Interpersonal Uncertainty as the Origin of Differences in Moral Behavior

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Abstract

We show that several key patterns of prosocial behavior can be explained by interpersonal uncertainty – the uncertainty people perceive about how their actions impact other's utility. Using standard social allocation decisions, we first replicate the classic patterns of ingroup favoritism, selfishness in dictator games, merit-based fairness ideals, and "avoiding the ask" behavior. We then show that these patterns also arise with almost identical distributions in inherently non-social allocation decisions where behavior reflects solely responses to interpersonal uncertainty. In these decisions, decision-makers are paid based on how their allocation would have impacted the recipient's utility, but no one actually receives their allocation. Behavior across social and non-social decisions is highly correlated, and self-reported interpersonal uncertainty predicts behavior in both situations. Our results suggest that several patterns of social behavior previously attributed to disparate motivations may instead have a common, cognitive origin based on interpersonal uncertainty.

Keywords: prosocial behavior, social preferences, ingroup versus outgroup decisions, dictator games, fairness preferences, avoiding the ask, interpersonal uncertainty
JEL Classification: C91, D01, D91

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"Every man feels his own pleasures and his own pains more sensibly than those of other people. (...) After himself, the members of his own family (...) are naturally the objects of his warmest affections. (...) He knows better how every thing is likely to affect them, and his sympathy with them is more precise and determinate, than it can be with the greater part of other people. It approaches nearer, in short, to what he feels for himself." (Smith, 1790, p. 198).

1 Introduction

People can only experience their own utility but not others' utility. Thus, when making decisions that affect others, people are inherently uncertain about how their actions might impact others' utility. We call this *interpersonal uncertainty*. Crucially, interpersonal uncertainty may be perceived differently depending on the person making the decision, their relation with those impacted, and the decision-situation itself. Accordingly, interpersonal uncertainty may differentially influence decisions that involve others.

In this paper, we show that people's response to interpersonal uncertainty can explain people's tendency (i) to favor members of their ingroup over others (ingroup-favoritism), (ii) to disproportionately favor themselves at the cost of others (selfishness), (iii) to redistribute more from windfall endowments compared to earned endowments (merit-based fairness ideal), and (iv) to avoid situations where one is solicited to make prosocial choices (avoiding the ask behavior). Our results thus suggest a unified explanation for several key patterns of the literature on prosocial behavior.

In our preregistered experiments, subjects make a choice in a *social* and a *non-social* decision scenario for each of the four aforementioned paradigms of prosocial behavior. The *social* decision is a standard decision task used in the literature to document the respective pattern. The *non-social* decision mimics the *social* decision but strips it of its social features except for interpersonal utility comparisons, holding the degree of interpersonal uncertainty fixed. Behavior in *non-social* then solely reflects responses to interpersonal uncertainty, allowing us to assess their relevance in generating the previously mentioned patters of prosocial behavior.

We illustrate our experimental approach with the ingroup-favoritism paradigm. In the *social* decision, a decision maker (DM) has to allocate $100 between two randomly matched individuals. Only one of the individuals belongs to the DM's social group, making them an ingroup member, while the other is an outgroup member. The two individuals receive the money allocated to them by the DM in the form of gift cards, six weeks after the study date. The decision thus features direct consequences for the ingroup and the outgroup member. Allocating more money to the ingroup member than the outgroup member in such a decision is typically interpreted as an expression of an explicit *taste* or *preference* for the ingroup. Mathematically, this is captured by the DM experiencing a higher marginal utility from the benefit received by the ingroup member (U_{in}), than from the benefit received by the outgroup member (U_{out}).

We design the *non-social* decisions in the ingroup-favoritism paradigm to rule out any such taste or preference based channel but retain the interpersonal uncertainty. As before, the DM splits \$100 between an ingroup and an outgroup member. However, the decision does not have any consequences for the ingroup or outgroup member. Instead, the DMs themselves are paid the sum of the ingroup and outgroup members' utilities U_{in} and U_{out} from receiving the money. This works as follows: we first measure U_{in} and U_{out} by eliciting the ingroup and outgroup members' willingness-to-pay (WTP) to receive \$100 gift card money in six weeks. The DMs are paid the sum of the ingroup and outgroup member's WTP, weighted by how much money the DM allocated to them, respectively. Importantly, because both WTPs contribute symmetrically to the DM's payment, the DM no longer has any taste or preference based reason to favor either. However, since the DMs do not know the ingroup or outgroup member's WTP, they still face interpersonal uncertainty.

In particular, people might hold different subjective beliefs about how U_{in} and U_{out} are distributed in the population. We hypothesize that higher familiarity and more interactions with one's ingroup might lower the interpersonal uncertainty the DM perceives over U_{in} as compared to U_{out}, thus making the former a "safer bet". As we derive in Theorem 1 in Section 2, this difference in interpersonal uncertainty is enough to generate the familiar pattern of ingroup favoritism under risk-aversion.

Our results show that the interpersonal uncertainty in the *non-social* decisions is sufficient to replicate the same pattern of ingroup-favoritism observed in our *social* decisions. Using shared hobbies/interests, political views, and religious beliefs as groups, subjects allocate on average \$62 (out of \$100) to the ingroup member in the *social* decisions and \$60 to the ingroup member in the *non-social* decisions. Not only the average allocations but also the distributions are similar, as a Kolmogorov–Smirnov test fails to reject the null that the allocations in social and non-social decisions are generated from different distributions. Moreover, since each subject makes both social and non-social decisions in a randomized order, we can compare social and non-social behavior within-subject. We find that both decisions are highly correlated on the individual level, with a correlation coefficient of $r = 0.53$. In fact, the median subject makes the same choice in the *non-social* and *social* decision.

We run several robustness treatments to ensure that the observed similarity between the *social* and *non-social* decisions is not confounded by subjects being confused or inattentive about the incentives. Subjects complete several comprehension quizzes and the decision-screens saliently remind subjects about the incentives. Further, to directly confirm that subjects indeed understand the *non-social* incentives, we conduct two robustness treatments. In one treatment, we increase the multiplier on the ingroup member's WTP, while in the other treatment we increase the multiplier on the outgroup member's WTP in the *non-social* decision. We find that subjects comprehend and react rationally to both changes: ingroup favoritism increases in the former and flips to outgroup favoritism in the latter. In a third robustness treatment, we test whether it is also possible to set the *non-social* incentive such

that group favoritism in either direction is eliminated. For this purpose, we conducted the Rawlsian *non-social* treatment, where subjects are incentivized with the minimum of the ingroup and outgroup member's utility ($\min\{U_{in}, U_{out}\}$). In our theoretical framework, this incentive eliminates group favoritism, and we indeed find that subjects' allocations are symmetrically distributed around the even split, showing no group favoritism in either direction. In sum, these robustness treatments demonstrate that behavior in the *non-social* decisions is the result of conscious and deliberate decision-making.

Finally, we also measure a subject's perceived interpersonal uncertainty towards the ingroup and outgroup members through the following Likert scale question, asked separately about group members: "How certain are you about how much the individual (. . .) would value Amazon gift card money?". We find that subjects indeed perceive higher uncertainty about the outgroup. Further, higher relative uncertainty over the outgroup compared to the ingroup is significantly associated with stronger ingroup favoritism in the *social* ($r = 0.30$) and *non-social* decisions ($r = 0.17$).

Next, we investigate the importance of interpersonal uncertainty for self versus other behavior in the context of the dictator game. As before, subjects face both a *social* and a *non-social* decision scenario, in randomized order. The *Self social* decision is the standard dictator game where they share \$100 in gift card money between themselves and a randomly matched another individual. Replicating classical dictator game behavior, subjects allocate more to themselves: on average \$68 out of the \$100. Typically, this behavior is interpreted as "selfishness": individuals care more about themselves than they care about others.[1]

To identify the role of interpersonal uncertainty in dictator game behavior, our *Self non-social* treatment removes the scope for the "selfishness" channel. In the *Self non-social* decision, DMs split \$100 and are paid the sum of their own WTP and the WTP of the other person for the gift card money, weighted by the respective allocations. As such, the decision no longer features consequences for others. Since both WTPs contribute symmetrically to the DM's payment, DM's selfishness no longer predicts a greater allocation to themselves. But, as subjects know their own utility (WTP) but not other's utility, the former might be perceived as the safer bet. Thus, we hypothesize that the inherent interpersonal uncertainty is sufficient to generate "selfish looking choices" under risk-aversion.

We find that behavior in the *Self non-social* decision closely resembles behavior in the *Self social* decision: 66% and 62% of subjects allocate more money to themselves respectively. Similarly, a comparable number of subjects (22% vs 29%) implement the even split in *Self non-social* and *Self social*. On average, subjects allocate \$68.05 to themselves in *Self social* and \$67.02 in *Self non-social*. The similarity extends to within-subject comparisons, as the two decisions are highly correlated with a coefficient of $r = 0.71$. This makes the *Self non-*

[1]Historically, selfishness has been used to describe people who care only for themselves, we use the word in a less strict sense here.

social decision one of the strongest predictors of dictator game behavior compared to other predictors considered in the literature.

As our third application, we study the increased hesitancy to take from other's endowment when the endowment was earned versus not earned, in the context of dictator games. Compared to the *Self social* decision in which the dictator splits a windfall endowment of \$100, in our *Taking social* decision, the dictator split a \$100 endowment that the recipient has earned for themselves. This difference has a significant impact on allocations. Compared to the \$68.05 that subjects allocate to themselves in the *Self social* decision, subjects in *Taking social* allocate (take) only \$40.57 for themselves. Such behavior has a natural explanation based on merit-based fairness concerns or norms: taking other's earned money is considered more unfair than keeping money that is a pure windfall endowment.

To investigate the role of interpersonal uncertainty in such behavior, our *non-social* decision strips the choice of fairness concerns and norm-considerations, while retaining its interpersonal uncertainty. Our *Taking non-social* decision is identical to the *Self non-social* with one twist: the DM's incentive no longer depends on the other individual's WTP but on their willingness-to-accept (WTA), which measures their willingness to give up a \$100 gift card they earned. Accordingly, DMs split \$100 to maximize the sum of their own WTP and the other individual's WTA. If DMs believe that WTA is on average higher than WTP, which we validate empirically, then the induced incentive would lead dictators to keep less money for themselves. Our results confirm this hypothesis: Subjects allocate only \$55.08 to themselves in *Taking non-social*, a significant decrease from the \$67.02 they allocated to themselves in self non-social subjects. Moreover, allocation choices in *Taking non-social* are significantly associated with taking behavior in *Taking social*. These results suggest that the change in behavior from the classical dictator game to the taking paradigm is not exclusively driven by fairness considerations but instead is also affected by the changing utilitarian calculus made under uncertainty across the two scenarios.

As our fourth and last application, we investigate the finding that people oftentimes try to avoid situations that force them to make a prosocial choice. For example, a majority of subjects prefers to earn x instead of participating in a dictator game where they can allocate an endowment of $y > x$ between themselves and another individual. We replicate this behavior in our *Avoid social* treatment. The typical explanation of the literature for this behavior is that people want to avoid the pressure of giving, caused by image concerns or emotional responses. We propose a new explanation based on interpersonal uncertainty: if interpersonal utility comparisons are uncertain, then one would also expect them to be *cognitively costly*. Consequently, DMs may want to avoid making such comparisons to avoid the cognitive costs, independently of the tendency to avoid being pressured into prosocial giving.

We design a *Avoid non-social* treatment that strips the *Avoid social* decision of any demand for prosocial actions while retaining the uncertainty and cognitive cost of interpersonal

comparisons. Subjects are given a choice between receiving x, versus, earning money by participating in our *non-social* dictator game with a starting endowment of $y > x$. Since the *non-social* dictator game does not feature prosocial giving, there is no pressure to give. However, we still replicate the same pattern of behavior displayed in the *Avoid social* decision with our *Avoid non-social* decision, and both decisions are correlated on the individual level. Our results thus provide evidence that aversion towards prosocial decisions is generated by aversion towards the cognitive cost of dealing with interpersonal uncertainty.

