TUM School of Social Sciences and Technology
TUM School of Management

Munich Papers in Political Economy
Working Paper No. 04/2023

Greenwashing your personality

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June 2023

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June 15, 2023

Abstract

Behaving more sustainable has been shown to signal cooperativeness in social dilemmas. We investigate whether people exploit this apparent signaling value by inflating their intention to behave sustainably without changing their actual behavior. We explore this question in an online experiment in which participants self-report the importance of sustainability in their daily lives before engaging in a prisoner's dilemma game. Using a between-subjects design, we manipulate whether participants have the opportunity to adjust their self-reported sustainability scores after receiving instructions for the game. The results show that almost 30% of participants increase their sustainability scores in anticipation of higher transfers from their matched partners. However, this *greenwashing* strategy proves to be unsuccessful, as higher sustainability scores do not lead to higher transfers.

Keywords: Greenwashing, Social Dilemma, Signaling, Sustainability
JEL Codes: C91, H41, Q50

*This experiment was pre-registered at AsPredicted (#102279) and received IRB approval from the German Association for Experimental Economic Research e.V. (No. u9aefbgJ).

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1 Introduction

Enhancing cooperation in social dilemmas is a significant challenge within the social sciences and beyond. Previous theoretical research (e.g., Smith and Bird, 2000; Gintis et al., 2001; Lotem et al., 2003) and experimental studies (e.g., Grimm and Mengel, 2009; Brekke et al., 2011; Barclay and Barker, 2020) have demonstrated the effectiveness of reputation and signaling as mechanisms to promote cooperative behavior. In these studies, individuals are typically given the opportunity to signal their cooperativeness by engaging in costly altruistic acts, such as engaging in charitable giving, before interacting with others in a social dilemma. This signal of altruism enhances individuals' perceived cooperativeness and encourages others to reciprocate with increased cooperation. In other words, individuals benefit from their previous generosity in two ways: firstly, they are perceived as more cooperative and secondly, they also reap financial benefits as a result.

In recent years, research has demonstrated that sustainable behavior can also effectively signal positive personality traits and promote cooperation from others. In Mazar and Zhong (2010), participants rate a person purchasing green products as more cooperative, more altruistic, and more ethical than a person purchasing conventional products. Fehrler and Kosfeld (2013) conduct a study in which participants indicated their association with a pro-environmental NGO and subsequently participate in a trust game. Their results show that participants who identify themselves with a pro-environmental NGO are perceived as more trustworthy and elicit greater trust from others. Vesely et al. (2020) discover that more sustainable participants are preferred as cooperation partners and elicit higher cooperation from others in a public goods game. Consistent with the broader literature on signaling in social dilemmas, individuals who signal their concern for sustainability profit in two ways: on the one hand, sustainable individuals are perceived as more cooperative. On the other hand, they also receive financial benefits as a result. Consequently, sustainable behavior has signaling value, potentially leading to financial benefits in social interactions.

Barclay and Barker (2020) discuss the potential of raising the awareness of this signaling value to encourage sustainable behavior among individuals. In their experiment, participants demonstrate a stronger willingness to donate to an environmental charity when they are competing to be selected as cooperation partners by an observer for a subsequent cooperation game. By engaging in sustainable behavior, they effectively signal their cooperativeness. These findings suggest that promoting the positive signaling value of sustainable behavior can be an effective strategy to motivate individuals to adopt more sustainable behaviors.

However, it is important to acknowledge a significant concern associated with this proposition – the potential risk of people exaggerating their willingness to engage in sustainable

behavior (what we refer to as *greenwashing*). This phenomenon becomes particularly relevant when the act of exaggerating sustainable behavior incurs minimal costs or consequences. Barclay and Barker (2020) mitigate this concern by design because participants' can only provide a costly signal, as they have to spend money to demonstrate their commitment to sustainable behavior. This approach reduces the likelihood of greenwashing. However, if the signaling process becomes cost-free, such as relying solely on stated intentions, it could become problematic. In such instances, individuals may strategically engage in greenwashing as a means to signal positive personality traits and gain financial benefits in social interactions.

The concept of greenwashing behavior has only been studied at the organizational level (e.g., Greer and Bruno, 1996; Mitchell and Ramey, 2011; Yang et al., 2020) but not at the individual level. To close this gap, we conduct an experiment that exogenously manipulates the opportunity for participants to signal sustainable values before entering a social interaction. In the experiment, participants answer demographic questions and self-assess their sustainability scores in a questionnaire. In a between-subjects design, we randomly assign participants to either a *Control Treatment* or *Signaling Treatment* before they play a Continuous Prisoner's Dilemma Game (Goerg and Walkowitz, 2010). In *Signaling*, participants have the opportunity to revise their sustainability scores after reading the game's instructions whereas there is no revision opportunity in the *Control*. This design allows us to test whether (1) more sustainable people are perceived as more cooperative, (2) people try to exploit this perception and pretend to be more sustainable to elicit higher cooperation from matched partners, and (3) whether overall this strategy turns out to be successful.

Our study amplifies the literature on the signaling value of sustainability. In contrast to studying the signaling value itself, we focus on the incentives to exploit it. We document that participants who can manipulate their self-reported sustainability scores believe in a positive relationship between own sustainability scores and the partner's transfer in the prisoner's dilemma game. This belief is in line with findings from the existing literature.[1] Moreover, participants try to exploit this attribution by raising their sustainability scores. Specifically, we show that almost 30% of the participants in *Signaling* adjust their sustainable scores to higher levels. Thus, we provide strong evidence that participants *greenwash* their personality to elicit higher transfers from their matched partners. However, in contrast to participants' beliefs, the attempt to greenwash proves to be ineffective in our setting, as higher signaled sustainability scores do not result in increased levels of cooperation. This finding starkly contradicts prior research, which demonstrated that both stated (Vesely et al., 2020) and revealed sustainable behavior (Barclay and Barker, 2020) elicits higher cooperation from

[1] However, in contrast to the literature, we do not find such a correlation between beliefs and sustainability scores for participants who cannot communicate an adjusted sustainability score.

others.

More broadly, our results provide a potential explanation for the intention-behavior gap that is commonly observed in the context of sustainable behavior (Joshi and Rahman, 2015; Groening et al., 2018; ElHaffar et al., 2020). Despite the growing concern surrounding climate change (see e.g. Cantner and Rolvering, 2022; Leiserowitz et al., 2022) research indicates a significant mismatch between individuals' stated willingness to adopt sustainable behaviors and their actual behaviors (Joshi and Rahman, 2015; Groening et al., 2018; ElHaffar et al., 2020). Previous research has primarily focused on identifying barriers that impede behavioral change despite stated intentions. However, our proposition offers an additional perspective: individuals may overstate their intentions to present themselves as virtuous individuals and gain personal advantages in social interactions. Therefore, it is vital to closely examine not only the barriers to implementing sustainable intentions but also the purportedly sustainable intentions themselves.

The remainder of this paper proceeds as follows: Section 2 describes the experimental design. Section 3 shows the results. Section 4 concludes with a discussion.

2 Experimental design

We use an online experiment to explore the signaling value of sustainable attitudes and investigate whether this signaling value - if existent - is exploited for own advantage.[2] In the pre-experimental questionnaire, participants answered demographic questions and self-assessed their sustainability scores. The main experiment consisted of four parts and we randomly chose one part for payments. Before the main experiment started, participants were assigned to the *Control Treatment* or the *Signaling Treatment*. In Part A, participants played a continuous prisoner's dilemma (Goerg and Walkowitz, 2010) with a randomly matched partner from the respective other treatment. Therefore, a matched pair always consisted of one participant from the *Control Treatment* and one participant from the *Signaling Treatment*. The treatment manipulated whether participants could adjust their self-assessed sustainability scores before entering the prisoner's dilemma game. In Part B and Part C, we used incentivized questions to elicit first and second order beliefs about transfers. In Part D, we elicited incentivized beliefs about sustainability scores of others and the share of participants adjusting their sustainability scores. The experiment concludes with a post-experimental questionnaire. Below, we provide a detailed outline of the different parts of the

[2]The study was pre-registered on AsPredicted. The analyses for results 2 and 5 in Section 3 directly test the pre-registered hypotheses.

experiment.[3]

Pre-experimental questionnaire. We elicited participants' age, gender, highest level of education, political views, and total household income. In addition, we asked participants to assess the importance they ascribe to sustainable behavior in their daily lives using a slider from 0 (not important at all) to 100 (very important). We informed all participants that their score would be visible to another participant in the course of the experiment.

