the behavioral responses to the difference in the framing of the donation decision (either offsetting one's negative environmental impact or donating to the CCM project), we find that participants pay more to the CCM project when their individual responsibility for environmental damages is made salient. Calculated over all within-subjects treatments, individuals donate 4.40 Euro in the responsibility condition compared to 3.85 Euro in the standard donation condition (a plus of 14 %, $p = 0.046$, two-sided MWU-test), corroborating *Hypothesis 4* that higher perceived responsibility increases donations.

As shown in Figure 2, emphasizing subjects' personal emissions and framing their contributions as carbon-offsets increases donations irrespective of the co-benefit type. The difference in donations (in Euro) between the "Carbon-offsetting" and the "Donation" treatment is positive for each within-subject treatment and ranges from 0.31 Euro ($p = 0.41$, MWU-test) in the treatment with economic co-benefits to 0.79 Euro in the

treatment with environmental co-benefit ($p < 0.01$, MWU-test). The average difference between donations in "Carbon-offsetting" and "Donation" treatment is particularly pronounced in the matching schemes with environmental and climate related co-benefits (0.64 Euro; $p = 0.02$, MWU-test). This seems intuitive given the emphasis of subjects' personal responsibility with regard to climate and environmental related topics in the carbon-offsetting treatment. For the other treatments, the difference in donations between "Carbon-offsetting" and "Donation" treatment is also statistically significant in "CO_2 matching" treatment (0.53 Euro; $p = 0.04$, MWU-test), but only marginally significant in the "No matching" (0.50 Euro; $p = 0.06$, MWU-test) and the "Social co-benefit" treatment (0.53 Euro; $p = 0.08$, MWU-test).

Figure 2. Differences in donations by "Carbon-offsetting" treatment.



Note: Dependent variable: Mean difference of donations in Euro (=donations in treatment "Carbon-offsetting"– donations in treatment "Donation"), for each within-design treatment.

Next, in order to test the robustness of these descriptive results in parametric analyses and to take into account individual heterogeneity of donors, we make use of linear regression models with the donations to the CCM project as the dependent variable, clustering

standard errors on the level of an individual subject (see Table 6). In Model 1, we explain donations by treatment dummies and subjects' demographic characteristics (as before, age and education are split at the median). In Model 2 and 3, we analyze the effects of the co-benefit treatments on the extensive and the intensive margin. Therefore, we run a linear probability model that explains the probability to donate (Model 2) and a model with the donation in Euro conditional on donating positive amounts (Model 3), using the same control variables as in Model 1 in both specifications. In Model 4, we restrict our sample to the co-benefit treatments that include a matching to other projects than the purchase of carbon certificates, i.e. our co-benefits treatments. Here, we analyze how subjects' project preferences and their beliefs about the substitutability of the projects to buying certificates affect donations.

The results of Model 1 confirm our observations of the non-parametric analyses: each matching scheme increases donations for climate protection compared to the baseline treatment without matching donations, which corroborates *Hypothesis 1*. Moreover, *ceteris paribus* subjects donate 59 cents more when their contributions are framed as carbon-offsets than if they are described as mere donations. This again speaks for the relevance of the salience of subjects' personal responsibility, as expected according to *Hypothesis 4*. Similar to the results of Experiment 1, males tend to donate less, and higher educated participants donate more. Subjects' age is not significantly correlated with average donations in our sample.

Model 2 shows the results on the extensive margin. Compared to the baseline treatment without matching, all of our matching treatments increase the probability to donate. Regarding controls, male, older, and less educated subjects donate less often than their counterparts. In contrast, the effect of the standard matching treatment (CO_2) and of the economic co-benefit treatment vanishes on the intensive margin (see Model 3). Males and less educated subjects again donate lower amounts. Given subjects donate at all, older subjects donate higher amounts, on average 62 cents more than the younger half of the sample. Interestingly, the carbon-offset frame seems to change donations mainly on the intensive margin; there is no significant treatment effect of highlighting individual responsibility on the probability to donate to the CCM project.

Table 6. Determinants of donations.