Related literature. Our results in the four paradigms connect two strands of literature that jointly investigate how behavior typically attributed purely to preferences may alternatively be driven by cognitive limitations.

The first literature, which is primarily theoretical, explains a range of behavioral patterns mainly in the domain of intertemporal decisions through people's cognitive response to subjective uncertainty. For example, risk and time preferences closely intertwine when DMs are uncertain about future consumption (Sozou, 1998; Dasgupta and Maskin, 2005; Halevy, 2008; Chakraborty, Halevy, and Saito, 2020) or preferences (Amador, Werning, and Angeletos, 2006). Moreover, present-biased preferences can be explained by DMs behaving cautiously under subjective uncertainty about future tastes (Chakraborty, 2021).[2] While this literature focuses on theoretically characterizing a logical equivalence between subjective uncertainty and time preference patterns, we study empirically the connection between subjective uncertainty and prosocial behavior. In particular, our non-social treatments allow us to assess the extent to which subjective uncertainty in the form of interpersonal uncertainty drives standard patterns of social behavior.[3] In addition, we directly measure self-reported interpersonal uncertainty and relate it to behavior.

A second and more recent literature re-interprets well-known behavioral patterns such as probability weighting and hyperbolic discounting as a *preference-insensitivity* driven by complexity responses. For instance, facing the cognitive difficulty of processing and aggregating multiple attributes of lotteries or temporal payoffs, DMs may not fully integrate parameters such as probabilities of prizes (Oprea, 2024) or the magnitude of the time delay (Enke, Graeber, and Oprea, 2023) into their decisions.[4] Both papers employ "mirror" decision tasks that eliminate uncertainty and time-delays from standard risk and intertemporal decisions but retain their complexity. They show that these mirrors replicate the familiar insensitivity patterns of probability weighting and hyperbolic discounting respectively. We adopt a similar

[2]A related literature investigates empirically how people predict their own future taste (Kaufmann, 2022), forecast other's tastes (Bushong and Gagnon-Bartsch, 2024), and learn from others' actions in the presence of taste uncertainty (Gagnon-Bartsch and Bushong, 2023).

[3]We thus conceptually and empirically differ from papers that investigate social behavior in the presence of objective uncertainty induced by the experimenter about the mapping of prosocial actions and consequences (e.g., Brock, Lange, and Ozbay, 2013; Exley, 2016; Cettolin, Riedl, and Tran, 2017).

[4]Relatedly, Enke and Graeber (2023) investigate how the complexity of maximizing choices induces insensitivity in choice under risk, belief formation and forecasts, while Abeler and Jäger (2015) study how the complexity of the tax system increases insensitivity towards marginal tax rates.

strategy to show the relevance of interpersonal uncertainty for social decisions. With this approach and results, we provide two main insights for the literature on complexity: First, even the simplest social decision, a Dictator game, may be complex to people because they need to perform interpersonal utility comparisons. Second, the complexity of interpersonal comparisons, which potentially is caused by or co-exist with subjective uncertainty, might help to explain patterns of social behavior that have so far not been attributed to preference-insensitivity. Our fourth "Avoiding the ask" paradigm, provides suggestive evidence in this direction.

Furthermore, by studying classical patterns of prosocial behavior, our paper connects several strands of the large economic literature on prosocial behavior. With our application to ingroup versus outgroup decisions, we contribute to the large literature on ingroup favoritism (also labeled parochial altruism and moral universalism, see Enke, 2023, for a recent overview). By studying dictator game behavior, we contribute to the large literature on prosocial decisions that studies self versus other tradeoffs (see Capraro, Halpern, and Perc, 2022; Fehr and Charness, 2023, for recent overviews). Our application to attitudes towards earned versus windfall endowments relates to the large literature on fairness preferences and attitudes (see Cappelen, Falch, and Tungodden, 2020, for an overview). Specifically, we contribute to the literature that shows that people allocate more money to themselves (the other person) in dictator games if they (the other person) earned the money to be allocated instead of having it received as windfall.[5] Lastly, by studying "avoiding the ask" decisions, we contribute to the literature that documents people's avoidance behavior towards prosocial decisions.[6] Each of the four strands has so far analyzed their respective behavioral patterns separately, and supplied their own distinct explanations. Using a comprehensive experimental strategy, we provide a unified explanation for these patterns.

The remainder of the paper is organized as follows: In section 2, we present a simple model that highlights how interpersonal uncertainty can generate patterns of prosocial behavior. In section 3, we describe the experimental design and results from the *social* and *non-social* decisions using the Ingroup versus outgroup paradigm. Subsequently, we move to the design and results from the Self versus other paradigm (dictator game) in Section 4, followed by the Giving versus Taking paradigm in Section 5, and lastly the Avoiding the ask paradigm in Section 6. Section 7 concludes.

[5]See Ruffle (1998), Cherry (2001), Cherry, Frykblom, and Shogren (2002), Cherry and Shogren (2008), Oxoby and Spraggon (2008), and Krupka and Weber (2013).

[6]See DellaVigna, List, and Malmendier (2012), Lazear, Malmendier, and Weber (2012), Andreoni, Rao, and Trachtman (2017), and Adena and Huck (2020).

2 Conceptual framework

In this section, we show that a simple model of interpersonal uncertainty can generate canonical patterns from the literature on prosocial behavior.

2.1 Defining interpersonal uncertainty

We consider decision-situations in which a decision-maker (DM) has to choose between different actions, of which at least one has consequences for other people. Our central assumption is that the DM perceives *Interpersonal Uncertainty* about how her actions impact others' utility. That is, she is uncertain about the mapping between an action's outcome for others and the utility or value that others receive from the outcome.[7] Specifically, suppose a DM has to allocate $\$100$ between two recipients. In our leading example, one recipient shares a social group affiliation with the decision-maker (ingroup member) while the other is a member of a different group (outgroup member), making the decision an ingroup versus outgroup tradeoff. In such allocation decisions, interpersonal uncertainty is the subjective uncertainty the DM perceives about how much each recipient values every allocated dollar. For simplicity, we assume that the DM is probabilistically sophisticated and believes that dollars are valued non-negatively. Interpersonal uncertainty then means that the DM believes the per-dollar valuation of recipient j is distributed as $v_j \sim f_j$, where f_j is a probability distribution taking non-negative values. We further assume that the distributions are statistically independent between recipients.

Assumptions about interpersonal uncertainty. We assume that these belief distributions have two key plausible features. First, a DM understands that different recipients might derive different value from the same allocated dollar amount based on their personalities, past experiences, socioeconomic status, or tastes. Thus, the belief distributions over the valuations of others are non-degenerate.

Second, the belief distributions for different recipients might systematically differ, depending on the DM's familiarity with the recipients. For instance, a DM might think that a shared interest or a shared identity is indicative of shared past experiences, economic status, and tastes. As a consequence, DMs may feel more familiarity and less interpersonal uncertainty about the ingroup. Similarly, in situations involving the DM herself as one of the two recipients, DMs might naturally face lower uncertainty about themselves than others: we are naturally most familiar with our own tastes and circumstances than those of others.

Formally, we make the following assumptions on the differences between f_1 and f_2, whereby f_1 denotes the DM's belief about the ingroup member's valuation and f_2 the belief about the outgroup member's valuation:

[7] Therefore, it differs from uncertainty about the mapping between actions and outcomes, for instance when one is uncertain whether a donation will actually be delivered to a recipient.

(i) Existence of interpersonal uncertainty: f_1 and f_2 are non-degenerate probability distributions.
(ii) Heterogeneity in interpersonal uncertainty: f_2 is a mean-preserving spread[8] of f_1. Thus, DMs perceive more uncertainty about outgroup valuations than about ingroup valuations, while, on average, ingroup and outgroup are believed to have equal valuations for a dollar: $Ev_1 = Ev_2$.

Note that we use the assumption of equal expected values simply as a benchmark: our key insight is that interpersonal uncertainty can generate ingroup favoritism even under equal expected values.

2.2 Choice behavior under interpersonal uncertainty

We investigate the case of unbiased Utilitarian preferences, which means the utility the DM receives from allocating $x \in [0, 100]$ to the ingroup and $(100 - x)$ to the outgroup is $u_{UTIL} = v_1 x + v_2(100 - x)$. As v_1, v_2 are random variables, she maximizes expected utility:

$$EU(x) = E_{v_1 \sim f_1, v_2 \sim f_2} U\left(v_1 x + v_2(100 - x)\right)$$

where $U' > 0$ and $E_{v_i \sim f_i}$ is the expectation with respect to f_i.

Given this setup, the optimal allocation depends on the belief distributions f_1 and f_2. If both are degenerate with different expected values, the DM will allocate 100 to the recipient with the higher expected value.[9] Theorem 1 provides the optimal solutions in the presence of non-degenerate distributions. It will serve as our prediction for both the *social* and *non-social* decisions we later employ in our experiments.

Theorem 1. *Suppose individual i has unbiased Utilitarian preferences and is risk-averse ($U'' < 0$). If f_1 and f_2 are non-degenerate, independent probability distributions, then*
i) Equal division: If $v_1 \overset{d}{=} v_2$ (i.e, $f_1 = f_2$) then i's optimal allocation is $x = 50$.
ii) Ingroup favoritism: If f_2 is a mean preserving spread of f_1, then i's optimal allocation is $x \in (50, 100)$.
iii) Comparative statics: Suppose the valuations of the two groups are distributed as v_1 and $c+v_2$ for some constant c and independent random variables $v_1 \sim f_1, v_2 \sim f_2$. Under arbitrary CARA preferences[10], or under CRRA coefficient< 1, the optimal allocation satisfies $dx^*/dc \leq 0$.

[8] Of two distributions yielding equal expected values, g_2 is said to be a mean-preserving spread of g_1 if it is possible to get from g_1 to g_2 by a sequence of operations which shift pairs of probability weights on either side of the mean farther away while leaving the mean unchanged.

[9] In the trivial case of degenerate distributions with equal expected value, the optimal allocation is non-unique, as the DM is indifferent between all possible allocations.

[10] For a utility function $U(w)$, the coefficient of absolute risk-aversion (ARA) is defined as $r_1(w) = \frac{-U''}{U'}$ and relative risk-aversion (ARA) is defined as $r_2(w) = \frac{-wU''}{U'}$. CARA and CRRA imply r_1 and r_2 are constant respectively.

For the proof, see Appendix Section A. Part (i) follows from symmetry: if the two recipients are equal in all relevant dimensions, then a risk-averse DM wants to hedge against interpersonal uncertainty by allocating equally among them. However, if the DM perceives a higher interpersonal uncertainty about one of the recipients, she allocates more to the other recipient. Accordingly, (ii) shows that a DM believing that outgroup members are not less deserving of receiving money than ingroup members will still allocate more money to the latter if she perceives less interpersonal uncertainty for them. Finally, part (iii) shows that the DM would decrease the allocation to the ingroup (or the allocation to herself in the dictator game) if her belief about the outgroup's valuation increases.[11]

Hence, in our setting, ingroup favoritism is generated by responses to uncertainty. In contrast, the economic literature generally interprets ingroup favoritism as an expression of explicit ingroup preferences, modeled as a higher utility weight for ingroup compared to outgroup members (e.g., Tabellini, 2008). In psychology, it is often interpreted as an expression of moral values (e.g., Graham et al., 2013). However, once interpersonal uncertainty is present, risk-aversion is sufficient to generate ingroup favoritism, differential weights, or the existence of group dependent moral values are no longer necessary. Similarly, various explanations for the fact that people allocate more, but not all of the endowment to themselves in dictator games (selfishness) have been brought forward (for a recent overview, see e.g., Capraro, Halpern, and Perc, 2022). Most of these models either implicitly or explicitly assume that DMs weight their own utility differently from others' utility. We show that perceiving and responding to interpersonal uncertainty is sufficient to create more self-giving in dictator games without requiring differential weights.