Part A: continuous prisoner's dilemma. To elicit cooperation behavior, participants played a two-player continuous prisoner's dilemma introduced by Goerg and Walkowitz (2010). In this dilemma participants chose a degree of cooperation with their matched partner. Both players received an initial endowment of £2. Subsequently, they simultaneously made their transfer decision, namely how much of their £2 they wanted to transfer to their matched partner (in £0.10 increments). The transferred amount was doubled and credited to the matched partner's account.
Before making the transfer decisions, participants answered several control questions to ensure that all participants understood the instructions. The experiment continued when both players answered the control questions correctly. We informed participants that their own and their partner's sustainability scores would be revealed right before they make their transfer decisions. At this point, we implemented the treatment variation: In the *Signaling Treatment*, we offered participants the possibility to revise the sustainability score they specified in the pre-experimental questionnaire. They were informed that their matched partner in the *Control Treatment* had no revision opportunity and was not aware of their own revision opportunity. Subsequently, all participants learned the sustainability score of their matched partner and made their transfer decisions.

Part B and Part C: incentivized belief elicitation. In Part B, we asked participants to enter their best guess about the transfer of their matched partner (first order beliefs). In Part C, we asked participants to enter their best guess about the belief of their matched partner about their own transfer (second order belief). To incentivize truthful reporting, participants received a bonus of £5 if their answers matched the actual transfer or the first-order belief of their matched partner.

Part D: anticipated sustainability scores and greenwashing. In the *Control Treatment*, we elicited participants' best guess about the most selected sustainability score in

[3]Appendix B includes screenshots from the experimental instructions.

the pre-experimental questionnaire of a reference group with 10 other participants. They received a bonus payment of £5 if they guessed the most selected score correctly. In the *Signaling Treatment*, we elicited participants' best guess about how many out of a reference group with 10 other participants adjusted their sustainability scores to higher levels. The data for the respective reference groups was taken from a pilot experiment.

Post-experimental questionnaire. We used additional non-incentivized questions to receive more background information about participants and their choices made during the experiment. First, we used the strategy method (Selten, 1965) to elicit participants' hypothetical transfers conditional on different hypothetical sustainability scores (0, 25, 50, 75, 100) of their matched partners (*"What would you transfer if your matched partner has the sustainability score x?"*). Second, we used the strategy method to elicit participants' beliefs about their matched partners' hypothetical transfers conditional on different hypothetical sustainability scores (0, 25, 50, 75, 100) of themselves (*"What do you think your partner would transfer if you have the sustainability score x?"*). Third, we asked participants in the *Signaling Treatment* why they did or did not adjust their sustainability scores. Fourth, participants answered questions from the Global Preference Survey (henceforth GPS) (Falk et al., 2018, 2022). Specifically, we used the GPS to measure risk and time preferences, positive and negative reciprocity, altruism, and trust. Finally, participants answered the short version of the Sustainability Conscientiousness Questionnaire (henceforth SCQ) (Gericke et al., 2019). The SCQ measures sustainability knowingness, sustainability attitudes and sustainability behavior as well as sustainability consciousness. We only used the subscale that measures sustainability behavior.

Procedures. The online experiment was programmed with the experimental software otree (Chen et al., 2016). We conducted the experiment on the platform Prolific with a convenience sample from the UK. We credited the £1 completion fee and optional bonus payments to participants' Prolific accounts. We recruited a total of 200 participants and 186 participants finished the experiment. Therefore, we ended up with 93 participants each in both treatments. The median duration of the experiment was 8.3 minutes.

3 Results

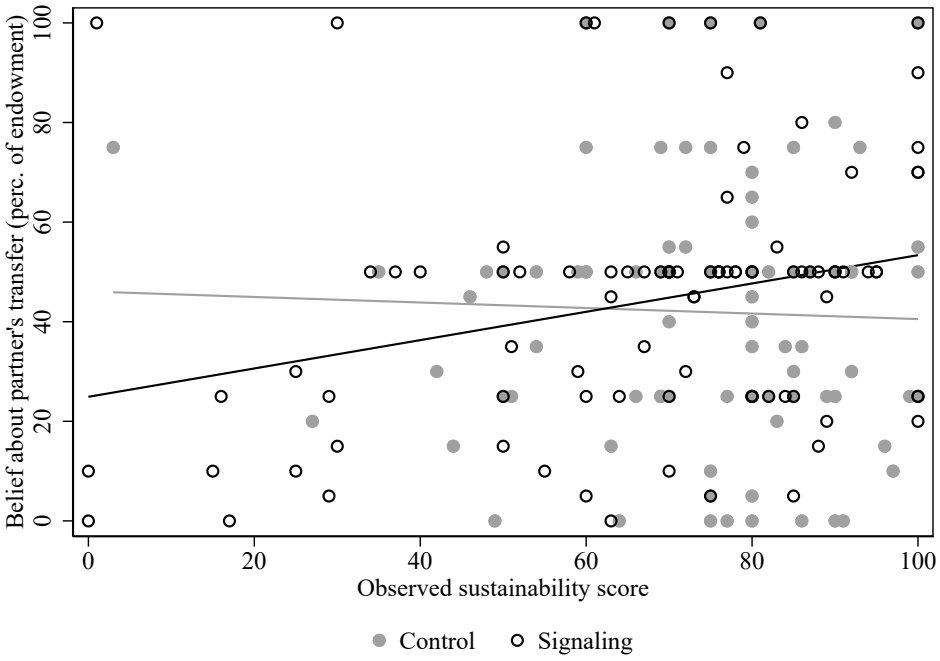
The main outcome variables from our experiment are participants' transfers as a percentage of the initial endowment and their self-reported sustainability scores ranging from 0 to 100 in one-point increments.

The pooled initial sustainability scores over both treatments are on average 68.8 and strongly correlated with SCQ scores (Spearman's $\rho = 0.478$ with $p < 0.001$). This result suggests that self-reported sustainability scores are consistent with a scientifically validated sustainability score (Gericke et al., 2019). Neither initial self-reported sustainability scores (67.6 vs. 70.0, $p = 0.471$, two-sided t-test) nor SCQ-scores (34.8 vs. 34.9, $p = 0.859$, two-sided t-test) differ significantly between the *Control Treatment* and the *Signaling Treatment*.

In the following we first test whether more sustainable people are perceived as more cooperative, we then test whether participants engage in greenwashing behavior by adjusting their communicated sustainability scores to higher levels, and finally we investigate the impact of greenwashing behavior on the transfers from matched partners.

Signaling of cooperativeness

Figure 1: Beliefs about partner's transfer on observed sustainability score



Lines represent linear estimates for beliefs about partners' transfers on observed sustainability scores.

Figure 1 shows the beliefs about the partner's transfer as a percentage of the initial endowment conditional on the observed sustainability scores of the matched partner. The figure visually reveals a positive relationship between beliefs about the partner's transfer and sustainability scores in the *Signaling Treatment* when participants are aware of the greenwashing opportunity (Spearman's $\rho = 0.275$ with $p = 0.008$). To this end, participants

are perceived as more cooperative when they indicate higher sustainability scores. Interestingly, this positive relationship between beliefs about the partner's transfer and sustainability scores does not exist in the *Control Treatment* (Spearman's $\rho = -0.035$ with $p = 0.742$). This discrepancy in results between treatments indicates that instead of the signaling opportunity disclosing the cheap talk character of self-reported sustainability scores it generates a belief in its effectiveness.

Result 1 *More sustainable participants are not perceived as more cooperative per se. In the Control Treatment we observe no positive relationship between beliefs about matched partners' transfers and their sustainability scores. However, once the opportunity for greenwashing arises in the Signaling Treatment, participants believe in a positive relationship.*

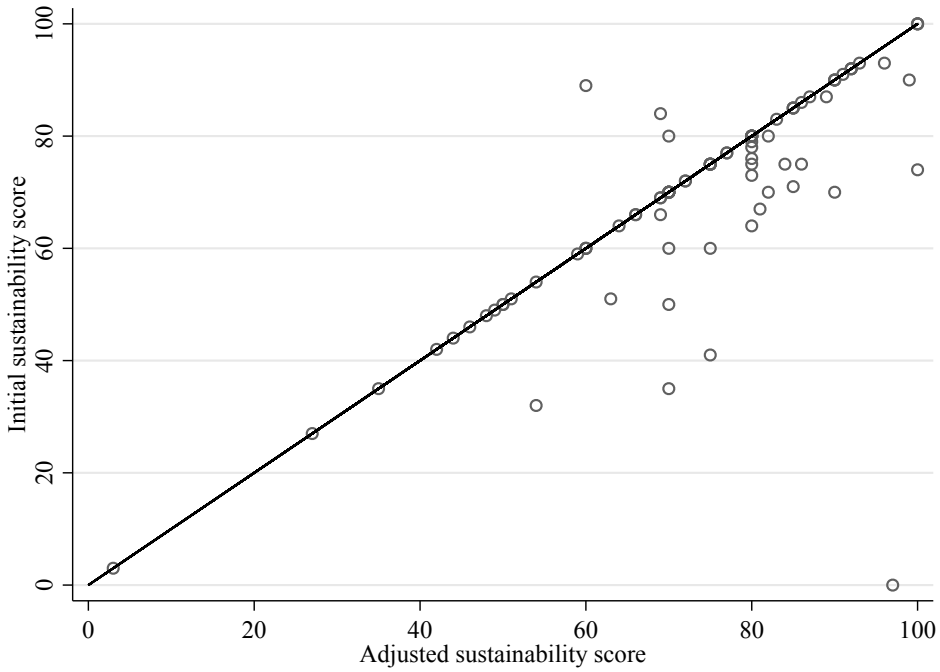
Adjustments of sustainability scores

The beliefs in the *Signaling Treatment* suggest that subjects expect a positive return of greenwashing on transfers. In the following we investigate whether participants greenwash their personality by adjusting their scores to higher levels if given the opportunity.