	(1) Donation	(2) P(donate)	(3) Donation (if donation > 0)	(4) Donation
CO_2 matching	0.50***	0.09***	0.06	
	(0.06)	(0.01)	(0.09)	
Climate	1.06***	0.13***	0.50***	
	(0.07)	(0.01)	(0.10)	
Environmental	1.25***	0.16***	0.52***	
	(0.08)	(0.01)	(0.10)	
Social	1.40***	0.16***	0.74***	
	(0.08)	(0.01)	(0.11)	
Economic	0.47***	0.10***	-0.06	
	(0.07)	(0.01)	(0.10)	
Carbon-offset	0.59***	0.01	0.73***	0.61***
	(0.21)	(0.02)	(0.21)	(0.22)
Male	-0.86***	-0.07***	-0.62***	-0.95***
	(0.21)	(0.02)	(0.21)	(0.21)
Age	0.13	-0.06**	0.62***	0.21
	(0.22)	(0.02)	(0.22)	(0.22)
Education	1.06***	0.07***	0.95***	1.10***
	(0.22)	(0.02)	(0.22)	(0.22)
Preferences				0.37***
				(0.02)
Substitutability				0.02
				(0.02)
Constant	2.89***	0.64***	4.55***	3.91***
	(0.24)	(0.03)	(0.26)	(0.25)
Treatments	All	All	All	Co-benefit
Donation decisions	7,200	7,200	5,185	4,800

*Note: OLS estimates in linear regression models with standard errors that are clustered on the level of an individual subject. The `No Matching' treatment serves as baseline. 'Age' and 'Education' are split at the median. 'Preferences' and 'Substitutability' are normalized on an individual level. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01*

Finally, Model 4 sheds light on the role of subjects' project preferences and their perception of project substitutability for donations. As the assessment of substitutability and the level of donations is heterogeneous within subjects, we normalize both measures on an individual level. Thus, we generate a subject specific average for both measures

and subtract it from the respective assessment of each project. The variable for 'Preferences' thus indicates the deviation of subjects' preference for a given project from their own individual average project preference. Similarly, the 'Substitutability' variable measures the deviation of subjects' substitutability assessment of a given project from the individual average assessment of projects' substitutability. The estimates from model 4 show that donations for climate protection increase when they are combined with subjects' most favored charitable causes as co-benefits: in line with our *Hypothesis 2*.[18] However, there is no significant correlation of subjects' assessment of project substitutability and donations. Hence, we do not find evidence in line with *Hypothesis 3* that contributions decrease with higher project substitutability in our setting.

In the following subsection, we approach donor heterogeneity from a different angle and try to obtain a better understanding on how prevalent the positive responses to the introduction of co-benefits are in our sample. To this end, we define different types of subjects according to their reaction to the different matching treatments in comparison to the "No matching" treatment. Based on donation patterns, we identify six different types of subjects which are summarized in Table 7.

The first two types (Type 1 and Type 2) represent subjects that increase their donations when matching is provided, irrespective of the type of matching (in total 54.5 % of subjects). For these subjects, we thus observe a crowding-in of donations through matching. Subject Type 1 already donates a positive amount in the "No matching" treatment and on average further increases donations when matching is added (all matching treatments merged, "$D_{Matching}$"). In contrast, Type 2 contributes in the matching treatments only and donates nothing in the absence of matching. Within these two groups

[18] In order to find out whether project preferences are correlated with certain personal characteristics, we regress direct donations on subjects' demographics. The results of this analysis are presented in A.5 in the Appendix. First, we find that males and less educated subjects generally donate lower amounts, while we find no correlation of age and average donations. When regarding each project separately, the negative correlation of male as well as lower education and donations remains for each of the four projects. Moreover, we find a positive tendency for higher donations to the social project among older participants. Finally, we also test whether the "Carbon-offsetting" treatment affects direct donations to these additional projects. We find a positive effect of this treatment on direct donations only for the climate and environmental project. This seems plausible, as the salience of subjects' personal responsibility is increased in precisely these two domains.

we identify two subtypes of donors (Subtype 1 and Subtype 2) that are positively affected by our co-benefits treatments. These subjects show higher average contributions in the co-benefits treatments (all co-benefits treatments merged, "$D_{Co\text{-}Benefit}$") than in the standard matching scheme ("$D_{CO2\text{-}Matching}$"). In total, these two subtypes account for a substantial share of donors in our sample (about 39 % of all participants) who react positively to the introduction of co-benefits by increasing their donations.

Table 7. Response to co-benefits by subject types.