Will every commonly used welfare criterion deliver ingroup favoritism (or selfishness) under the right parameters given our assumptions about interpersonal uncertainty? Perhaps not surprisingly, Rawlsian preferences – one of the most discussed welfare criterion – are insensitive to interpersonal uncertainty. Under Rawlsian preferences, only the utility of the least well-off recipient matters. In our context, this means the utility individual i receives from allocating x to the ingroup member and $(100-x)$ to the outgroup member is $u_{RAWLS} = \min\{v_1 x, v_2(100-x)\}$. As Theorem 2 shows, a decision-maker will then split the money equally independent of interpersonal uncertainty differences between recipients.

Theorem 2. *Suppose individual i has Rawlsian preferences. Then irrespective of i's risk attitude ($U'' \leq 0$ or $U'' \geq 0$), her optimal allocation is $x = 50$, in both the following cases, i) $f_1 = f_2$, and, ii) f_2 is a mean preserving spread of f_1.*

For the proof, see Appendix Section A. We will use this result later in a robustness analysis to show that people respond to our induced incentives in the expected direction.

[11] Under extreme risk-aversion, when c increases, the marginal return from the states with high-v_2 is so low that on the margin, subjects might prefer to allocate more to v_1 to safeguard their utility in the states where v_2 is low.

Relation to empathy. Our concept of interpersonal uncertainty has a natural connection to cognitive empathy – people's "capacity to engage in the cognitive process of adopting another's psychological point of view" (Shamay-Tsoory, 2011). We would expect perceived interpersonal uncertainty and the capacity for empathy to be correlated on the individual level, as both rely on the ability to simulate other's experiences, which in term may be driven by familiarity or similarity.[12] Yet, the two concepts are not identical, with the distinguishing factor being the mechanism through which they influence behavior. In our framework, people's response to the perceived uncertainty about their action's impact on others shapes choice behavior. In contrast, empathy is typically understood as influencing decisions through emotional responses, as formulated for instance by the empathy-altruism hypothesis (Batson et al., 1991).

2.3 Complexity costs of interpersonal uncertainty

Interpersonal uncertainty may not only affect prosocial decisions directly but also people's choice of whether to sort into making such decisions in the first place. Suppose the DM can sort into one of two possible decision environments: one with an opportunity to make a prosocial choice that impacts other's utility and one without. In the prosocial choice environment, the DM is endowed with an amount $M = \$100$ and can allocate the amount between herself (x) and another participant ($y = 100 - x$). In the environment without the prosocial choice, the DM receives a possibly different amount M' while the other agent receives nothing ($y = 0$). As before, the DM's utility depends on the payoffs x and y, to which we add the possibility that the utility depends on the environment, D (see e.g., Lazear, Malmendier, and Weber, 2012). Hence, $U = U(D, x, y)$, where $D = 1$ if the environment contains a choice that impacts other's utility and $D = 0$ otherwise.

Importantly, we hypothesize that making interpersonal utility comparisons is cognitively costly, precisely because it requires difficult comparisons across uncertain dimensions.[13] Following a recent literature in economics showing that complexity creates costs to DMs (see e.g., Oprea, 2020), we modify our previous utility function to include the notion of cognitive costs induced by the complexity of making choices under interpersonal uncertainty:

Assumptions on the cognitive costs of complexity. *No sharing $D = 0$:* By assumption, $x = M'$ and $y = 0$. A DMs utility is then $EU(0, M', 0) = v_1 M'$ where v_1 is her per-dollar valuation.
Sharing $D = 1$: A DMs utility is $EU(1, x, 100 - x) = E_{f_1,f_2}(v_1 x + v_2(100 - x)) - C(f_1, f_2)$ where v_1, v_2 are the respective per-dollar valuations, and $C(f_1, f_2)$ is the cognitive cost of

[12] See for instance Andriesa et al. (2023) for evidence on how similarity influences and interacts with empathy.

[13] Martínez-Marquina, Niederle, and Vespa (2019) provide causal evidence of uncertainty inducing complexity.

making interpersonal utility tradeoffs.

We allow the cost C to be a function of the interpersonal uncertainty, summarized by f_1, f_2. For example, C could be increasing in the variance of both distributions or be increasing in the reasonably defined distance between the two distributions f_1, f_2. Given this setup, a DM decides to sort out of the sharing environment only when

$$\begin{aligned} U(0, M', 0) &\geq \max_{x \in [0,100]} E_{f_1,f_2} U(1, x, 100 - x) \\ \iff E_{f_1,f_2} v_1 M' &\geq \max_{x \in [0,100]} E_{f_1,f_2} \left(v_1 x + v_2 (100 - x)\right) - C(f_1, f_2) \\ \iff C(f_1, f_2) &\geq \max_{x \in [0,100]} E_{f_1,f_2} \left(v_1 x + v_2 (100 - x)\right) - E_{f_1,f_2} v_1 M' \end{aligned}$$

If $M' < 100$, the right-hand side is always positive. Thus, if $C = 0$, the DM would never sort out of the distribution environment at $M' < 100$. Conversely, at $M' < 100$ the DM sorting out of the sharing environment at $M' < 100$ reveals $C > 0$.

Therefore, even unbiased utilitarians who treat other's utility in principle the same as their own may avoid engaging in prosocial decisions. The additional input of cognitive costs thus provides a rationale for the behavior that people simultaneously give to complete strangers even in private, non-strategic situations, but at the same time avoid such situations if given the chance.

3 Ingroup versus outgroup paradigm

We start by studying ingroup versus outgroup decisions before expanding to further prosocial decisions in later sections.

3.1 Experimental design

The experimental sessions using the ingroup-outgroup paradigm (and the other paradigms we introduce later) feature two distinct decision situations: *social* decisions and *non-social* decisions. In every paradigm, the *social* decision is a classical decision task from the literature on prosocial behavior. Thus, for the ingroup versus outgroup paradigm, the *social* decision is a "bystander" money-allocation game – one of the standard experimental decision tasks used in economics to identify differential attitudes towards ingroup and outgroup members (Enke, Rodríguez-Padilla, and Zimmermann, 2022). The game features three individuals, (i) a decision-maker (DM), (ii) one individual who shares a social group with the DM (ingroup member), and (iii) another individual who is a member of a different group than the DM (outgroup member). The DM is asked to allocate a fixed amount of money between the ingroup and outgroup members. The degree to which DMs allocate more money to the

ingroup member reveals their degree of ingroup favoritism.[14]

Our novel contribution is to design and implement another set of situations, the *non-social* decisions. In these decisions, we remove any consequences for others but retain the inherent interpersonal uncertainty about the consequences for others. Next, we explain the details of the *social* decisions and the *non-social* decisions.

***Ingroup social* decisions.** In total, decision-makers face three *Ingroup social* decisions, in each allocating $100 between one ingroup and one outgroup member. Specifically, they allocate money (i) between someone who "shares your interests/hobbies" versus "has different interests/hobbies than you", (ii) between someone who "shares your political views (e.g., a fellow left-winger, or a fellow right-winger, etc.)" versus someone who "has different political views than you" and (iii) between someone who "shares your religious beliefs (e.g., a fellow Christian, or a fellow atheist, etc.)" versus someone who "has different religious beliefs than you".[15] The allocated money is sent to the ingroup and outgroup member six weeks from the date of the experiment in the form of Amazon gift card money. Thus, DM's allocation decisions have consequences for the utility of the individuals involved.

***Ingroup non-social* decisions.** In our *Ingroup non-social* decisions, we remove any consequences the decision has to other individuals. Instead, DM's choice solely determines their own payoff. DM's split $100 between an ingroup and outgroup member, using the same groups as in *social*, and the DM's payoff Π is determined by the following formula:

$$\Pi\left(x_{in}, x_{out}\right) = x_{in} \cdot WTP_{in} + x_{out} \cdot WTP_{out}.$$

where x_{in} is the money split in favor of the ingroup member, and $x_{out} = 100 - x_{in}$ is the money split in favor of the outgroup member. WTP_i denotes the ingroup and outgroup member's respective WTP for a $100 Amazon gift card to be received in six weeks, elicited using a valuation task (explained below). To scale the incentive, the WTP is divided by 100, representing an individual's WTP per gift card dollar. For example, if the DM split $40 and $60 in favor of the ingroup and outgroup member respectively, and the elicited WTP of "$100 Amazon gift card money received in 6 weeks" for the ingroup member were $80 and for the outgroup member $60, then the DM's payoff would be

$$\Pi\left(40, 60\right) = 40 \cdot \frac{80}{100} + 60 \cdot \frac{60}{100}.$$

By using the WTP of ingroup and outgroup members, we induce Utilitarian preferences because we incentivize the DMs to maximize the sum of the WTPs, weighted by the al-

[14]Particularly, ingroup favoritism is identified independent of the decision-maker's self-interest. Past research has shown that behavior in such bystander allocation games shows a high test-retest correlation, works equally well when posed hypothetically and incentivized, and is highly correlated with related psychological questionnaires (Enke, Rodríguez-Padilla, and Zimmermann, 2022).

[15]The wording is taken directly from Enke, Rodríguez-Padilla, and Zimmermann (2022).

locations made in their favor. Since DMs do not know the actual WTPs of the matched individuals, this interpersonal uncertainty transforms the *social* decision into an uncertain subjective lottery choice. At the same time, for the WTP we use the same object that is distributed in the *Ingroup social* decision, thus keeping the degree of interpersonal uncertainty constant between the *Ingroup social* and *Ingroup non-social* decision. Importantly, the ingroup and outgroup member's WTP enter the utilitarian allocation rule symmetrically, so any differences in allocations are driven by differences in uncertainty about the WTPs. We can thus use the comparison of the *Ingroup social* and *Ingroup non-social* decision to assess the relevance of interpersonal uncertainty in driving ingroup favoritism.

Valuation task. To elicit the willingness-to-pay (WTP), we use a standard multiple-price-list (MPL). Subjects face a series of binary decisions between (i) receiving a $100 Amazon gift card in six weeks and (ii) a monetary amount paid today which increased in steps.[16] This procedure reveals the current-day dollar equivalent of receiving gift card money.[17]

Minimizing inattention and confusion. A principal concern when interpreting behavior in the *non-social* decisions is that subjects are inattentive to the incentive structure or misunderstand the parameters of the decision. We employ several measures to mitigate the scope for these confounding factors. First, before completing the *non-social* decisions, decision-makers complete the valuation task themselves. That is, they face the WTP elicitation for a $100 Amazon gift card in six weeks themselves, which familiarizes them with the calculation of the WTP for the incentive. Second, we included multiple comprehension questions that test whether DM's understood that the *non-social* decisions only have consequences for themselves, not for the other individuals. If they did not answer all questions correctly, we explicitly explained them their errors and highlighted the correct answers. Thus, this procedure makes it particularly salient that the *non-social* decisions are different from the social. Third, to further minimize inattention, we include an explicit disclaimer on every decision screen for the *non-social* decisions that states "Reminder: your choice only determines your own payment, it does not affect the two individuals." On the decision screen, we also provided DM's with the option to revisit the instructions.

In addition to these measures to mitigate the role of inattention and confusion, we designed a series of robustness treatments to assess the extent to which limited attention or confusion could drive behavior in our experiments. These treatments vary elements of the incentives, and are described in detail in Section 3.4.

Procedure. We randomized the order of decisions. Half of the decision-makers first face the *social* decision and then the valuation task and *non-social* decision. The other half first

[16]We enforced single switching by automatically filling out the list above and below a subject's choice.