Figure 2 shows initial and final sustainability scores in the *Signaling Treatment*. Points on the line indicate no adjustment, points above the line indicate reductions of scores, and points below the line indicate increases in the scores. Overall, 28.0% of participants adjusted their sustainability scores upwards, 68.8% remained at their initial scores, and 3.2% adjusted their scores downwards. Thus, while the average initial sustainability score is 70.0, the average final sustainability score is significantly higher at 73.7 ($p = 0.006$, two-sided t-test). This average adjustment is mostly driven by the adjustments of participants with an initial score equal or below the median initial score of 74. For them initial and adjusted scores differ significantly (56.6 vs. 64.2, $p = 0.003$, two-sided t-test) while no such significant difference is observed for participants with above median scores (83.6 vs 83.5, $p = 0.879$, two-sided t-test). Interestingly, the percentages of participants adjusting with above and below median initial scores do not differ significantly (28% vs 34%, $p = 0.656$, two-sided Fisher's exact test) suggesting that the differences between the two groups are driven by the magnitude of adjustments: the lower the initial score the higher the adjustment. A Spearman's correlation between adjustments and initial sustainability scores in *Signaling Treatment* confirms this insight ($\rho = -0.266$ with $p < 0.010$). Figure 3 visually represents the distribution of upward adjustments with an average upward adjustment of 15.6.

Result 2 *In the Signaling Treatment, participants engage in greenwashing behavior by adjusting their sustainability scores to higher levels.*

Figure 2: Initial and adjusted sustainability scores



Points on the line indicate no adjustments, points below the line indicate upwards adjustments

We now explore the underlying reasons for participants' sustainability score adjustments. First, we investigate participants' beliefs about their matched partners' hypothetical transfers if they would have reported sustainability scores of 0, 25, 50, 75, and 100. Figure 4 plots these conditional beliefs, showing that participants expect a positive relationship between own sustainability scores and transfers from matched partners. Based on a simple regression, participants expect for an increase of the sustainability score by 25 points an increase of the partner's transfer by an amount equivalent to 10% of the initial endowment.[4]

We also find evidence for the strategic nature of the adjustments in the qualitative data from the post-experimental questionnaire.[5] The responses of participants who adjusted their sustainability scores to a higher level reveal the anticipation of receiving higher transfers from their matched partners. This is perfectly summarized by a participant who argued that "*[...] if my sustainability score is higher, then the other participant is more likely to transfer me more money*". Conversely, participants who did not adjust their sustainability scores indicated that their decisions were influenced by their preferences for honesty and consistency, which prevented them from increasing their sustainability scores. For example,

[4]OLS explaining expected transfers with sustainability scores ($b = 0.40$, $t = 11.98$, $p < 0.001$) with robust standard errors and clustering at the individual level.

[5]Appendices A.1 and A.2 list participants' actual responses.

Figure 3: Distribution of upward adjustments

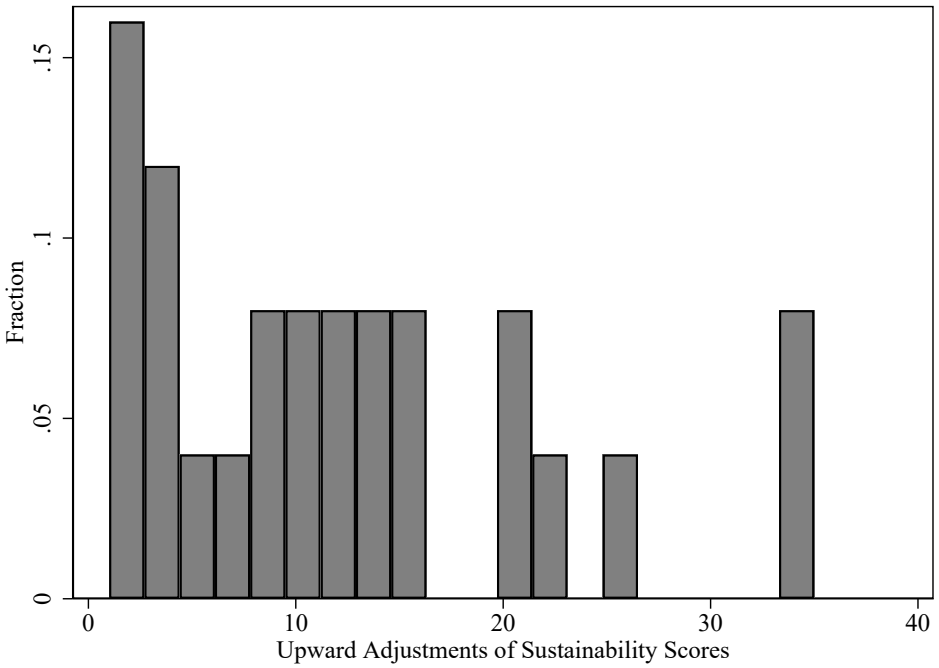
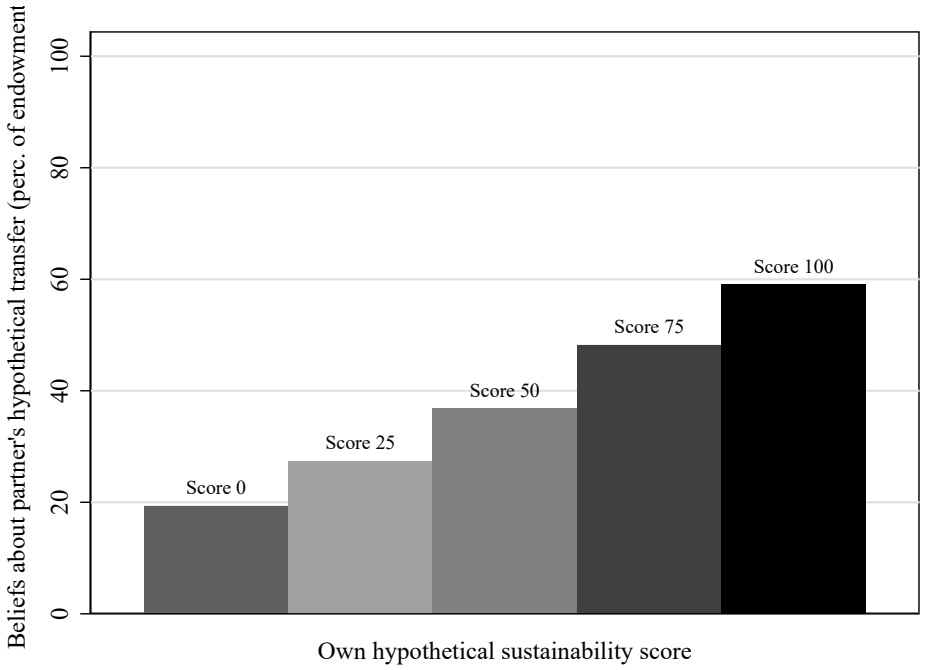


Figure 3 excludes one extreme outlier who adjusted the sustainability score by 97 points upwards.

Figure 4: Beliefs about partner's hypothetical transfer on hypothetical sustainability score



one participant stated that it "*[...] answered honestly the first time and didn't see a reason to change it just to look better to someone else*". Taken together, the quantitative and qualitative data indicates that those participants that engaged in *greenwashing* behavior do so because they anticipated higher transfers from their matched partners.