Type	Donation patterns	Share of participants (in %)
Type 1	$D_{No\ Matching} > 0$ & $D_{Matching} > D_{No\ Matching}$	31.0
Subtype 1	**$D_{No\ Matching} > 0$ & $D_{Co\text{-}Benefit} > D_{CO2\text{-}Matching}$**	**(22.2)**
Type 2	$D_{No\ Matching} = 0$ & $D_{Matching} > D_{No\ Matching}$	23.5
Subtype 2	**$D_{No\ Matching} = 0$ & $D_{Co\text{-}Benefit} > D_{CO2\text{-}Matching}$**	**(16.8)**
Type 3	$D_{No\ Matching} > 0$ & $D_{Matching} = D_{No\ Matching}$ & $Var_{Matching} = 0$	15.1
Type 4	$D_{No\ Matching} > 0$ & $D_{Matching} = D_{No\ Matching}$ & $Var_{Matching} > 0$	1.7
Type 5	$D_{No\ Matching} = D_{Matching} = 0$	14.8
Type 6	$D_{No\ Matching} > 0$ & $D_{Matching} < D_{No\ Matching}$	13.9

*Note: Classification of participants as donor 'types'. Donor types who react positively to the introduction of co-benefits are highlighted in **bold** font. Notation: $D_{No\ Matching}$ = Donation in the "No matching" (baseline) treatment. $D_{Matching}$ = Average donations in all treatments where contributions are matched (T2-T6). $D_{Co\text{-}Benefit}$ = Average donations in all co-benefit treatments (T3-T6). $D_{CO2\text{-}Matching}$ = Donation in the CO_2 (standard) matching treatment (T2). $Var_{Matching}$ = Variance in donations of all treatments where contributions are matched (T2-T6).*

The rest of our sample is divided into subjects who do not react to the introduction of matching (Types 3-5, in total 31.6 % of the sample) or reduce their contribution in the matching treatment compared to the baseline treatment without any matching (13.9 %, Type 6), the latter observation being in line with a crowding-out of donations through matching. Type 3 donates the same (positive) amount in all treatments (15.1 % of the sample), Type 4 subjects vary their donations but contributions in the matching treatments equal their baseline donation on average (1.7 % of the sample). Type 5 never contributes in any treatment (14.8 %). Overall, inspecting the different donor types in our experiment, the share of participants reacting positively to the introduction of our

matching schemes (Type 1 and 2, 54.5 %) is almost four times larger than those who reduce their contributions in the matching treatments (Type 6, 13.9 %).[19]

In a final step, we investigate the role of uncertainty about co-benefits for information revelation and donations in Experiment 2. As indicated before, there are some differences between this "Random co-benefit" treatment in Experiment 2 and the "Choice" treatment of Experiment 1. In the second experiment, it is not clear i) whether a co-benefit exists and subjects' donations will be matched and ii) which of the co-benefits projects described above receives the matching (if the donation is matched). Subjects were told that the probability of a co-benefit was 50 % and that each of the co-benefits projects was chosen with equal probability. As in Experiment 1, subjects could decide to eliminate this uncertainty or to take their donation decision without knowing whether or not a co-benefit to the project existed. Whether or not the differences in the uncertainty treatments trigger a stronger or weaker desire in Experiment 2 to become informed is ex-ante unclear. On the one hand, Experiment 2 creates higher uncertainty given that subjects do not know whether or not the co-benefit actually exists. Therefore, subjects who care about the co-benefits should be more inclined to request information compared to Experiment 1 where it is known that the CCM project is associated with some additional positive effect. Yet, the uncertainty about the existence of the co-benefit might increase moral wiggle room and thus make it easier from the perspective of a potential donor not to request information and to justify low or zero transfers to the CCM project. Hence, it is also unclear how average donations in this treatment change relative to the treatment with full information about the co-benefit in Experiment 2.

The results of our analysis on the "Random co-benefit" treatment are shown in Table 8. Qualitatively, we find similar patterns as in Experiment 1. Yet, the sizes of the effects differ across the experiments. First, we observe that only some 23 % of the participants do not want to be informed about the existence of a co-benefit. Thus, the large majority

[19] In an additional analysis, we investigate whether the likelihood to react positively to the introduction of co-benefits depends on subjects' demographic characteristics. The results of this analysis reveal that males are less likely to react to co-benefits while subjects' age and their education do not seem to play a role (see Table A.6 in the Appendix).

of the participants (77 %) decided to eliminate uncertainty. Those subjects were informed that their donation was indeed matched and that the *environmental* project was randomly drawn as a co-benefit.[20] As in Experiment 1, donations are significantly higher for informed subjects (5.58 Euro) than for uninformed subjects (1.89 Euro; $p < 0.001$, MWU-test), as is the share of participants with a donation > 0 (90 % vs. 37 %, $p < 0.001$, Chi-square-test). Here, informed subjects donate almost three times as much as uninformed subjects. The low contributions among uninformed subjects might be due to the higher degree of uncertainty about the existence and nature of co-benefits in Experiment 2 and the associated moral wiggle room, as described above. Average donations in this "Random co-benefit" treatment are 4.72 Euro, which is not significantly different from the treatment where all subjects are fully informed about the (environmental) co-benefits of their donation (4.60 Euro, $p = 0.12$, Wilcoxon signed-rank test). Likewise, the share of participants who donate a positive amount between those two treatments is almost identical ("Random co-benefit" = 77.3 % vs. "Environmental co-benefit" = 77.5 %, $p = 0.82$, Wilcoxon signed-rank test).