[17]We used Amazon gift card money because it is easy to pay anonymously online, the specific gift cards are non-refundable and non-fungible, and because subjects valuation generally differs from the dollar value of the gift card. We implemented the time lag to generate additional variation in subjects' valuation.

face the valuation task and *non-social* decision, and then subsequently the *social* decision. We did not announce beforehand that other decisions would follow the initial decisions, therefore minimizing the scope for contagion from one treatment to the other. This design allows us to analyze within-subject behavior, and also compare behavior between-subject by only looking at the first set of decisions.

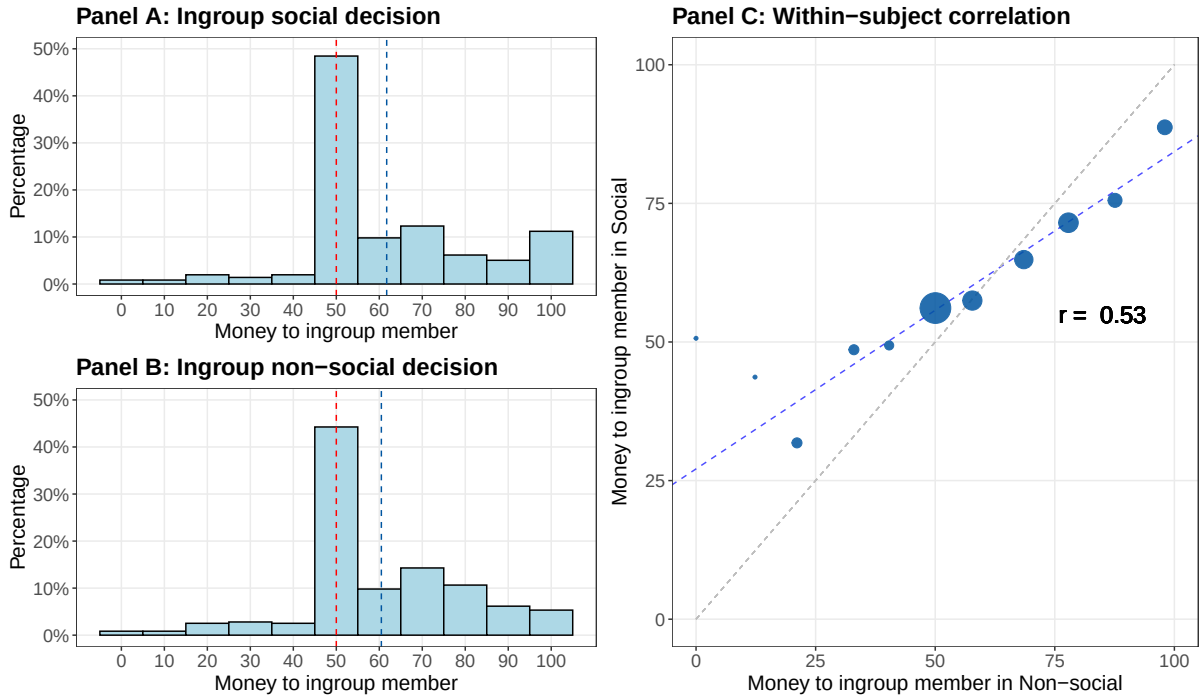
Data. For all experiments, we used Prolific to recruit online participants living in the US. We choose Prolific due to its status as one of the leading market research companies used in social science research and because their participants have been shown to provide high-quality responses in terms of comprehension and attention (Eyal et al., 2021; Gupta, Rigotti, and Wilson, 2021). All experiments were preregistered, see Appendix F for details. We used oTree (Chen, Schonger, and Wickens, 2016) for programming the graphical user interface. Subjects spent a median of 10 to 12 minutes in the experiments and received as compensation the equivalent of an hourly wage between \$10 and \$12 per hour. In each experiment, one randomly selected subject had one randomly selected decision implemented with real consequences.

3.2 Results

***Ingroup social* decisions.** In the *ingroup social* decisions, subjects allocate on average \$57.58, \$67.81, and \$59.88 to the ingroup member when they share the same interests/hobbies, the same political views, or the same religious beliefs, respectively. In all three cases, we can reject the hypothesis of no ingroup-favoritism ($p < 0.001$, Wilcoxon tests). Figure 1 panel A displays the distribution pooled over the three decisions, which replicates the typical distributional pattern found in the literature (e.g., Enke, Rodríguez-Padilla, and Zimmermann, 2022). In 52% of the decisions, subjects display ingroup-favoritism by allocating strictly more than 50% to the ingroup. Outgroup-favoritism is found in 9% of decisions, and in the remaining 39%, subjects allocate 50/50. In total, 76% of subjects display ingroup-favoritism in at least one decision, making it the prevalent mode of decision-making.

***Ingroup non-social* decisions.** Importantly, a similar pattern emerges in the *Ingroup non-social* decisions. Here, subjects allocate on average \$58.47, \$64.00, and \$58.97 when splitting in favor of ingroup members sharing the same interests/hobbies, same political views, and same religious beliefs. As before, we find significant ingroup-favoritism in all three cases ($p < 0.001$, Wilcoxon tests), even though the decisions feature no transfers to in- or outgroup members. See Figure 1 panel B for the distribution of the pooled decisions. In 55% of the *Ingroup non-social* decisions, subjects display ingroup-favoritism by allocating strictly more than 50% to the ingroup. Outgroup-favoritism is found in 12% of decisions, and in the remaining 32%, subjects allocate 50/50.

Figure 1: Main results ingroup versus outgroup decisions



Notes: **Panel A and B:** Histogram of *Ingroup social* (Panel A) and *Ingroup non-social* (Panel B) decisions. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to the ingroup member instead of the outgroup member. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Ingroup social* (Panel A), the decisions have consequences for the ingroup and outgroup members. In *Ingroup non-social* (Panel B), the decisions have consequences only for the subjects, with their payoff depending on the ingroup and outgroup member's WTP for the gift card. **Panel C:** Binned scatter plot of *Ingroup social* and *Ingroup non-social* decisions. The blue dotted line displays the linear fit of a regression of the *Ingroup social* on *Ingroup non-social* decisions. The correlation coefficient is $r = 0.53$. For all three panels, the binwidth is 10. Decisions are pooled across the three groups (shared hobbies/interests, political views, and religious beliefs), displaying $n = 357$ decision-pairs by 119 subjects.

Comparing *Ingroup social* and *non-social*. The two sets of decisions show remarkable similarity. We cannot reject the equality of average ingroup allocations between *Ingroup social* and *non-social* decisions in any of the three cases ($p = 0.38$ for hobbies/interests, $p = 0.23$ for political views, $p = 0.98$ for religious beliefs, Wilcoxon tests). Further, we cannot reject that the distributions of allocations are equal ($p = 0.30$ for hobbies/interests, $p = 0.23$ for political views, $p = 0.99$ for religious beliefs, Kolmogorov-Smirnov test). The same holds true when decisions are pooled across the three domains for additional statistical power ($p = 0.40$, Kolmogorov-Smirnov test). Thus, our non-social setup where decisions have no consequences for either group member closely replicates ingroup versus outgroup attitudes from the standard social setup.

Next, we turn to the within-subject comparisons. For the median subject, we find no difference in behavior on the individual level, meaning that the median subject makes the same choice in *Ingroup non-social* and *Ingroup social*. Figure 1 panel C displays the distribution of each individual social and non-social decision pair in a binscatter-plot. As the figure shows, the two decisions are highly correlated on the individual level, with a correlation

coefficient of $r = 0.53$. That is, displaying a higher degree of in-group favoritism in *Ingroup non-social* predicts in-group favoritism in *Ingroup social*.

Result 1. *We find ingroup-favoritism in Ingroup non-social, which retains interpersonal uncertainty but removes any consequences for ingroup or outgroup members. The distribution of behavior is similar to Ingroup social, which features consequences, and decisions in the two situations are strongly correlated on the individual level.*

3.3 Relating interpersonal uncertainty to ingroup-favoritism

Elicitation. To directly elicit interpersonal uncertainty, we ask decision-makers after the *Ingroup social* decisions the following question, separately for the ingroup and outgroup member:

> "How certain are you about how much the individual (. . .) would value Amazon gift card money?"

Subjects could respond on a 11-point Likert scale from *Very uncertain* to *Very certain*. For the analysis, we re-code the variable so that higher values indicate higher uncertainty. We then create a relative uncertainty measure by subtract the uncertainty subject report over the ingroup member's utility from the uncertainty reported over the outgroup member's utility.

Results. We find that subjects indeed perceive higher outgroup uncertainty: they report on average 0.57 Likert scale points higher uncertainty for the outgroup member that does not share their hobbies/interests, 1.01 for political views and 0.45 for religious beliefs, all significantly different from the no difference benchmark ($p < 0.05$, Wilcoxon tests). Pooling over the three groups, in 31% of cases subjects report higher uncertainty for the outgroup, in 12% they report higher uncertainty for the ingroup and in the remaining 58% cases subjects report no difference. Importantly, differences in uncertainty predicts choice behavior: higher relative uncertainty for the outgroup is associated with stronger in-group favoritism in *Ingroup social* ($r = 0.30$, $p < 0.001$) and *Ingroup non-social* ($r = 0.17$, $p = 0.002$).

3.4 Robustness

Our main results confirm a high degree of similarity between the *Ingroup social* and *Ingroup non-social* decisions. Next, we present a series of additional treatments that further establish the connection between interpersonal uncertainty and ingroup favoritism.

3.4.1 Beliefs about WTP drive social decisions

Do subjects really care about the recipients WTP when they make social allocation decisions? To provide direct evidence, in our first two robustness treatments, we provide subjects direct information about the relative magnitudes of WTP_{in} and WTP_{out}.

Design. In two treatments *Ingroup info* and *Outgroup info*, implemented within-subject in random order, we inform subjects that WTP_{in} is larger than WTP_{out} and vice-versa. Specifically, in *Ingroup info*, we inform subjects that they have been matched with recipients where the ingroup member has a 20-30% higher WTP than the outgroup member. Similarly, in *Outgroup info*, we inform them that their matched outgroup member has a 20-30% higher WTP. Subjects face both *Ingroup info* and *Outgroup info* treatments in random order, and face as part of the treatments in each after receiving the information the *Ingroup social* decisions. Overall, 122 subjects participated in this robustness experiment.

Results. We find that being informed about the relative magnitudes of recipients' WTP indeed changes allocation behavior in the social decisions. Subjects allocate on average \$58.11 to the ingroup member when given the information that the outgroup member's WTP is higher, whereas they allocate \$64.20 to the ingroup member when the information is that the ingroup member's WTP is higher. The effect of the information is significant on the 1% level and 5% level respectively when analyzing the information effect within-subject and between subjects, see Table B.1 in the appendix.

3.4.2 Subjects understand and react to Utilitarian incentives

Whereas we designed the experiment and instructions to minimize room for limited attention or confusion, could it still be the case that subjects do not understand or do not pay attention to the induced utilitarian incentives we induce in *Ingroup non-social*? A potential confound is that if subjects are confused or do not pay attention to the incentives, they may treat the *non-social* decisions as *social* decisions.

Design. To test for this confound, we designed the *Ingroup incentive* and *Outgroup incentive* treatments. In these treatments, we vary the Utilitarian incentives by changing the weights that are put on the ingroup and outgroup members' WTPs, leaving all other aspects of the *Ingroup non-social* decisions unchanged. In *Ingroup incentive*, the weight on the ingroup member's WTP is three times as high as the outgroup member's WTP. A subject's payoff thus becomes:

$$\Pi\left(x_{in}, x_{out}\right) = 3 \cdot x_{in} \cdot WTP_{in} + x_{out} \cdot WTP_{out}$$

Similarly, in *Outgroup incentive* we increase the weight on the outgroup member's WTP to be three times as high as the ingroup member's WTP:

$$\Pi\left(x_{in}, x_{out}\right) = x_{in} \cdot WTP_{in} + 3 \cdot x_{out} \cdot WTP_{out}$$

If subjects respond to the incentives we induce in the *non-social* decisions, ingroup favoritism should increase in *Ingroup incentive* and decrease in *Outgroup incentive*. In total,

120 subjects participated in this robustness experiment, facing both treatments in random order.