Result 3 *Participants engage in greenwashing behavior because they anticipate higher transfers from their matched partners.*

In Part D of the experiment, we elicited participants' beliefs about the share of upward adjustments among a reference group of 10 other participants. Interestingly, participants expected a higher share of greenwashing than the actual share of participants who adjusted their sustainability scores to a higher level. On average, participants expect that 61.5% adjust their sustainability scores upwards while in fact only 28.0% of participants adjusted their sustainability scores to a higher level. As expected, the anticipated share of greenwashing is higher among participants who adjusted their sustainability upwards (74.5%) compared to participants who did not adjust their sustainability scores upwards (56.4%).

Result 4 *The anticipated share of greenwashing behavior is higher than the actual greenwashing behavior.*

Signaling value of sustainability scores

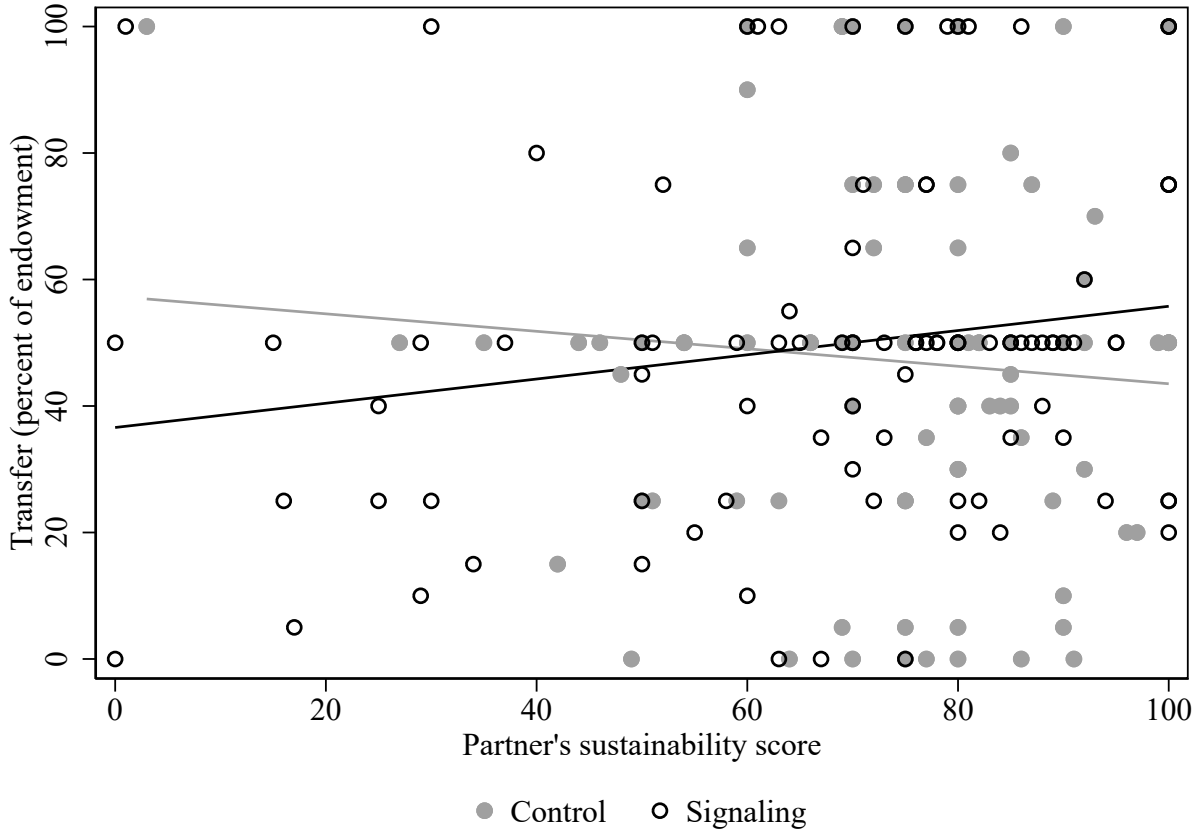
The greenwashing behavior of participants in the *Signaling Treatment* raises the question whether it indeed elicits higher transfers from matched partners. Figure 5 visually represents that there is generally no positive relationship between transfers and sustainability scores of matched partners in the *Control Treatment* (Spearman's $\rho = -0.064$ with $p = 0.543$) and only a weakly significant positive relationship in the *Signaling Treatment* (Spearman's $\rho = 0.191$ with $p = 0.066$).[6]

In Table 1, we directly quantify the effect of greenwashing on transfers. In column 1, we regress transfers from participants in the *Control Treatment* on a dummy for upward adjustments of the matched partner (greenwashing) in the *Signaling Treatment*, controlling for initial sustainability scores. The estimated coefficient for the greenwashing dummy shows no positive effect of greenwashing on transfers. If anything, greenwashing tends to have a negative impact on transfers ($p = 0.085$).

In column 2, we include additional control variables to investigate alternative drivers of participants' transfers. The estimated coefficients show that participants' own sustainability

[6] In an OLS regression with robust standard errors, the coefficient for the partner's score in the *Signaling Treatment* turns out to be insignificant already without any additional controls.

Figure 5: Transfer on partner's sustainability score



scores are also uncorrelated with transfers. This result implies that more sustainable participants – measured by self-reported sustainability scores – are in fact not more generous. In line with previous literature, the survey measures of altruism and positive reciprocity are positively correlated with transfers. Furthermore, beliefs about the matched partners' transfers (first order beliefs) and beliefs about the matched partners' beliefs about own transfers (second order beliefs) are strongly correlated with transfers.

Taken together, we find no evidence that sustainability scores hold any positive signaling value in our context. Furthermore, it is evident that greenwashing behaviors are ineffective. By combining these findings with participants' conditional beliefs, as depicted in Figure 4, we observe that participants have incorrect expectations regarding the positive signaling effect of self-reported sustainability scores on transfers.

Result 5 *Greenwashing does not elicit higher levels of cooperation because transfers are not consistently correlated with matched partners' sustainability scores.*

Table 1: Effect of greenwashing on transfer

Dependent variable:	Transfer (percent of endowment)	
	(1)	(2)
Greenwashing	-9.62*	-1.95
(1 if matched partner adjusted upwards, 0 otherwise)	(5.52)	(3.63)
Initial Sustainability Score of Matched Partner	0.01	-0.00
	(0.16)	(0.08)
Own Sustainability Score		0.03
		(0.08)
Risk		-0.16
		(0.62)
Trust		-0.19
		(0.79)
Altruism		2.78***
		(0.92)
Positive Reciprocity		0.43**
		(0.19)
Negative Reciprocity		0.12
		(0.87)
First Order Belief		32.85***
		(4.86)
Second Order Belief		13.70***
		(4.52)
Constant	49.40***	-21.28**
	(11.98)	(10.62)
Observations (subjects)	93	93
R^2	0.02	0.74

Analysis uses OLS regressions with robust standard errors in parentheses. Stars reflect significance in a t-test of the null hypotheses that coefficients are equal to 0, $*p < 0.10$, $**p < 0.05$, $***p < 0.01$.

4 Discussion

In this paper we explore the signaling value of sustainable attitudes and whether this value is exploited for own advantage. Our study shows that participants who can adjust their signaled sustainable attitudes believe in a positive relationship between sustainable attitudes and perceived cooperativeness. They also assume that matched participants would transfer higher amounts to participants with higher sustainability scores and, therefore, they engage in the *greenwashing of their personality* to elicit higher levels of cooperation in a social dilemma situation. However, in contrast to participants' expectations, the greenwashing in

our setting proves to be unsuccessful, as higher sustainability scores do not lead to higher cooperation levels.

Our results stand in contrast to previous studies, showing that sustainable behavior elicits more cooperation from others (e.g., Vesely et al., 2020). One potential reason for the absent signaling value in our setting may be that participants only observe the isolated sustainability score of their matched partner and do not have a reference point except their own score. An alternative explanation may be that self-reported sustainability scores are, in contrast to costly signals, perceived as cheap talk. For instance, Barclay and Barker (2020) find a positive signaling value of donating to an environmental charity for cooperation, which provides a costly and perhaps more credible signal. However, participants in our experiment believe that even cheap-talk signals, i.e., greenwashing, would be beneficial for them and almost 30% of the participants actually engage in greenwashing. While this strategy does not turn out to be successful in our cheap-talk setting, it is unclear whether people can easily distinguish between cheap talk and costly signals in more complex settings outside the lab. Future research is needed to understand whether greenwashing remains unsuccessful in more complex environments.

Previous literature suggests that sustainable behavior can be promoted by highlighting the positive signaling value in social interactions (Barclay and Barker, 2020). Our results indicate that this solution becomes problematic if sustainable behavior is not perfectly observable as it provides the opportunity for people to pretend sustainable intentions while in fact they do not behave accordingly. To this end, promoting sustainability by highlighting the positive signaling value may exaggerate the gap between individuals' intentions and their actual sustainable behavior. This intention-behavior gap undermines the credibility and trustworthiness of individuals that express intentions to be environmentally responsible, potentially eroding public trust. This can have broader implications for sustainability initiatives and hinder collective efforts towards creating a more sustainable future.