Table 8. Donations in the "Random co-benefit" treatment.

Treatment	Donation (in Euro)	P-Value	P (donation > 0)	P-value	N
Environmental co-benefit	4.60	0.12	77.5	0.82	1200
Random co-benefit	4.72		77.3		1200
Uninformed	1.89	< 0.001	37.4	< 0.001	281
Informed	5.58		89.6		919

Note: P-values result from Wilcoxon signed-rank tests (comparing donation behavior in "Environmental co-benefit" vs. "Random co-benefit" treatment), respectively from MWU-tests (comparing donation behavior of "Uninformed" vs. "Informed" subjects in the "Random co-benefit" treatment).

Finally, the decision to reveal information about the existence and the nature of co-benefits in this "Random co-benefit" treatment is significantly linked to subjects' personal characteristics. In contrast to Experiment 1 (and potentially related to the increased sample size in Experiment 2), we find a significantly higher probability to reveal uncertainty about the potential co-benefit for female, relatively young and rather highly educated individuals. In addition, adding a dummy indicating whether a decision

[20] The environmental co-benefit was randomly drawn before the start of the experiment. It was selected to be relevant for all participants to ensure comparability of the donations of informed participants.

maker is among those who react positively to co-benefits by increasing their donations ("Co-benefits respondents", consisting of Subtypes 1 and 2 as listed in Table 7), shows that they are significantly more likely to request information about the co-benefit than other participants, in line with a preference for being informed. The detailed analysis can be found in Table A.7 in the Appendix. As female and highly educated participants also donate higher amounts to the CCM project in the other treatments, the increased likelihood of obtaining information is in line with a higher preference for co-benefits among these participants.

4. Discussion and Conclusion

We have conducted two artefactual field experiments to study the impact of co-benefits on donations to CCM projects. We find that, both in a setting that provides qualitative information on co-benefits and in a setting in which we control for the role of the size and nature of co-benefits, donations for climate protection increase in the presence of co-benefits.

Our study provides a number of practical implications for the design and presentation of CCM projects in the field. First, contrary to results in the context of charitable giving, we find no systematic evidence that matching leads to crowding-out of donations on average in our second experiment. Hence, we have no indication that on average, co-benefits of CCM projects lower potential donors' willingness to donate to these projects. This absence of a crowding out effect might be partially driven by the fact that, as becomes apparent in our data, co-benefits seem to appeal to donors' preferences for charitable causes that differ from the goal of the main CCM project.

Second, and related to this point, we find that preferences for the different charitable projects are robustly correlated with contributions to the CCM project when they are implemented as co-benefits. In our experiment, *social* and *environmental* co-benefits have the strongest positive effect on individual contributions, regardless of differing in their degree of substitutability to the main climate change mitigation project. This observation suggests that a charity might profit from the knowledge about which co-

benefits are considered to be most attractive by potential donors which should then also be rendered most salient.

Third, we find that the majority of subjects in fact obtain the information on co-benefits in both experiments and thus seem to have a preference to learn about co-benefits. The relevant question from a charity perspective would be whether information on co-benefits should be made directly available or whether it should be left to potential donors to search for this information. In our first experiment, the treatment with exogenous information provision about co-benefits is associated with higher payments to the CCM project relative to the control condition whereas no significant positive shift in payments is found for the treatment in which participants can decide to collect the information themselves. In the second experiment, average donations to the CCM project increase significantly relative to the control condition, irrespective of whether information on co-benefits is provided or has to be obtained. Overall, the direct communication of co-benefits associated with CCM projects seems therefore to be preferable.

Finally, we find in our second experiment that making one's negative environmental impact salient to participants significantly increases donations to CCM projects. This effect is observed irrespective of the type of co-benefit. One implication is that the practice of some charitable organizations to offer potential donors the possibility to calculate their carbon footprint on their website (and thus, the emissions they are personally responsible for) might be a way to motivate donations to CCM projects. Also the offer to mitigate one's externalities directly when people are made aware of their individual responsibility (e.g. at the time when booking a flight) is in line with this idea.