Results. We indeed find that subjects respond to changes in the induced Utilitarian incentives. Compared to the baseline *Ingroup non-social* results from section 3.2, *Ingroup incentive* increases average ingroup allocations increase from \$58.47 to \$67.22 for hobbies/interests ($p < 0.001$, Wilcoxon tests), from \$64.00 to \$72.57 for political views ($p < 0.001$), and from \$58.97 to \$65.22 for religious beliefs ($p = 0.01$). Conversely, *outgroup incentive* decreases allocations to the ingroup to \$37.76 for hobbies/interests, to \$46.89 for politics and to \$42.21 for religious beliefs (all three $p < 0.001$). Importantly, in *outgroup incentive*, subjects display outgroup favoritism. The pooled average is \$42.29, which is significantly smaller than the even split ($p < 0.001$, Wilcoxon test). See Appendix Figure C.1 for the distributions. We obtain similar results from the between-subject comparison, see Appendix Section D.3.

These results, in particular the finding of outgroup favoritism in *outgroup incentive* provides strong evidence against limited attention or confusion because simply changing a single number in the incentive formula completely reverses the direction of favoritism from ingroup to outgroup favoritism.

3.4.3 Inducing Rawlsian preferences changes behavior

The previous treatments show that Utilitarian preferences facing interpersonal uncertainty can explain ingroup favoritism. Further, varying the Utilitarian incentives changes the degree and direction of group favoritism in the *non-social* decisions. But would inducing any class of preferences lead to replicating the social decisions in a non-social setting or is Utilitarianism special in this regard? Suppose we induce Rawlsian preferences, one of the most important alternatives to Utilitarianism. Would subjects still choose identically to the Utilitarian case, showing ingroup favoritism as before? Or would their choices adapt to the new incentives? To answer these questions, we designed the *Non-social minimum*, which induces Rawlsian preferences.

Design. In the treatment *Non-social minimum*, subjects face *non-social* decisions, but instead of incentivizing a Utilitarian preference, we incentivize them to implement a Rawlsian or MaxMin welfare function. Specifically, a subject's payoff is calculated as:

$$\Pi\left(x_{in}, x_{out}\right) = \min\{x_{in} \cdot WTP_{in}, x_{out} \cdot WTP_{out}\}$$

Thus, we incentive them to choose the allocation that maximizes the utility of the worse-off individual, irrespective of group affiliation. All other aspects of the decisions are identical to the *Ingroup non-social* decisions. In total, 62 subjects participated in the *Non-social minimum* treatment.

The *Non-social minimum* treatment also helps us test the following confounding channel:

> Subjects are inattentive to the incentives in *Ingroup non-social* and hence mechanically replicate their social choices. They only become attentive once the differential incentives induced in *Ingroup incentive* and *Outgroup incentive* introduce a payoff-asymmetry.

This form of selective limited attention could in principle explain the similarity between *social* and *non-social* decisions as well as the response to the incentive treatments. The *Non-social minimum* treatment puts this to the test, because the Rawlsian payoff rule treats in- and outgroup symmetrically, yet incentivizes a different allocation than the Utilitarian payoff rule. To see this, suppose that the WTP-distribution for the outgroup is a mean-preserving spread of the ingroup's WTP distribution. As we show in Section 2, under risk-aversion, Utilitarian preferences are maximized at $100 > x_{in} > 50$, implying ingroup favoritism, while Rawlsian preferences are maximized at $x_{in} = x_{out} = 50$, implying no favoritism in either direction.

Importantly, we kept the decision screen identical to that in *Ingroup non-social*, only the induced incentives changed. Because the incentive is explained prior to the decision screen, any inattention or confusion would lead subjects to choose similarly to what they choose in the *Ingroup non-social* decisions. In particular, if subjects are inattentive to the incentives we induce in the *non-social* decisions and thus erroneously think they face the *Ingroup social* choice instead, we should observe ingroup favoritism. In contrast, if they are attentive and understand the incentive, there should be no favoritism, neither in the direction of the ingroup nor in the direction of the outgroup.

Results. As predicted, we find that ingroup favoritism is eliminated under the Rawlsian incentive. On average, subjects allocate \$51.31 to the individual sharing interests/hobbies, \$52.85 to the individual sharing political views and \$49.77 to the individual sharing religious beliefs. In all three cases, we can no longer reject that the average is different from the 50/50 split ($p = 0.31$, $p = 0.13$ and $p = 0.95$ respectively, Wilcoxon tests). In particular, under the MaxMin incentive subjects allocate significantly less to their in-group member compared to *Ingroup non-social* (in all three cases $p < 0.01$, Wilcoxon tests). For the distribution of decisions, see Appendix Figure C.2. In general, the observed behavior indicates that subjects responds strongly to the induced incentives in the expected direction. The percentage of choices that implement exactly a 50/50 split increases from 32% in *ingroup non-social* to 58% *Ingroup non-social minimum*, and a further fraction of 22% subjects is within \$10 of the even split. Similarly, the percentage of highly unequal allocations, as measured by giving less than \$30 or more than \$70 to the ingroup member, drops from 32% to 12%.

3.4.4 Analyzing order effects

Another concern for the validity of our results is contagion across conditions induced by our within-subject design. After seeing first the *social* decisions, subjects may adjust their choice

in the subsequent *non-social* decisions to mimic the *social* decisions. Such adjustment would lead to an artificially high similarity between the two decisions. Because we randomized the order of decisions, we can directly assess this concern by (i) testing for order effects and (ii) analyzing only the first block of decisions that each subject makes, which provides a between-subject comparison.

Testing for order effects, we find no evidence that the order influences subjects' behavior. For the *Ingroup non-social* decisions, the pooled average allocations to the ingroup are \$60.89 when elicited before, and \$60.10 when elicited after the *social* decisions. Neither the averages nor the distributions are significantly different from each other.[18] For the *Ingroup social* decisions, average allocations are \$63.38 when *Ingroup social* is elicited first, and \$59.92 when elicited after the *non-social* decisions. Again, averages and distributions generally do not differ significantly.[19]

Given the absence of order effects, it is not surprising that we replicate our within-subject results in the between-subject comparison. For instance, we find strong ingroup favoritism in *Ingroup non-social*, which is again not statistically different from the ingroup favoritism we find in the *Ingroup social* decisions. See Appendix Section D.1 for details.

In sum, our additional treatments and analyses support the notion that behavior in the *Ingroup non-social* is the result of conscious and deliberate decision-making, not of inattention or confusion. The absence of order effects and our replication of the within-subject effect in a between-subject comparison further support the notion that the similarity between the *social* and *non-social* decisions is not an artifact of our experimental design.

4 Self versus other paradigm (Dictator game)

Our experimental design we use to study ingroup favoritism naturally extends to tradeoffs involving one's own utility versus the utility of others (self versus other decisions), as does the idea that interpersonal uncertainty shapes behavior in these tradeoffs.

4.1 Design

Similar to the ingroup versus outgroup case, decision-makers face a *Self social* and a *Self non-social* decision, in randomized order. Right before the *Self non-social* decision, they also

[18] For hobbies/interests *Ingroup non-social* the averages are \$56.86 and \$59.95 ($p = 0.58$, Wilcoxon test), for political views \$65.02 and \$63.06 ($p = 0.61$, Wilcoxon test), and for religious beliefs \$60.81 and \$57.29 ($p = 0.15$, Wilcoxon test). We also cannot reject the null that distributions are invariant to the order ($p = 0.61, p = 0.31, p = 0.22$, Kolmogorov-Smirnov tests)

[19] For hobbies/interests *Ingroup social* the averages are \$57.48 and \$57.47 ($p = 0.54$, Wilcoxon test), for political views \$71.05 and \$64.28 ($p = 0.26$, Wilcoxon test), and for religious beliefs \$61.61 and \$58.00 ($p = 0.99$, Wilcoxon test). We also cannot reject the null that distributions are invariant to the order for hobbies/interests and religious beliefs ($p = 0.27$ and $p = 0.32$, Kolmogorov-Smirnov tests), with the only exception being political views ($p = 0.01$).

complete the valuation task for $100 Amazon gift card money received 6 weeks later.

***Self social* decision.** For the *Self social* decision, we endow decision-makers with $100 which they can allocate between themselves and another individual they have been matched with (without any information about group affiliations). The allocated money is paid out to both parties in the form of Amazon gift card money, six weeks from the date of the experiment. Hence, the *Self social* decision is the standard dictator game: it has consequences for the DM as well as the other individual.

***Self non-social* decision.** In the *Self non-social* decisions, decision-makers split $100 between themselves and another individual, and we again remove any social consequences. That is, neither the DM, nor the matched participant receive the money that is split. Instead, only the DM receives a reward based on the following formula:

$$\Pi\left(x_{self}, x_{other}\right) = x_{self} \cdot WTP_{self} + x_{other} \cdot WTP_{other},$$

where x_{self} denotes the amount DMs allocate to themselves, x_{other} the amount allocated to the matched individual, and WTP_{self} and WTP_{other} their respective WTP for the gift card (divided by 100). Decision-makers are thus incentivized to maximize the sum of their WTP and the WTP of the other individual they are matched with, with both WTPs receiving equal weight. All other elements match the ingroup versus outgroup setting. In total, 120 subjects faced the *Self social* and *Self non-social* decisions.

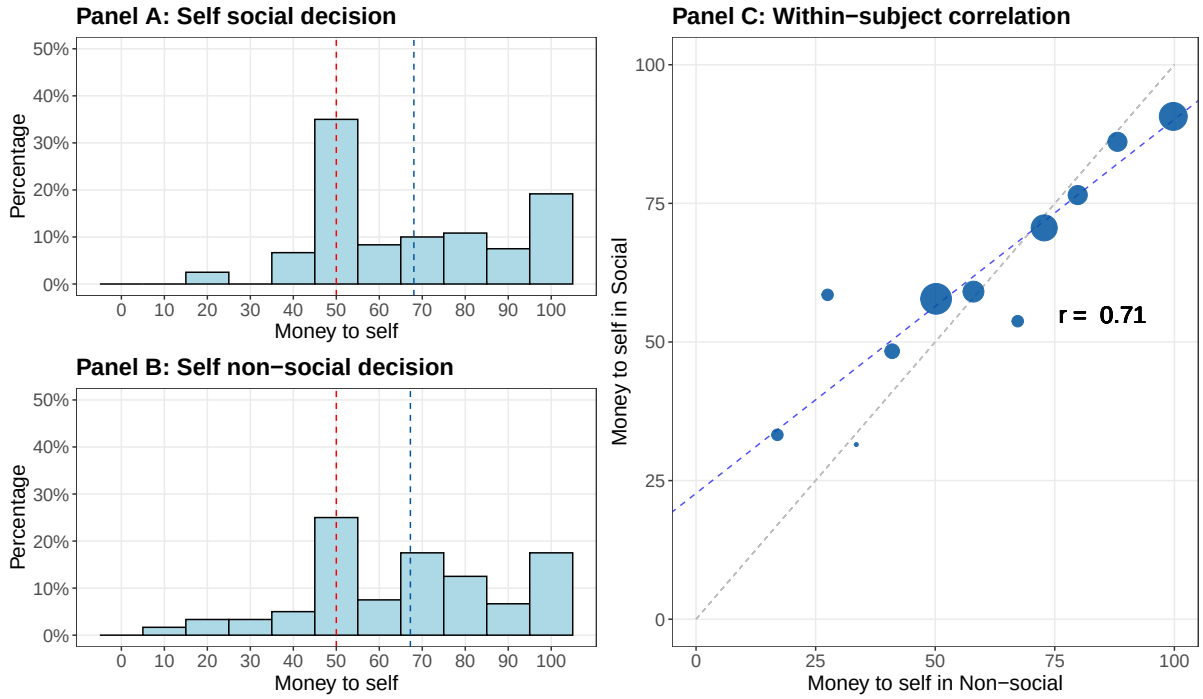
4.2 Results

***Self social* decision.** In the *Self social* decision, subjects allocate on average $68.05 to themselves, thereby allocating significantly more money to themselves compared to the equal split ($p < 0.001$, Wilcoxon test). Figure 2 panel A displays the distribution, which replicates the typical distributional pattern of dictator games found in the literature (e.g., Engel, 2011). In total, 62% of subjects allocate more money to themselves, 9% allocate more to the other person, and 29% implement the 50/50 split.