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Appendices

A Supplementary analyses

A.1 Reasons for adjustment of sustainability score

1. I felt that it was more important to be sustainable and by being sustainable and being perceived as such other people would be more sustainable.
2. The reason was because my income covers all bills and I always have some left over for a luxury item so its quite sustainable. At the start I was thinking I don't own my own house or car etc, but at the end was thinking but I do live in a nice place and have a car I will own by the end of the year, therefore because my thinking switched so did my answer.
3. I consider myself as a person that cares about sustainability.
4. to show i was more sustainable.
5. To make the other person think I was more sustainable and a good person.
6. I wanted to be liked and trusted more to get a better donation from B.
7. 76 was too low.
8. I put it up because I figured it would be better to have a higher score as it means I am better with my money and understand how it works.
9. To show that Iâm not selfish so wouldn't transfer little money.
10. to be a more accurate reflection of myself.
11. to appear like a better person.
12. in order to look more appealing and reflect well on me.
13. To try a d get more.
14. To put me in the middle. I don't know really, people may think I'm more deserving of I am more sustainable.
15. I think if my sustainability score is higher, then the other participant is more likely to transfer me more money.
16. I wanted to round 78 to 80 so it seemed like I had a higher sustainability score.
17. I felt a sense that I should donate the most amount to the other person and it was a sustainable instinct to help others.
18. I wanted to appear as positive towards sustainability as possible whilst remaining realistic when appearing to the other person.
19. to show that i was willing to send across the whole £2 as it would be beneficial for both of us to do this.
20. to make a better impression.

21. I think people are more trustworthy if they are conscious of sustainability, therefore it is likely to increase the amount they shared.
22. I felt I was a bit low.
23. thought about it more since i had more time to think about it.
24. I preferred the round number.
25. I didn't fully understand what the word meant so looked it up and then revised my decision.
26. I assume people are into sustainability nowadays and I wanted the other person to look at me favourably and to transfer the higher amount of endowment.

A.2 Reasons for not adjusting sustainability score

1. Happy to stay the same.
2. My sustainability score wasn't impacted by someone else. It is mine and knowing other information doesn't change that objective measure.
3. My score was not affected by added information.
4. I thought if I made it artificially high then there would be less chance of being transferred more money as it would seem deceitful.
5. Thought I would be honest with myself and answer the question as I would want to.
6. Because I did not care what anyone else thought about that score.
7. I don't see how would have affected the amount I would receive positively.
8. It reflects how I feel.
9. It's honest.
10. I was being honest, that's just how I felt my own rating was.
11. Because it shouldn't changed based on what someone may think of me.
12. I answered honestly the first time and didn't see a reason to change it just to look better to someone else.
13. Because the score was an honest reflection of my position.
14. how they perceive my score doesn't bother me at all.
15. Believe in making first choice.
16. I was honest initially and did not want to revise for this reason. It felt manipulative to change my answer once I knew what was at stake.
17. It is the right amount already.
18. i didn't feel the need too.
19. Because I believe that is right.

20. That is my score and I believe in myself there was no reason for it to change.
21. The sustainability of myself or another person did not have any influence in my decision making.
22. I am content with the score that I initially input, there was no reason to change.
23. Even though I try, and it is very important to me, I struggle to live a fully sustainable lifestyle.
24. I'm pretty happy with this score as it stands, don't think it's necessary to lie.
25. I was honest the first time I answered the question. I didn't feel the need to change it.
26. Because money doesn't affect my score, it was based on my actions as a person. I think I have integrity.
27. None.
28. I don't see the purpose of changing it - how would that affect how much another person was giving me in what is essentially an economics game?
29. I think it's a fair approximation of how much I care about sustainability - plus I'd find a score of 100 to be slightly dishonest as we all live in and participate in a system which generally goes against this cause!
30. Because I was sure of my decision as it represents my values, and as much as possible, I want to uphold them and not change them for others, even if money is involved.
31. I think honesty is worthy of a reward.
32. Because it is true.
33. Because i had no reason to change it. That was my opinion.
34. I felt that my score should remain pretty much the same, I was still just thinking about my general attitude towards sustainability.
35. I am an honest person and didn't think changing my score to try and sway Person B's decision would be moral.
36. i wanted to answer honestly.
37. Because it would be untruthful.
38. That was my score originally and I would never change it regardless of the bonus.
39. I've made my decision and saw no point to change it.
40. as i thought it was fair enough the first time.
41. Because this is how important it was to me.
42. I believe it is honest in my reflection on myself and my buying habits and lifestyle decisions. there are some improvements I could make but for me, I would say it is a comfortable score.
43. That is how I feel.
44. I did not feel the need to as I wanted it to be accurate of how I feel 45. I was happy

with it and didn't feel it needed changing.
46. It would be lying.
47. I didn't lie when I initially gave myself that score. It's something I've looked into extensively and I actively try to reduce my carbon footprint so I know generally how much of an impact I make on our environment. I expect a lot of applicants would've lied about their true score, however, with the current economy I can't exactly blame them even if it is just a matter of a few pounds.
48. Because I was honest in my original answer and felt changing it would be dishonest.
49. I agree with my choice.
50. I think that's accurate but I didn't want to change it to look better.
51. I was sticking with my original input.
52. I was happy with it, it was a true reflection of my beliefs.
53. initial score was a true score and i stuck by it.
54. Because it was already high and it was truthful.
55. I didn't want Person B to expect my generosity and then be disappointed.
56. because i maintain my opinion.
57. No idea.
58. It doesn't affect how much I wish to give.
59. Wanted to be honest. My commitment to sustainability is important part of my identity and I didn't want to be disingenuous.
60. I feel I made the correct decision initially.
61. Just because I later learned that my reward might increase, I still consider my sustainability score to be 86. Financial incentive here does not affect my sustainability score.
62. I didn't think it necessary.
63. It was my objective answer in the first place and I don't care about trying to influence the partner.
64. I would be lying if I were to increase my score, and that doesn't seem morally right.
65. I feel I answered honestly when I was first asked this question.
66. I saw that it said, "in your everyday life". Even though sustainability is important to me, I feel like I don't implement as much as I could in my day-to-day life.
67. My decision didn't change.
68. I was happy with my original score that i decided on.

B Experimental instructions

General Instructions

Welcome to this study!

Please read the following instructions carefully. A clear understanding of the instructions will help you to make better decisions and increase your earnings from this study.

For participating in today's study, you will receive a participation fee of **£1.00**. You may earn additional money depending on your decisions. The experiment will approximately take 10 minutes. Please note that you will only receive the payment for this study if you finish the whole study.

You may have heard about studies in which participants are deceived. This is an economics study. Economics studies do not involve deception by the researchers. That is, all instructions that you will receive are true and accurate.

There are four parts to today's experiment: Part A, Part B, Part C and Part D. You will receive detailed instructions for each part before you participate in them. Note that your decisions in one part will not affect your earnings from the other parts.

You will be paid for the decisions you make in **one** of the four parts. At the end of today's experiment, the computer will randomly determine which part to pay you for. This implies that you should carefully consider **all of the decisions** you make in each part as they may determine your earnings.

Before you start with Part A of the experiment, we kindly ask you to fill in a short questionnaire.

Please fill in the short questionnaire

What is your age?

What is your gender?

- Male
- Female
- Other/Non Binary
- Prefer not to answer

What is the highest level of education you have completed?

- Some Primary
- Completed Primary School
- Some Secondary
- Completed Secondary School
- Vocational or Similar
- Some University but no degree
- University Bachelors Degree
- Graduate or professional degree (MA, MS, MBA, PhD, JD, MD, DDS)

What is your total household income before taxes during the past 12 months?

- Less than 20,000 pounds
- 20,000-39,999 pounds
- 40,000-59,999 pounds
- 60,000-99,999 pounds
- More than 100,000 pounds

Below is a slider on which the political views that people might hold are arranged from extremely liberal (left) to extremely conservative (right). Where would you place yourself on this scale?

Extremely liberal — Extremely conservative

Finally, you can adjust the slider below to indicate **how important you consider sustainable behavior in your everyday life**. Sustainable behavior means taking into account the need to preserve the planet for present and future generations, while taking into account economic, environmental and social development.

On a scale from 0 to 100, how important do you consider sustainable behavior in your everyday life?

Not at all important — Very important

Your sustainability score is:

Instructions for Part A

In Part A of the study, you are randomly matched with another participant. You are Person A, and the randomly assigned other participant is Person B. **You and Person B simultaneously face the same decision**.