Overall, our study provides controlled evidence that co-benefits may trigger higher donations for CCM projects. That said, we acknowledge that real-world CO_2 compensation projects differ widely in their efficiency, i.e. the reduction of CO_2 emissions associated with a given donation of the CCM project. The project efficiency may thus be an important determinant of the donors' decision. Yet, it remains unclear to what extent co-benefits might (partially) compensate for a lower project efficiency. Our study is not designed to shed light on how donors trade off the size of climate change mitigation effects against the existence and size of co-benefits. Having established that

co-benefits may have a positive impact on individuals' inclination to donate for a given climate protection efficiency of the underlying project, more detailed insights into these trade-offs might be a promising next step for future research.

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Appendix

A. Additional Results

Table A.1. Randomization check of Experiment 1.

	Total	Control	Co-benefits	Choice	P-value
Female	0.50	0.51	0.48	0.51	0.58
	(0.01)	(0.03)	(0.03)	(0.02)	
Age	42.7	43.5	42.2	42.3	0.37
	(0.39)	(0.68)	(0.71)	(0.65)	
Education	4.71	4.76	4.78	4.68	0.25
	(0.03)	(0.05)	(0.05)	(0.05)	
Observations	1200	400	393	407	

Note: Education is measured on a 7-point scale (from 1 = no degree to 7 = doctorate), with the median subject owning a secondary school leaving certificate (Education = 4). P-values resulting from a joint significance test of the coefficients attached to the treatment dummies, in regressions with the respective demographic characteristics as dependent variables. Standard errors in parentheses.

Table A.2. Determinants of the request for information on co-benefits in Experiment 1.

	(1) P (request information)
Female	0.02
	(0.05)
Age	-0.05
	(0.05)
Education	0.05
	(0.05)
Constant	0.54***
	(0.06)
Observations	407

*Note: OLS estimates in a linear probability model. Dependent Variable: probability to request the additional information on co-benefits in the 'Choice' treatment. Variables 'Age' and 'Education' split at the median. Standard errors in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A.3. Randomization Check of Experiment 2.

	Total	Carbon-offsetting	Donation	P-values
Male	0.49	0.49	0.50	0.77
	(0.01)	(0.02)	(0.02)	
Age	45.5	45.5	45.4	0.92
	(0.39)	(0.58)	(0.58)	
Education	3.6	3.6	3.6	0.58
	(0.03)	(0.04)	(0.04)	
Observations	1200	600	600	

Note: Education is measured on a 5-point scale (from 1 = no degree to 5 = university degree), with the median subject owning a secondary school leaving certificate (Education = 3). P-values resulting from a joint significance test of the coefficients attached to the treatment dummies, in regressions with the respective demographic characteristics as dependent variables. Standard errors in parentheses.

Table A.4. Average donations by within-design treatments – First donation decision only.

Treatment	Donation (in Euro)	%-change to No matching	p-value	%-change to CO_2 matching	p-value
No matching	3.90	Baseline			
CO_2 matching	3.96	1.5	0.62	Baseline	
Climate co-benefits	4.71	20.8	0.03	18.9	0.06
Environmental co-benefits	4.38	12.3	0.21	10.6	0.37
Social co-benefits	5.04	29.2	< 0.01	27.3	0.01
Economic co-benefit	4.18	7.2	0.33	5.6	0.60
Observations	1200			1200	

Note: p-values are calculated using two-sided Mann-Whitney U-tests.

Table A.5. Determinants of project preferences.

	(1) Preferences	(2) Climate	(3) Environment	(4) Social	(5) Economic
Carbon-offset	0.32	0.37*	0.57**	0.20	0.14
	(0.20)	(0.22)	(0.23)	(0.24)	(0.21)
Male	-0.83***	-0.70***	-0.67***	-1.32***	-0.65***
	(0.20)	(0.22)	(0.23)	(0.24)	(0.21)
Age	0.20	-0.05	0.22	0.57**	0.07
	(0.21)	(0.23)	(0.24)	(0.24)	(0.22)
Education	0.83***	0.97***	1.18***	0.69***	0.49**
	(0.21)	(0.23)	(0.24)	(0.24)	(0.22)
Constant	4.18***	4.01***	4.15***	5.01***	3.56***
	(0.23)	(0.26)	(0.26)	(0.28)	(0.25)
Observations	1,200	1,200	1,200	1,200	1,200