***Self non-social* decision.** In *Self non-social*, subjects allocate on average $67.02 to themselves, again a significant deviation from the equal split ($p < 0.001$, Wilcoxon test). As Figure 2 panel B shows, the distribution is also similarly shaped as in the *Self social* case. In total, 66% of subjects allocate more money to themselves, 13% allocate more to the other person, and 21% implement the 50/50 split.

Comparing *Self social* and *non-social*. Allocations in the *Self non-social* setting closely replicates the behavior we observe in *Self social*. That is, we cannot reject that the average

Figure 2: Main results self versus other decision



Notes: **Panel A and B:** Histogram of the *Self social* (Panel A) and *Self non-social* (Panel B) decision. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to themselves instead of another individual. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Self social* (Panel A), the decision has consequences for the subjects and the matched other individuals. In *Self non-social* (Panel B), the decision has consequences only for the subjects, with their payoff depending on their and the other individual's WTP for the gift card. **Panel C:** Binned scatter plot of *Self social* and *Self non-social* decisions. The blue dotted line displays the linear fit of a regression of the *Self social* on the *Self non-social* decision. The correlation coefficient is $r = 0.71$. For all three panels, the binwidth is 10. Displayed are $n = 120$ decision-pairs by 120 subjects.

amount that subjects allocate to themselves is equal between the *social* and *non-social* decision ($p = 0.97$, Wilcoxon test). Similarly, we cannot reject that the distribution of allocations is equal between the two decisions ($p = 0.95$, Kolmogorov-Smirnov test).

These results transfer to the within-subject comparison. For the median subject, we find no difference in behavior on the individual level, meaning that the median subject makes the same choice in *Self non-social* and *Self social*. Figure 2 panel C displays the distribution of each individual social and non-social decision pair in a binscatter-plot. The two decisions are highly correlated on the individual level, with a correlation coefficient of $r = 0.71$.

Result 2. *We replicate self-regarding behavior found in Self social also in Self non-social. The distribution of behavior is similar and strongly correlated on the individual level.*

4.3 Relating interpersonal uncertainty to dictator game giving

We again elicited self-reported interpersonal uncertainty after the *Self social* decision, both over subjects' own utility and their perception of the other individual's utility. Subjects report

on average 2.59 Likert-scale points higher uncertainty for the other person's utility than their own, which is again significantly different from the no difference benchmark ($p < 0.001$, Wilcoxon tests).[20] In total, 72% of subjects report a higher uncertainty about the other person's utility, 6% report a higher uncertainty about their own utility, and for 23% the two ratings are equal. Importantly, the difference in ratings again predicts choice behavior. Higher uncertainty ratings of the other individual are associated with subjects allocating more money to themselves, e.g., displaying less other-regarding behavior in the *Self social* $(r = 0.35, p < 0.001)$ and *Self non-social* decision $(r = 0.24, p < 0.01)$.

4.4 Robustness

The design of the *Self non-social* decision allows us to conduct an additional test of subject comprehension and attentiveness. In contrast to the ingroup case, subjects' own WTP directly enters the payoff function in the *Self non-social* decision. Because for a given degree of uncertainty, the higher subjects' own perceived WTP, the higher the expected marginal return from allocating more money to themselves. We test this prediction in Table 1 where we regress the allocation to self on the difference in interpersonal uncertainty and subjects own WTP as independent variables. In columns (1) and (2), the dependent variables of the corresponding regressions are the *Ingroup non-social* and *Ingroup social* decisions, whereas in columns (3) and (4) it is the *Self non-social* and *Self social* decision. We find, as hypothesized, that a subject's own WTP does not predict allocations in the ingroup versus outgroup case, but significantly increases allocations in *Self non-social*. In contrast, differences in our interpersonal uncertainty significantly predict allocations in every instance.

We also conducted further robustness treatments that replicate the incentive and information treatments from the ingroup versus outgroup setting (Section 3.4). Our results mirror those from the previous section: subjects understand the incentives and react to them as hypothesized. We discuss the results of these additional treatments in Appendix Section E.

5 Giving versus taking paradigm

Next, we turn to studying fairness attitudes. The primary observation of the literature on fairness attitudes is the existence of a merit-based fairness behavior: people redistribute less from initial endowments if these endowments are earned compared to generated by chance (Cappelen, Falch, and Tungodden, 2020). In particular, in the context of dictator games, several studies show that subjects allocate more money to themselves (the other person) if

[20] As expected, subjects report low degrees of uncertainty over their own utility for the future gift card money, with a median report of 1 on the 0 to 10 Likert-scale. See Chakraborty (2021) and Gabaix and Laibson (2022) for models where decision-makers have uncertainty over their own future utility. Also, the difference in interpersonal uncertainty between self and others is much higher than that between ingroup and outgroup.

Table 1: The relationship between interpersonal uncertainty and behavior in ingroup versus outgroup and self versus other decisions

	Dependent variable:			
	Allocation to ingroup member		Allocation to self	
	Non-social decision	*Social decision*	*Non-social decision*	*Social decision*
	(1)	(2)	(3)	(4)
Δ Interpersonal uncertainty	1.423**	2.656***	1.779**	2.521***
	(0.633)	(0.659)	(0.694)	(0.615)
Own WTP	−0.119	−0.130	0.560**	0.238
	(0.130)	(0.124)	(0.219)	(0.200)
Constant	69.680***	71.015***	14.036	40.864**
	(11.702)	(10.990)	(18.155)	(17.029)
Subjects	119	119	120	120
Observations	357	357	120	120
R^2	0.032	0.092	0.108	0.131

Notes: The table shows OLS estimates. The dependent variable in columns (1) and (2) is the amount subjects allocate to the ingroup member (out of $100) in the *Ingroup non-social* decision in (1) and in the *Ingroup social* decisions in (2). In columns (2) and (3), the dependent variable is the amount subjects allocate to themselves (out of $100) in the *Self non-social* decision in (1) and in the *Self social* decisions in (2). "Δ Interpersonal uncertainty" is defined as the difference in uncertainty about the utility of outgroup and ingroup members in (1) and (2) and the utility of the other person and themselves in (3) and (4). Higher values indicate higher uncertainty about the outgroup member in (1) and (2) and the other person in (3) and (4). "Own WTP" is defined as subject's willingness-to-pay for a $100 gift card. Standard errors (in parentheses) are clustered at the subject level. Significance levels: *p<0.1, **p<0.05 and ***p<0.01.

they (the other person, respectively) earned the money to be allocated instead of receiving it as windfall (Ruffle, 1998; Cherry, 2001; Cherry, Frykblom, and Shogren, 2002; Cherry and Shogren, 2008; Oxoby and Spraggon, 2008; Krupka and Weber, 2013).

This behavior is typically attributed to people's fairness preferences (e.g., Tungodden and Cappelen, 2019), fairness-based social norms (Krupka and Weber, 2013), or the role of property rights (Oxoby and Spraggon, 2008). Based on our framework, we offer an alternative explanation: if people perceive that losing earned money causes a larger disutility than gaining money creates utility (i.e, a gain-loss asymmetry), then a simple utilitarian motive under uncertainty would also lead to the same asymmetry between giving and taking environments (see result (iii) of Theorem 1 for the formal result). Our next treatments test this channel.

5.1 Design

We alter the *giving environment* in the dictator game from the previous section to create a *taking environment*. DMs face a *Taking social* decision and a *Taking non-social* decision. In both *Taking* decisions, DMs are matched to a previous participant who has earned $100 for participating in a previous study, scheduled to be paid in 6 weeks from the current day. In total, 123 subjects participated in this experiment.

***Taking social* decision.** In the *social* variant, the DM decides whether to take some or all of the money the other participant has earned for themselves, adapting the design of Oxoby and Spraggon (2008). The chosen allocation is then implemented with consequences for the DM and the other participant.

***Taking non-social* decision.** In the *non-social* variant, we replicate the setup described in section 3 with one key difference: because the other participant already earned the $100 that was up for splitting, the DM's utilitarian incentives were calculated using the other participant's willingness-to-accept (WTA) for gift card money, instead of their WTP. Thus the DM's payment depended on their own WTP and the matched participant's WTA. Specifically, the incentive for the DM is as follows:

$$\Pi\left(x_{self}, x_{other}\right) = x_{self} \cdot WTP_{self} + x_{other} \cdot WTA_{other},$$

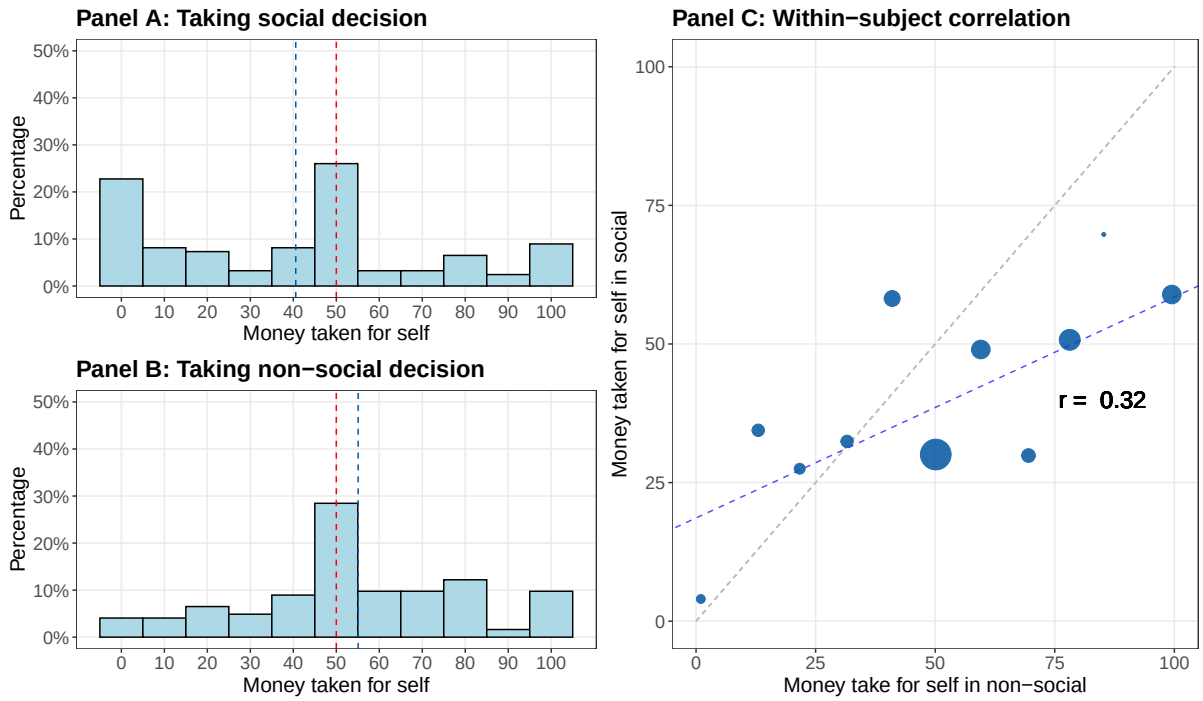
with x_{self} and x_{other} denoting the money DMs allocate to themselves and the other individual respectively, WTP_{self} is their own WTP and WTA_{other} is the other individual's WTA for the gift card money.