You and Person B first receive an initial endowment of **£2.00**. You will then have the opportunity to transfer any part of your endowment to Person B. You can only transfer an amount in the interval [£0.00, £0.10, £0.20, ... , £1.80, £1.90, £2.00].

The amount you transfer to Person B is doubled. That means that Person B receives twice the amount you have transferred to him/her. The randomly assigned participant acting as Person B is given exactly the same alternatives as you have. That means that Person B also has the possibility to transfer any amount of his/her endowment to you. The amount Person B transfers to you is also doubled. That means that you receive twice the amount Person B has transferred to you.

You will make your decisions simultaneously and your decisions are completely anonymous. That is, you and Person B will never learn each other's identity.

The following formula shows how the amount you transfer to Person B and the amount Person B transfers to you affects your personal income.

	Your income		**Person B's income**
	Initial endowment (£2.00)		Initial endowment of Person B (£2.00)
-	amount you choose to transfer to Person B	-	amount Person B choose to transfer to you
+	2 x the amount Person B transferred to you	+	2 x the amount you transferred to Person B
=	Your income	=	Person B's income

Practice questions for Part A

Remember, the following formula shows how the amount you transfer to Person B and the amount Person B transfers to you affects your personal income:

	Your income		**Person B's income**
	Initial endowment (£2.00)		Initial endowment of Person B (£2.00)
-	amount you choose to transfer to Person B	-	amount Person B choose to transfer to you
+	2 x the amount Person B transferred to you	+	2 x the amount you transferred to Person B
=	Your income	=	Person B's income

Imagine you transfer £0.00 (out of £2.00) to Person B and Person B transfers £1.30 (out of £2.00) to you:

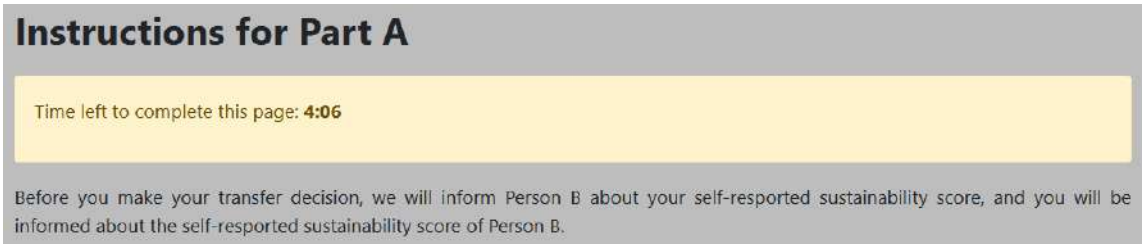
What is your income?

- £13.80
- £4.60
- £9.20
- £2.30

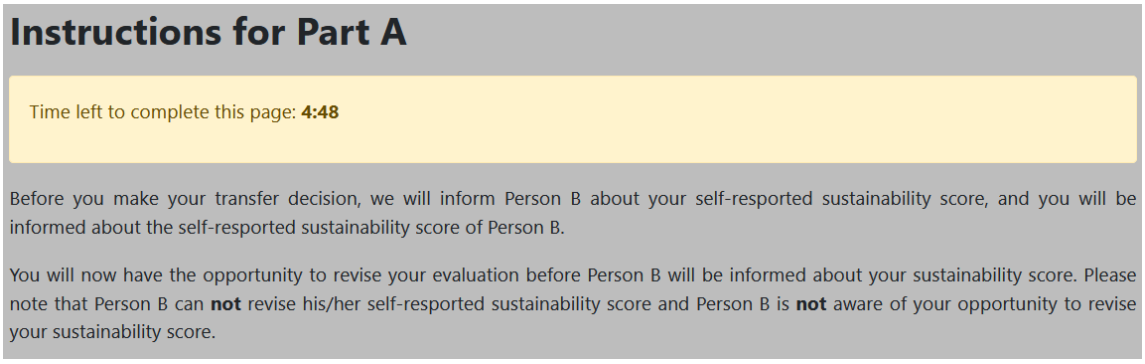
What is Person B's income?