*Note: OLS estimates in linear regression models. Dependent variable: Specification 1 = Average donation to the additional benefits projects; Specification 2 - 5 = Donation to each of the additional projects separately. Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01*

Table A.6. Demographic background and responses to co-benefits

	(1) P (co-benefits responding)
Carbon-offset	-0.01
	(0.03)
Male	-0.06**
	(0.03)
Age	0.01
	(0.03)
Education	-0.02
	(0.03)
Constant	0.43***
	(0.03)
Observations	1,200

*Note: OLS estimates in a linear probability model. Dependent Variable: Likelihood to increase donations due to the introduction of co-benefits. Variables 'Age' and 'Education' split at the median. Standard errors in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A.7. Decision to reveal uncertainty in the 'Random' co-benefit treatment in Experiment 2.

	(1) P (reveal uncertainty)	(2) P (reveal uncertainty)
Male	-0.09***	-0.08***
	(0.02)	(0.02)
Age	-0.07***	-0.07***
	(0.03)	(0.02)
Education	0.07***	0.07***
	(0.03)	(0.02)
Carbon-offset	0.02	0.02
	(0.02)	(0.02)
Co-benefits respondents		0.15***
		(0.02)
Constant	0.80***	0.74
	(0.03)	(0.03)
Observations	1,200	1,200

*Note: OLS estimates in linear probability models. Dependent Variable: probability to reveal uncertainty on the co-benefit in the 'Random co-benefit' treatment (Experiment 2). Variables 'Age' and 'Education' split at the median. Standard errors in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.*

B. Experimental Instructions

Experiment 1 – Treatment Questions

"In the following, you can choose between different distributions of money between yourself and a climate protection organization. You will receive a total of 25 Euros and can decide how much of the money you want to keep for yourself and how much you want to give to the climate protection organization."

Treatment: "Control"

"With every Euro you donate to the climate protection organization, about 79 kg of CO_2 can be saved. The savings are achieved because the organization uses the donated money to promote energy-efficient stoves in Malawi."

Treatment: "Co-Benefits"

"With every Euro you donate to the climate protection organization, about 79 kg of CO_2 can be saved. The savings are achieved because the organization uses the donated money to promote energy-efficient stoves in Malawi.

Beyond the climate protection contribution, the project also has positive effects on the local social, environmental and economic development. A brief overview of these additional benefits:

Social: Time-consuming wood collection is no longer necessary for local families, so that this time can be used for education and other activities. activities. In addition, less smoke inside houses reduces respiratory diseases, which benefits women and children in particular. women and children benefit the most.

Environmental: Local forests are conserved due to reduced logging, which protects the local ecosystem and natural habitats for wildlife. In addition, the project contributes to the reduction of soil erosion.

Economic: The production and maintenance of the efficient stoves creates jobs in the region and Malawian families have to spend less money on cooking fuel."

Treatment: "Choice"

"With every Euro you donate to the climate protection organization, about 79 kg of CO_2 can be saved. The savings are achieved because the organization uses the donated money to promote energy-efficient stoves in Malawi.

Would you like to learn more about additional benefits of the climate protection project before you make a decision?" Yes / No

Next Screen if Yes:

"Beyond the climate protection contribution, the project also has positive effects on the local social, environmental and economic development. A brief overview of these additional benefits:

Social: Time-consuming wood collection is no longer necessary for local families, so that this time can be used for education and other activities. activities. In addition, less smoke inside houses reduces respiratory diseases, which benefits women and children in particular. women and children benefit the most.

Environmental: Local forests are conserved due to reduced logging, which protects the local ecosystem and natural habitats for wildlife. In addition, the project contributes to the reduction of soil erosion.

Economic: The production and maintenance of the efficient stoves creates jobs in the region and Malawian families have to spend less money on cooking fuel."

If answer 'No': no further information

Next Screen (All Treatments)

"In so far as this decision is selected and I thus receive 25 Euros, I would like to donate the following amount of it to the climate protection organisation: _____ Euro"

Experiment 2 – Treatment Questions

Treatment "Donation":

"In the following, we would like to ask you some questions on your social media consumption. Please answer the questions honestly and conscientiously.

1. How much time do you spend per day using social communication services (e.g. WhatsApp, Signal, etc.)?

    - More than 4 hours
    - 3-4 hours
    - 2-3 hours
    - 1-2 hours
    - 30 – 60 minutes
    - Less than 30 minutes

2. How much time do you spend per day using or consuming social media platforms (e.g., Instagram, Twitter, Facebook, TikTok, etc.)?