We explained to every DM in the dictator game how the WTA was elicited for their matched participant: First, we endowed the matched participant with a $100 gift card that they earned through their participation, and that would pay in 6 weeks. Then, we asked them whether they would be willing to give away the gift card in exchange for an immediately payable monetary amount. We ask this question for different amounts of the immediately payable money, using an MPL. DMs are familiar with this elicitation method at this point because they have already participated in the MPL that elicits their WTP. We emphasize to subjects that the only difference in the WTP elicitation is, instead of having the option to receive the gift card, matched participants already 'own' the gift card and have the opportunity to sell it.

Multiple studies have found that WTA is on average higher than WTP (see Camerer, 1995; DellaVigna, 2009, for overviews), and hence WTA>WTP is a well-established empirical pattern. Our central hypothesis is that, if DMs also anticipate the WTA-WTP gap, then utilitarianism would provide a novel foundation for differences in giving and taking. In particular, under WTA>WTP, we predict that the amount allocated to the matched participant should increase (compared to the giving paradigm) not only in *Taking social*, but also in *Taking non-social*. Further, because *Taking non-social* does not feature any scope for fairness attitudes, such an increase would disentangle our channel from a fairness channel.

A necessary condition for these predictions is that subjects indeed perceive a positive difference in the utility impact of taking earned money and giving windfall money, i.e., in other's WTA and WTP. To validate this assumption, we asked subjects whether they generally think that a person's WTA for the gift card is higher, lower or equal to the WTP. In total, 46% of subjects believe WTA to be higher than WTP, 29% believe WTP to be higher, and 24%

Figure 3: Giving versus taking results



Notes: **Panel A and B:** Histogram of the *Taking social* (Panel A) and *Taking non-social* (Panel B) decision. The x-axis denotes the amount of gift card money (out of \$100) that subjects allocate to themselves instead of another individual. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Taking social* (Panel A), the other individual has earned the \$100 and subjects decide how much to take away for themselves. Their decision has consequences for themselves and the other individual. In *Taking non-social* (Panel B), the decision has consequences only for the subjects, with their payoff depending on their WTP and the other individual's WTA for the gift card. **Panel C:** Binned scatter plot of the *Taking social* and *Taking non-social* decision. The blue dotted line displays the linear fit of a regression of the *Taking social* on the *Taking non-social* decision. The correlation coefficient is $r = 0.32$. For all three panels, the binwidth is 10. Displayed are $n = 123$ decision-pairs by 123 subjects.

believe both to be equal. Thus, subjects believe WTA>WTP on average.

5.2 Results

***Taking social* decision.** Comparing *Taking social* with *Self social*, we see a strong effect of changing the setting from windfall to earned money. Compared to the \$68.05 that subjects allocate to themselves in *Self social*, subjects in *Taking social* allocate (take) only \$40.57 to themselves, a significant decrease ($p < 0.001$, Wilcoxon test). In total, 26% allocate more money to themselves, 51% allocate more to the other person, with the remaining 23% allocating the even split, see Panel A of Figure 3 for the distribution. Thus, changing the source of the endowment changes the median (and mean) behavior from own to other-regarding behavior.

***Taking non-social* decision.** We also find that own-allocations decrease in the *non-social* decision. Whereas subjects allocate on average \$67.02 to themselves in *Self non-social*, subjects allocate \$55.08 to themselves in *Taking non-social*, a significant decrease ($p < 0.001$,

Wilcoxon tests). In total, 46% allocate more money to themselves, 29% allocate more to the other person, and 24% split evenly, see Panel B of Figure 3 for the distribution. Therefore, exchanging in the incentive function the other individuals' WTP with the WTA leads to subjects allocating significantly less money to themselves.

Comparing *Taking social* and *Taking non-social*. As in the other settings, we again see a significant within-subject correlation between taking behavior in the two situations of $r = 0.32$ ($p < 0.001$), see Panel C of Figure 3. Thus, taking behavior in the *social* decision is correlated with a decision that does not feature taking (not even in wording). However, contrary to the other settings, average allocations are significantly different from each other ($p < 0.001$, Wilcoxon test), as are distributions ($p < 0.01$, Kolmogorov-Smirnov test). This suggests that another motive is also at work driving the social behavior.

A potential motive comes from the observation that a striking 22% of subjects choose to take \$0 for themselves in *Taking social*, while only 3% do so in *Taking non-social*. In contrast, in *Self social* and *Self non-social*, not a single subject chooses to give everything to the other individual. This pattern suggests that fairness preferences are also at work, e.g., through some people adhering to a deontological motive that, independent of consequences, it is not permissible to take money from someone (Bénabou, Falk, and Henkel, 2022). Interestingly, those subjects refusing to take any money completely explain the gap between *Taking social* and *Taking non-social*. If we focus only on subjects who take more than \$0 for themselves in *Taking social*, we can no longer reject the equality of average giving between *Taking social* and *Taking non-social* ($p = 0.22$, Wilcoxon test)[21] and distributions become more similar ($p = 0.09$, Kolmogorov-Smirnov test), see Appendix Figure C.3. Similarly, the within-subject correlation increases to $r = 0.45$.

Result 3. *Subjects allocate more money to the other person when the other person earned the money (Taking social) compared to when it is given as a windfall (Self social). We document a similar behavior when comparing Self non-social with Taking non-social, where for the non-social incentive instead of the other person's WTP their WTA is used.*

6 Avoiding the ask paradigm

Our last application studies "avoiding the ask" behavior, which describes people's tendency to avoid situations that feature a self versus other tradeoff. For instance, when given a choice between earning x versus earning money by participating in a dictator game with a starting endowment of $y > x$, a significant fraction of subjects prefer the former over the latter (Lazear, Malmendier, and Weber, 2012). Similarly, people choose to avoid scheduled visits by door-to-door fund-raisers (DellaVigna, List, and Malmendier, 2012), choose a different

[21] Note that this effect is not mechanical because both *social* and *non-social* decisions are removed due to the within-subject structure of our data.

route of exit at a supermarket to avoid encountering verbal solicitation by fundraisers at the other exit (Andreoni, Rao, and Trachtman, 2017), and buy tickets through other means if buying online entails being asked for a donation (Adena and Huck, 2020).

A natural explanation for this avoiding behavior is that people anticipate and want to avoid the emotional response or social pressure that the "ask" imposes on them (perhaps through self- and social-image concerns). Our framework provides another explanation:

> *Subjects want to avoid dealing with the cognitive cost of interpersonal utility comparisons that are inherent in these giving decisions.*

To test this hypothesis, we design and implement the treatments *Avoid social* and *Avoid non-social* with 123 participants. Both allow subjects to avoid facing a dictator game, but the latter also removes any social consequences of the dictator game while preserving interpersonal uncertainty.

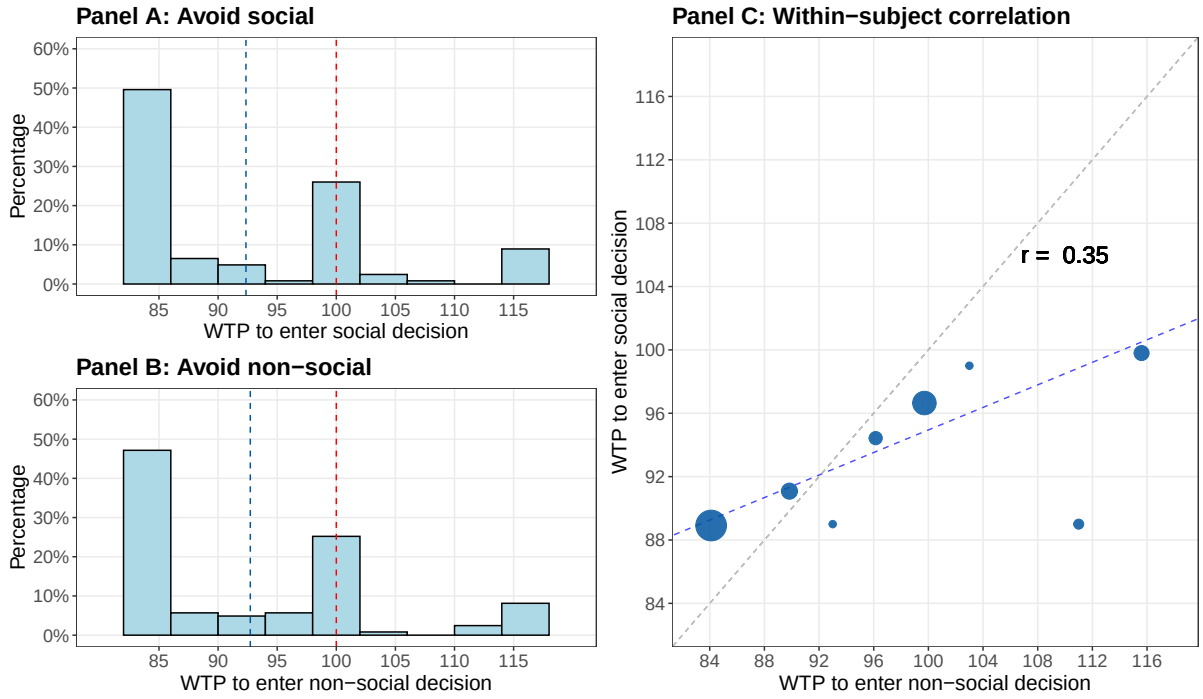
6.1 Design

Avoid social. Our *Avoid social* treatment builds on the design of Lazear, Malmendier, and Weber (2012). It features a game identical to *Self social* but adds an additional stage beforehand in which subjects are given the option to avoid entering the *Self social* game appended to it. Specifically, in *Avoid social*, DMs choose between two options, A and B. Choosing Option A means entering the *Self social* game, where they are then asked to distribute \$100 between themselves and another randomly matched individual (the standard *Self social* game). Choosing Option B means not entering the game and instead receiving a fixed amount of money for themselves. In both cases, the money is paid as gift card money in six weeks.

We use an MPL to elicit the DM's willingness to enter the dictator game by varying the amount of money that subjects receive when choosing Option B. The amount of money offered under B increases from \$84 to \$116 in \$2 increments. If subjects choose Option B over A for values below \$100, it means that they are willing to pay a premium to *avoid* distributing money in the dictator game. Conversely, if subjects choose Option A over B for values above \$100, it means they are willing to pay a premium for the opportunity to distribute money.

Avoid non-social. Here, subjects also face an MPL at the entry point, but instead of eliciting their willingness to avoid the *Self social* game, we elicit their willingness to avoid the *Self non-social* game. That is, choosing Option A leads to subjects deciding in the *Self non-social* game, that is, splitting \$100 to maximize the sum of gift card WTPs of themselves and another individual. Choosing Option B means that instead of entering the *Self non-social* game, subjects receive a fixed amount of gift card money paid in six weeks that is varied

Figure 4: Avoiding the ask results



Notes: **Panel A:** Histogram of the *Avoid social* decision. The x-axis denotes the subject's willingness-to-pay to avoid participating in the *Self social* decision. **Panel B:** Histogram of the *Avoid non-social* decision. The x-axis denotes the subject's willingness-to-pay to avoid participating in the *Self non-social* decision. In both cases does the red dotted line denotes the even split benchmark, the blue dotted line the average willingness-to-pay to avoid the decision. **Panel C:** Binned scatter plot of the *Avoid social* and *Avoid non-social* decision. The blue dotted line displays the linear fit of a regression of the *Avoid social* on the *Avoid non-social* decision. The correlation coefficient is $r = 0.35$. For all three panels, the binwidth is 10. Excluded are subjects that take nothing from the other individual in *Taking social*. Thus, displayed are $n = 123$ decision-pairs by 123 subjects.

between the rows of the MPL.[22]

In this setting, choosing Option B for values below \$100 indicates an aversion to entering the *Self non-social* game. This is because by entering the game, subjects could allocate the full \$100 to themselves, and then get paid 100% of their WTP for the gift card with certainty on the same day. Under the assumption that the MPL elicitation reveals subjects' true WTP for the \$100 gift card, allocating \$100 to themselves in *Self non-social* is equivalent in utility terms to receiving a \$100 gift card money in six weeks. Choosing B for values lower than \$100 thus leads to strictly lower utility.[23]

[22]Additionally, we instructed subjects in both *Avoid social* and *Avoid non-social* that when choosing Option A, they had to stay at least 25 seconds on the decision page, while when choosing Option B, they had to wait at least 25 seconds on a separate page before continuing with the experiment. This ensured that subjects did not choose to avoid the decision merely to finish the experiment faster.