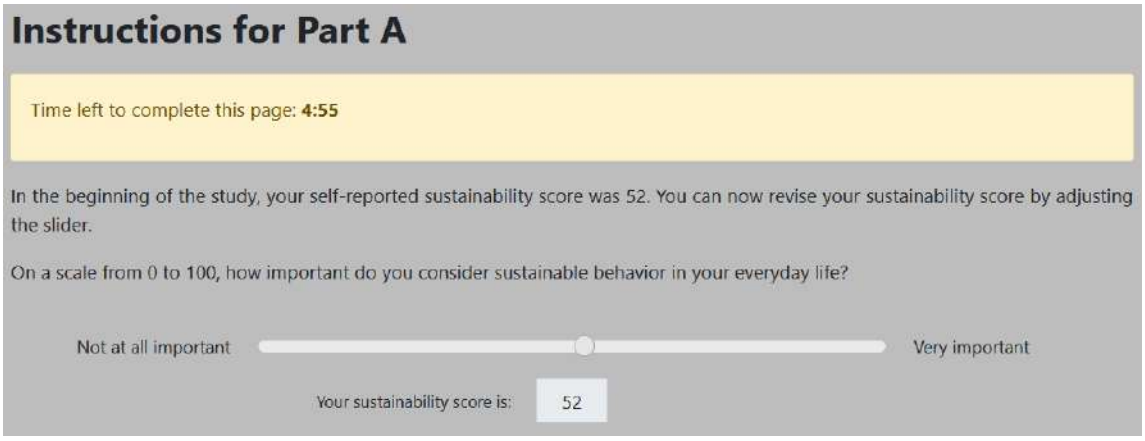
- £1.40
- £2.10
- £0.35
- £0.70

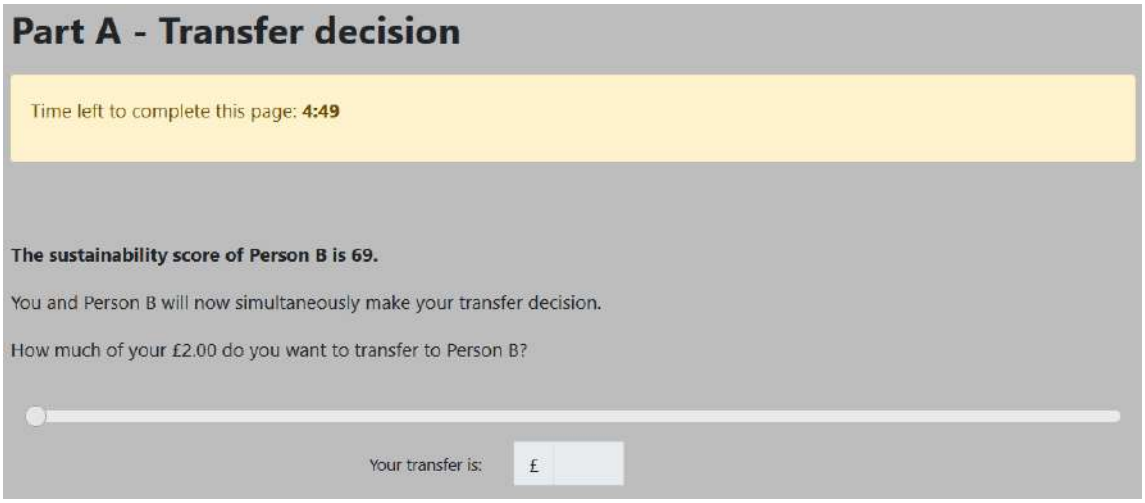
Control

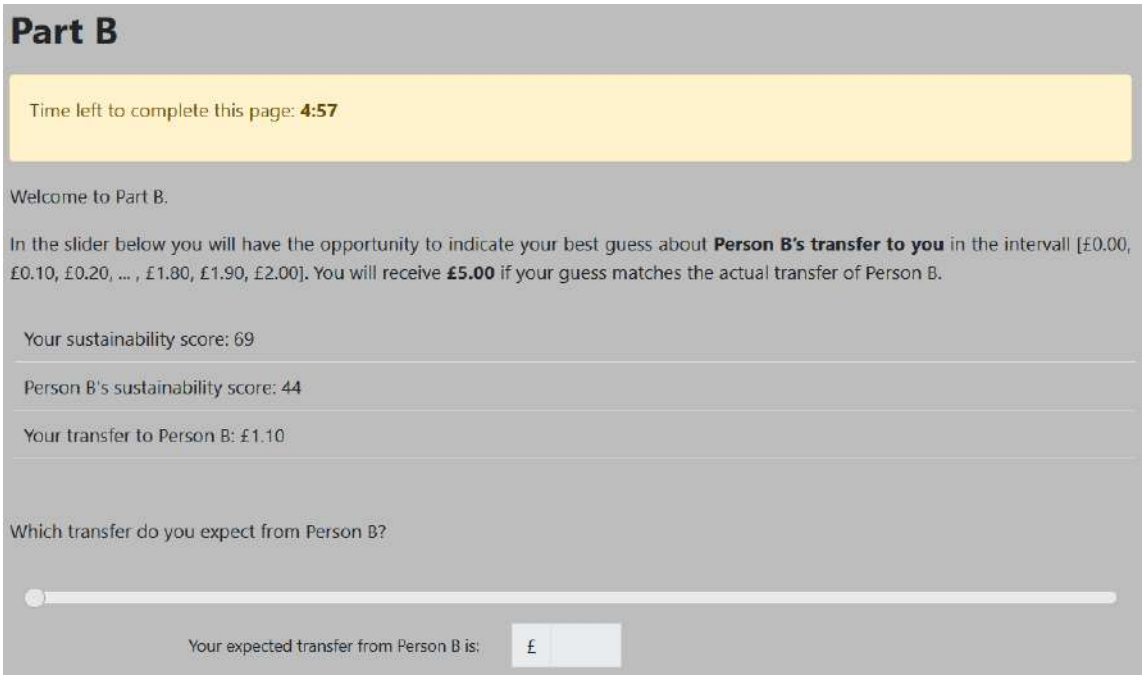


Signaling






Part A - Transfer decision
Time left to complete this page: 4:49
The sustainability score of Person B is 69.
You and Person B will now simultaneously make your transfer decision.
How much of your £2.00 do you want to transfer to Person B?
Your transfer is:
£


Part B
Time left to complete this page: 4:57
Welcome to Part B.
In the slider below you will have the opportunity to indicate your best guess about Person B's transfer to you in the intervall [£0.00, £0.10, £0.20, ... , £1.80, £1.90, £2.00]. You will receive £5.00 if your guess matches the actual transfer of Person B.
Your sustainability score: 69
Person B's sustainability score: 44
Your transfer to Person B: £1.10
Which transfer do you expect from Person B?
Your expected transfer from Person B is:
£

Part C

Time left to complete this page: **4:55**

Welcome to Part C.

You will now have the opportunity to enter your best guess about the **best guess of Person B about your own transfer** in the intervall [£0.00, £0.10, £0.20, ... , £1.80, £1.90, £2.00]. You will receive **£5.00** if your guess matches the expectations of Person B about your own transfer.

Your sustainability score: 69

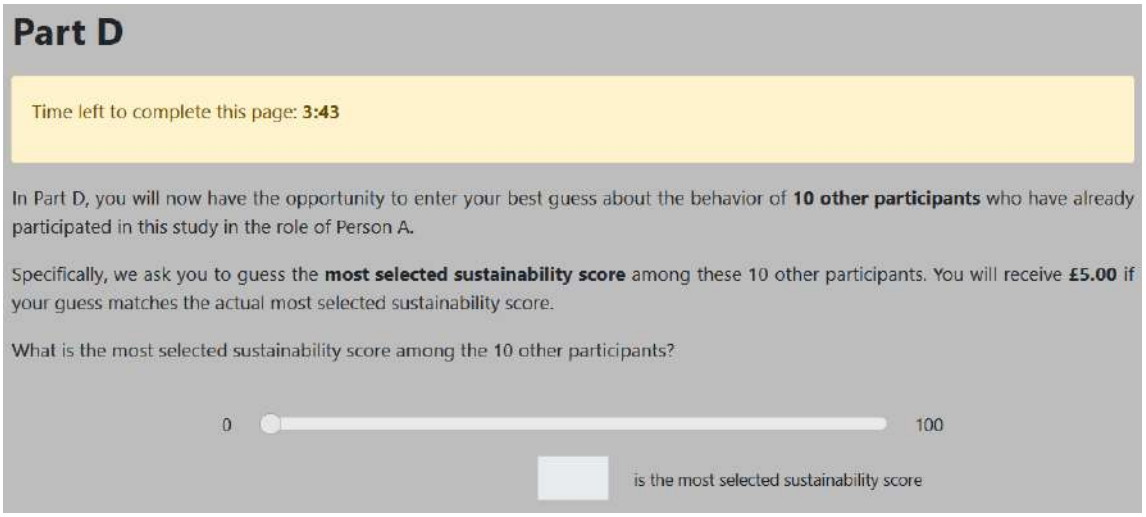
Person B's sustainability score: 44

Your transfer to Person B: £1.10

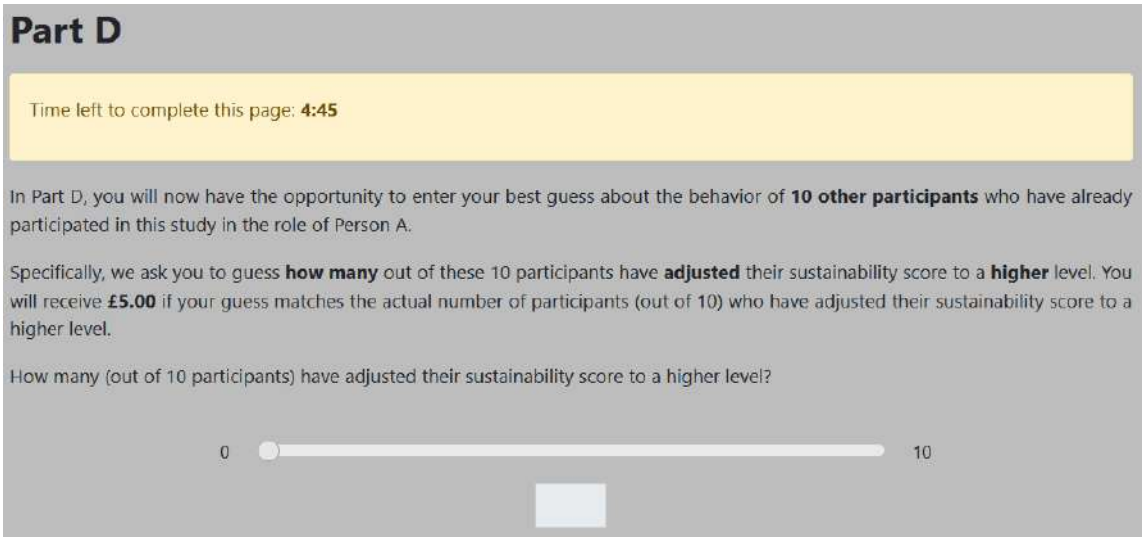
Which transfer does Person B expect from you?

Person B`s expected transfer from you: £

Control



Signaling



Questionnaire

On this screen, we ask you to indicate the hypothetical transfer (out of the initial endowment of £2.00) of **you to Person B** for the following hypothetical **sustainability scores of Person B**. Please use the sliders to choose your respective transfer.

How much would you transfer if the **sustainability score** of Person B would be **0**:

£

How much would you transfer if the **sustainability score** of Person B would be **25**:

£

How much would you transfer if the **sustainability score** of Person B would be **50**:

£

How much would you transfer if the **sustainability score** of Person B would be **75**:

£

How much would you transfer if the **sustainability score** of Person B would be **100**:

£

Questionnaire

On this screen, we ask you to guess the hypothetical transfer (out of the initial endowment of £2.00) of **Person B to you** for the following hypothetical **sustainability scores of yourself**. Please use the sliders to choose your guess about the respective transfer.