    - More than 4 hours
    - 3-4 hours
    - 2-3 hours
    - 1-2 hours
    - 30 – 60 minutes
    - Less than 30 minutes

3. How much time per day do you spend watching TV or using video streaming services (e.g. Netflix, Sky, Amazon Prime Video, Disney Plus, etc.)?

    - More than 4 hours
    - 3-4 hours
    - 2-3 hours
    - 1-2 hours
    - 30 – 60 minutes
    - Less than 30 minutes

4. How much time do you spend per day using music streaming services (e.g. Spotify, YouTube, etc.)?

    - More than 4 hours
    - 3-4 hours
    - 2-3 hours
    - 1-2 hours

- 30 – 60 minutes
- Less than 30 minutes

5. How much time do you spend per day consuming news (e.g. daily newspaper, watching the news, etc.)?

    - More than 4 hours
    - 3-4 hours
    - 2-3 hours
    - 1-2 hours
    - 30 – 60 minutes
    - Less than 30 minutes

Thank you very much for your answers in the domain of social media consumption."

Treatment "Carbon-Offsetting":

"The following sections is about your personal behaviour in the area of climate protection. For this purpose, we would like to ask you some questions aimed at your behaviour and habits in different areas of life in order to get an idea of the size of your personal carbon footprint in the respective areas. Your carbon footprint reflects all emissions of CO_2 that are directly or indirectly attributable to your personal behaviour. Please answer the questions honestly and conscientiously.

1. How often do you eat foods that contain meat or fish (e.g. spaghetti bolognese, rolls with salmon)?

    - Every day
    - 3-6 times a week
    - 1-2 times a week
    - 2-3 times a month
    - Once a month
    - Never

2. How often do you drink or eat milk and dairy products such as yogurt, cheese, butter or cream?

    - More than one portion a day
    - one portion a day
    - 1-6 portions a week
    - 1-3 portions a month
    - Not more than one portion a month
    - Never

3. How much do you spend monthly on leisure and culture (pets, fitness subscription, […], hobbies, etc.)?

    - More than 120 Euro per month
    - 80 – 120 Euro
    - 60 – 80 Euro
    - 40 – 60 Euro
    - 20 – 40 Euro
    - Less than 20 Euro per month

4. How many kilometers per year do you travel privately by car or motorcycle (as driver or passenger)?

    - More than 14,000 km
    - 6,000 – 14,000 km
    - 3,000 – 6,000 km
    - 1,000 – 3,000 km
    - 1 – 1,000 km
    - I never travel by car or motorcycle

5. On average, how many hours per year do you travel by air for private purposes?

    - More than 4 hours
    - 3-4 hours
    - 2-3 hours
    - 1-2 hours
    - 0-1 hours
    - I did not fly in the last couple of years

Thank you very much for your responses, which gives us a rough approximation of your carbon footprint!"

Next Screen

Both Treatments:

"In the following sections you will be asked to make a number of decisions. You will always be given instructions in advance in the form of a text explaining the decision. It is important that you read these instructions carefully.

Information for additional payment:

By participating in this study, you can earn money on top of your usual payment for participation. Whether you earn extra money and how much will be determined as follows: At the end of the study, every fifth participant will be randomly selected. The probability of being selected for an additional payment is therefore 20 %.

For those selected, one of the choices you made in this the part of the study will be randomly selected and implemented exactly as described. Since all choices have the same chance of being implemented and paid out, it is important that you think carefully about each of your choices before you make your selection. There are no right and wrong answers here - so please always answer entirely as you see fit."

Next Screen

Treatment "Donation":

"What is your decision in this section?

In this section you receive 12 Euros. In the following you can decide how much of this money you want to donate and how much you want to keep for yourself. To do this, you will be presented with a total of 7 different variants below, so that you will make 7 decisions. **If at the end of the study one of these decisions is chosen at random, then it will be implemented exactly as described here**. This means that the money you donate will actually be transferred to the organisations mentioned below. The money you do not donate will be credited to your personal account at the end of the study.

How does your decision relate to reducing CO_2 emissions?

One of the organisations you can donate to below uses the donations to buy certificates from CO_2 emissions trading. Each CO_2 certificate represents the right to emit one tonne of CO_2 into the air. The donations buy up CO_2 certificates from the European trading system (EU ETS), which are then no longer emitted and therefore can no longer pollute the climate. For every Euro you donate, 24 kg of CO_2 can be offset (for comparison: the daily per capita CO_2 emissions in Germany in 2019 were about 22 kg of CO_2, so with each Euro they can offset more than one day of an average German citizen)."

Treatment "Carbon-Offsetting": (Differences to Treatment "Donation" in *italics*)

"What is your decision in this section?

In this section you receive 12 Euros. In the following you can decide how much of this money you want to donate *in order to reduce your personal carbon footprint* and how much you want to keep for yourself. To do this, you will be presented with a total of 7 different variants below, so that you will make 7 decisions. **If at the end of the study one of these decisions is chosen at random, then it will be implemented exactly as described here**. This means that the money you donate *in order to reduce your personal carbon footprint* will actually be transferred to the organisations mentioned below. The money you do not donate will be credited to your personal account at the end of the study.

How does your decision relate to reducing CO_2 emissions?

One of the organisations you can donate to below uses the donations to buy certificates from CO_2 emissions trading. Each CO_2 certificate represents the right to emit one tonne of CO_2 into the air. The donations buy up CO_2 certificates from the European trading system (EU ETS), which are then no longer emitted and therefore can no longer pollute the climate. For every Euro you donate *in order to reduce your personal carbon footprint*, 24 kg of CO_2 can be offset (for comparison: the daily per capita CO_2 emissions in Germany in 2019 were about 22 kg of CO_2, so with each Euro they can offset more than one day of an average German citizen)."

Next Screen

Donation Decisions:

Each donation variant presented on a separate screen. Treatment order of this within-design variation was randomized for treatments 1-6. Treatment 7 always comes last.

Treatment	Description	
Introduction (all treatments)	Treatment "Donation": "[…] How much would you like to donate to buy carbon certificates?"	Treatment "Carbon-offsetting": "[…] How much would you like to donate to buy carbon certificates in order to reduce your personal carbon footprint?"
T1: No matching (Baseline)	"In this variant, we do not donate additional money to other projects."	
T2: CO_2 matching	"In this variant, for each Euro you donate, we add another 50 cents as an additional donation to buy carbon certificates."	

T3: Climate co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **a climate protection project** that reduces carbon emissions (by promoting renewable energies)."
T4: Environmental co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **an environmental protection project** (to preserve biodiversity and fertile soils)."
T5: Social co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **a social project** (help for street children and emergency shelter for the homeless)."
T6: Economic co-benefit	"In this variant, for each Euro you donate, we donate another 50 cents to **an economic project** (creation of vocational training places)."
T7: Random co-benefit	"In this variant, it is **randomly drawn** whether we donate another 50 cents for each Euro you donate. The probability that there is an additional donation is 50 %. Which of the projects you already know will receive the additional donation is also chosen at random (with equal probability for each project). Would you like to know if your donation triggers an additional payment and which project receives it?

Next Screen

"Thank you very much for your responses. Now, the next section starts."

Next Screen

"**What is your decision in this section?**

In this section you receive 12 Euros. You can decide below how much of these 12 Euros you would like to donate to different organizations that you already know from the last section.

If, at the end of the study, one of these decisions is chosen at random, it will be implemented exactly as described here. This means that the money you donate will actually be transferred to the organisations mentioned below. The money you do not donate will be credited to your personal account at the end of the study."

Next Screen

Donation Decisions:

The following four projects are presented in random order, each project on a separate screen:

"I donate the following amount to the project, which …

1. … aims to protect the climate by promoting renewable energies: _____ [0 - 12 Euro]"

2. … aims to protect the environment to preserve biodiversity and fertile soils: _____ [0 – 12 Euro]"

3. … works for social causes by helping street children and building emergency shelters for the homeless: _____ [0 - 12 Euro]"

4. … works to promote economic causes by creating vocational training places: _____ [0 - 12 Euro]"

Next Screen

This section is finished. Now the next section begins, in which we like to ask you, how similar you assess the objectives and impact of the projects described.

Next Screen

The following four projects are presented in random order, each project on a separate screen:

"How similar do you perceive the goals and impacts of the following projects? The project, which reduces carbon emissions by buying carbon certificates and the project, which …

1. … protects the climate by promoting renewable energies?

2. … protects the environment to preserve biodiversity and fertile soils?

3. … works for social causes by helping street children and building emergency shelters for the homeless?

4. … works to promote economic causes by creating vocational training places?

On a 7-point scale from 1 = Not similar at all, to 7 = Very similar."

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Thank you very much for your evaluation of the similarity of projects.