How much would Person B transfer to you if your **sustainability score** would be **0**:

£

How much would Person B transfer to you if your **sustainability score** would be **25**:

£

How much would Person B transfer to you if your **sustainability score** would be **50**:

£

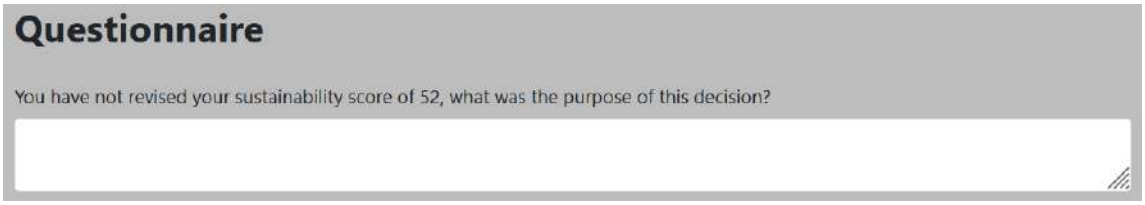
How much would Person B transfer to you if your **sustainability score** would be **75**:

£

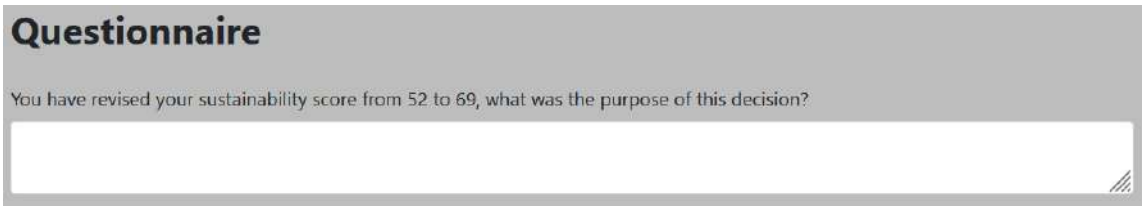
How much would Person B transfer to you if your **sustainability score** would be **100**:

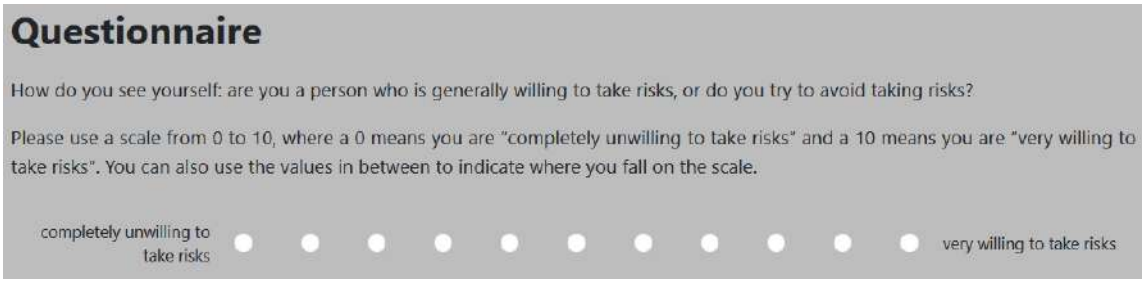
£

Signaling



OR



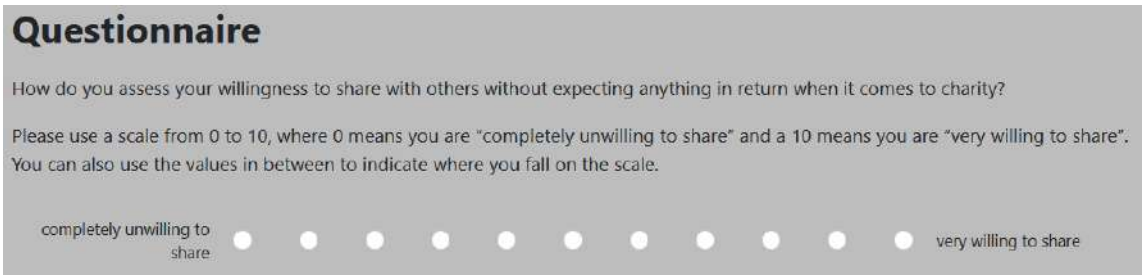

Questionnaire
How do you see yourself: are you a person who is generally willing to take risks, or do you try to avoid taking risks?
Please use a scale from 0 to 10, where a 0 means you are "completely unwilling to take risks" and a 10 means you are "very willing to take risks". You can also use the values in between to indicate where you fall on the scale.
completely unwilling to take risks
very willing to take risks

Questionnaire

How well does the following statement describe you as a person? As long as I am not convinced otherwise, I assume that people have only the best intentions.

Please use a scale from 0 to 10, where 0 means “does not describe me at all” and a 10 means “describes me perfectly”. You can also use the values in between to indicate where you fall on the scale.

does not describe me at all ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ describes me perfectly


Questionnaire
How do you assess your willingness to share with others without expecting anything in return when it comes to charity?
Please use a scale from 0 to 10, where 0 means you are "completely unwillling to share" and a 10 means you are "very willing to share". You can also use the values in between to indicate where you fall on the scale.
completely unwilling to share
very willing to share

Questionnaire

Imagine the following situation: you are shopping in an unfamiliar city and realize you lost your way. You ask a stranger for directions. The stranger offers to take you with their car to your destination. The ride takes about 20 minutes and costs the stranger about 20£ in total. The stranger does not want money for it. You carry six bottles of wine with you. The cheapest bottle costs 5£, the most expensive one 30£. You decide to give one of the bottles to the stranger as a thank-you gift. Which bottle do you give?

- ○ the bottle for 5 £
- ○ the bottle for 10 £
- ○ the bottle for 15 £
- ○ the bottle for 20 £
- ○ the bottle for 25 £
- ○ the bottle for 30 £

Questionnaire

How do you see yourself: Are you a person who is generally willing to punish unfair behavior even if this is costly?

Please use a scale from 0 to 10, where 0 means you are "not willing at all to incur costs to punish unfair behavior" and a 10 means you are "very willing to incur costs to punish unfair behavior". You can also use the values in-between to indicate where you fall on the scale.

Questionnaire

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I recycle as much as I can.	○	○	○	○	○
I always separate food waste before putting out the rubbish when I have the chance.	○	○	○	○	○
I have changed my personal lifestyle in order to reduce waste (e.g., throwing away less food or not wasting materials).	○	○	○	○	○
When I use a computer or mobile to chat, to text, to play games and so on, I always treat others as respectfully as I would in real life.	○	○	○	○	○
I support an aid organization or environmental group.	○	○	○	○	○
I show the same respect to men and women, boys and girls.	○	○	○	○	○
I do things which help poor people.	○	○	○	○	○
I often purchase second-hand goods over the internet or in a shop.	○	○	○	○	○
I avoid buying goods from companies with a bad reputation for looking after their employees and the environment.	○	○	○	○	○

Your final payoff

Your payoff is the following:

- Participation Fee: £1.00
- Part B has been randomly selected for payments. Your payment from this Part is: £0.00

Your total payment of **£1.00** will be credited to your account as soon as possible. Please contact us if you did not receive the payment within 3 business days.

Thank you very much for participating in this study.

C Pre-analysis plan

The pre-analysis plan on *AsPredicted* is available here.

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

2) What's the main question being asked or hypothesis being tested in this study?
Hypothesis 1: Subjects in the signaling treatment adjust their sustainability scores to a higher level.
Hypothesis 2: Subjects' transfers in the control group are increasing by the sustainability scores of their matched partners.

3) Describe the key dependent variable(s) specifying how they will be measured.
Sustainability score: Self-reported sustainability score ranging from 0 to 100.
Transfer: Transfer in the prisoner's dilemma game ranging from £0 to £2.

4) How many and which conditions will participants be assigned to?
Our experiment consists of four parts. In Part A, subjects make transfer decisions in a continuous prisoner's dilemma game after receiving information about their matched partners' self-reported sustainable scores. In a between-subjects design, we vary that subjects either have (signaling treatment) or do not have (control group) the opportunity to revise their sustainability scores after receiving detailed instructions about the decision environment in the prisoner's dilemma game. In Part B, we elicit subjects' beliefs about their matched partners' transfers in the prisoner's dilemma game. In Part C, we elicit subjects' beliefs about their matched partners' beliefs about their own transfers in the prisoner's dilemma game. In Part D, we elicit in a between-subjects design either subjects' beliefs about the mode of the sustainability scores (control group) or the fraction of subjects who adjusted their sustainability scores to a higher level (signaling treatment). This experimental methodology allows to estimate the signaling value of self-reported sustainability scores for cooperation behavior, and test whether subjects exploit this signaling value by adjusting their sustainability scores to a higher level.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

Testing hypothesis 1: We will use a two-sided t-test to compare subjects' first and second self-reported sustainability scores in the signaling treatment. Hypothesis 1 is confirmed if subjects adjust their sustainability scores to a higher level.
Testing hypothesis 2: We will run OLS regressions of subjects' transfers in the control group on the sustainability scores of their matched partners. Hypothesis 2 is confirmed if there is a significantly positive effect of the matched partners' sustainability scores on transfers.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
We will replicate the analysis by excluding subjects who need more than two attempts to answer the control questions in the prisoner's dilemma game correctly.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We plan to collect data of 200 subjects with 100 subjects in the control group and 100 subjects in the signaling treatment. The data collection on Prolific can lead to small deviations from the targeted sample size.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
We will use the incentivized and hypothetical beliefs to provide a richer description of behavior and get a better understanding of the underlying motives.

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Impressum:

ISSN: **2701-3456**
Editors: Tim Büthe, Hanna Hottenrott
Associate Editors: Timm Betz, Sebastian Goerg, Michael Kurschilgen, Amy Pond, Sebastian Schwenen, Janina Steinert, Matthias Uhl
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