[23]To see this, note that their gift card WTP used in *Self non-social* is precisely their WTP for receiving \$100 on gift card money paid in six weeks – the object they get by choosing Option B at a price of \$100.

6.2 Results

Avoid social. On average, subjects are willing to pay \$92.36 in *Avoid social* to enter the dictator game, which is significantly different from the \$100 benchmark ($p < 0.001$, Wilcoxon test). Thus, subjects are on average willing to pay a premium in order to avoid making the dictator decision. In total, 62% of subjects have a WTP below 100%, a fraction that is similar to the first experiment of Lazear, Malmendier, and Weber (2012), where between 50% and 72% prefer to avoid a dictator game. See Panel A of Figure 4 for the distribution. Thus, we replicate the finding of significant decision avoidance found by the previous literature.

Avoid non-social. In *Avoid non-social*, subject's WTP to enter the *Self non-social* decision is \$92.72, which is significantly different from the \$100 benchmark ($p < 0.001$, Wilcoxon test). In total, 63% of subjects have a WTP below 100%. Thus, we find substantial avoidance behavior in our *non-social* setting as well. See Panel B of Figure 4 for the distribution.[24]

Comparing *Avoid social* and *Avoid non-social*. Again, behavior in both decisions is very similar. We cannot reject equality of both averages ($p = 0.81$, Wilcoxon test) and the distributions of behavior are similarly shaped, see Figure 4. Importantly, as in our other settings, we find a significant within-subject correlation of $r = 0.35$ ($p < 0.001$) between the two decisions. Consequently, avoidance behavior in *Avoid social* is significantly associated with avoidance behavior in *Avoid non-social*, see Panel C of Figure 4).

Result 4. *We show that subjects not only avoid engaging in a Self social decision but also avoid a Self non-social decision with a similar magnitude. Moreover, the extent of the avoidance of both decisions is correlated on the individual level.*

7 Conclusion

We provide evidence that four key behavioral patterns from the literature on prosocial behavior, namely people's tendency (i) to favor members of their ingroup over others (ingroup-favoritism), (ii) to disproportionately favor themselves at the cost of others (selfishness), (iii) to redistribute more from windfall endowments compared to earned endowments (merit-based fairness ideal), and (iv) to avoid situations where one is solicited to make prosocial choices (avoiding the ask behavior), can be explained by people's response to interpersonal utility comparisons and their aversion to the uncertainty inherent in such comparisons.

Our results suggest that a significant degree of heterogeneity in prosocial behavior, both within a given decision setting and between different settings, may be driven by people's

[24] As a consistency check, we can test whether subjects' WTP for the gift card predicts their WTP to enter the *Self non-social* decision in *Avoid non-social*. We would expect subjects with higher gift card WTP to have a higher WTP to enter, as ceteris paribus their expected payoff when entering is higher. Indeed, we find both WTPs to be significantly correlated ($r = 0.33, p < 0.001$).

response to interpersonal uncertainty instead of differences in social preferences. As a consequence, standard prosocial choice tasks generally do not reveal solely social preferences but a combination of social preferences and responses to uncertainty. At the same time, our results also underscore the relevance of social preferences for prosocial behavior, as our framework takes the perspective of unbiased utilitarian preferences facing uncertainty. In particular, our application to avoiding the ask behavior highlights that even inherently altruistic individuals may avoid giving situations due to the complexity of making prosocial decisions. Hence, observing that otherwise altruistically acting individuals avoid prosocial decision-situations may not be sufficient to conclude that social preferences do not exist.

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Appendix

A Proofs

Proof of Theorem 1. For simplicity, whenever possible we will write $E_{v_i \sim f_i}$ simply as E_{f_i}. From the utility expression, we get

$$\frac{d}{dx} EU(x) = E_{f_1, f_2} \left((v_1 - v_2) U' \left(v_1 x + v_2 (100 - x) \right) \right)$$

and

$$\frac{d^2}{dx^2} EU(x) = E_{f_1, f_2} \left((v_1 - v_2)^2 U'' \left(v_1 x + v_2 (100 - x) \right) \right) < 0$$

as $U'' < 0$ and $f_1, f_2 \geq 0$. $\frac{d^2}{dx^2} EU(x)$ being strictly positive implies that $\frac{d}{dx} EU(x) = 0$ must be obtained at a unique point.
Evaluating the first derivative at $x = 50$, we get

$$\frac{d}{dx} EU(x)|_{x=50} = E_{f_1, f_2} (v_1 - v_2) U' \left(50 v_1 + 50 v_2 \right) \tag{1}$$

(i) When f_1 and f_2 are identical, then we can also rewrite

$$\begin{aligned} \frac{d}{dx} EU(x) &= E_{v_1 \sim f_1, v_2 \sim f_2} (v_1 - v_2) U' \left(v_1 x + v_2 (100 - x) \right) \\ &= E_{v_1 \sim f_2} E_{v_2 \sim f_1} (v_1 - v_2) U' \left(v_1 x + v_2 (100 - x) \right) \\ &= E_{v_2 \sim f_2} E_{v_1 \sim f_1} (v_2 - v_1) U' \left(v_2 x + v_1 (100 - x) \right) \\ &= E_{f_1, f_2} (v_2 - v_1) U' \left(v_2 x + v_1 (100 - x) \right) \end{aligned}$$

where the first step integrates v_1 over f_2 and v_2 over f_1 instead, the second step interchanges the names of variables (v_1 and v_2) of integration, and the last step interchanges the order of integration. Now evaluating the final expression at $x = 50$, we get

$$\frac{d}{dx} EU(x)|_{x=50} = E_{f_1, f_2} (v_2 - v_1) U' \left(50 v_1 + 50 v_2 \right) \tag{2}$$

Equations 1 and 2 together imply that $\frac{d}{dx} EU(x)|_{x=50} = -\frac{d}{dx} EU(x)|_{x=50}$, and hence, $\frac{d}{dx} EU(x)|_{x=50} = 0$.

ii) When the distribution f_1 second order stochastically dominates f_2, then there exists a random variable $z \sim f_z$ with zero expectation conditional on any given value of v_1, such that v_2 has the same distribution as $v_1 + z$, or in other words, $v_2 =^d v_1 + z$. Therefore, we can replace v_2 by a variable $w_1 + z$ where w_1 and v_1 both have identical distribution f_1.

$$\frac{d}{dx} EU(x) = E_{v_1 \sim f_1} E_{w_1 \sim f_1} E_{z | v_1, v_2} (v_1 - w_1 - z) U' \left(v_1 x + (w_1 + z)(100 - x) \right)$$

Therefore,

$$\frac{d}{dx}EU(x)|_{x=50} = E_{f_1}E_{f_1}E_{z|v_1,v_2}(v_1 - w_1 - z)U'\left(50v_1 + 50w_1 + 50z\right) \tag{3}$$

Because the integration outside $E_{\{f_1,f_1\}}$ is happening with respect to two identical independent distributions, we can interchange the variable names for w_1 and v_1 in Equations 3 to get

$$\frac{d}{dx}EU(x)|_{x=50} = E_{f_1,f_1}E_{z|v_1,v_2}(w_1 - v_1 - z)U'\left(50v_1 + 50w_1 + 50z\right) \tag{4}$$

Adding equations 3 and 4, and then using law of iterated expectations:

$$\begin{aligned}
2\frac{d}{dx}EU(x)|_{x=50} &= E_{f_1,f_1}E_{z|v_1,v_2}(-2z)U'\left(50v_1 + 50w_1 + 50z\right) \\
&= -E_{f_1,f_1}\left(E_{z|v_1,v_2}2zU'\left(50v_1 + 50w_1 + 50z\right)\right) \\
&> -E_{f_1,f_1}\left(E_{z|v_1,v_2}2zU'\left(50v_1 + 50w_1\right)\right) \\
&= -E_{f_1,f_1}U'\left(50v_1 + 50w_1\right)\left(E_{z|v_1,v_2}2zf_z(z|v_1)dz\right) \\
&= 0
\end{aligned}$$

The inequality follows from the following fact: $zU'\left(50v_1 + 50w_1 + 50z\right) < zU'\left(50v_1 + 50w_1\right)$ irrespective of whether $z > 0$ or $z < 0$. The last step follows from the fact that $E_{z|v_1,v_2}z = 0$ Therefore, $\frac{d}{dx}EU(x)|_{x=50} > 0$, and thus, the optimal allocation must allocate more than 50 to the ingroup member.

Next,

$$\begin{aligned}
\frac{d}{dx}EU(x)|_{x=100} &= E_{f_1}E_{f_1}E_{z|v_1,v_2}(v_1 - w_1 - z)U'\left(100v_1\right) \\
&= E_{f_1}E_{f_1}U'\left(100v_1\right)E_{z|v_1,v_2}(v_1 - w_1 - z) \\
&= E_{f_1}E_{f_1}U'\left(100v_1\right)(v_1 - w_1) \\
&= E_{f_1}E_{f_1}U'\left(100w_1\right)(w_1 - v_1) \\
&= \frac{1}{2}E_{f_1}E_{f_1}[U'\left(100w_1\right)(w_1 - v_1) + U'\left(100v_1\right)(v_1 - w_1)] \\
&= \frac{1}{2}E_{f_1}E_{f_1}(U'(100w_1) - U'(100v_1))(w_1 - v_1) \\
&< 0
\end{aligned}$$

The first step replaces $x = 100$ into the expression of $\frac{d}{dx}EU(x)$ derived at the beginning of the proof. The second step uses that $U'\left(100v_1\right)$ is independent of z. The third step uses $E_{z|v_1,v_2}z = 0$. The fourth step uses the property that v_1, w_1 are drawn i.i.d from f_1, and hence those two variable names can be interchanged. The fifth step uses the average of the two expressions from the previous lines. The last step uses the property that U' is decreasing.

As $\frac{d}{dx}EU(x)|_{x=100} < 0$, the concavity of the expression implies that $\frac{d}{dx}EU(x) = 0$ must be obtained at some $50 < x < 100$.

(iii) The individual chooses her optimal allocation x^* (for asset 1) to maximize her expected (or average) utility

$$x^* = \arg\max E_{f_1,f_2} U(xv_1 + (100 - x)(v_2 + c))$$

where $U' > 0, U'' < 0$

The first derivative of the objective function, evaluated at x^*, should be zero.

$$E_{f_1,f_2}(v_1 - v_2 - c)U'(x^* v_1 + (100 - x^*)(v_2 + c)) = 0 \tag{5}$$

And then taking the implicit derivative of the last equation w.r.t c,

$$E_{f_1,f_2}[-U' + (v_1 - v_2 - c)^2 \frac{dx^*}{dc} U'' + (v_1 - v_2 - c)(100 - x^*)U''] = 0$$

Whenever U', U'' are evaluated at we will suppress the argument of the function for brevity. Re-arranging,

$$\frac{E_{f_1,f_2}[-U' + (v_1 - v_2 - c)(100 - x^*)U'']}{-E_{f_1,f_2}(v_1 - v_2 - c)^2 U''} = \frac{dx^*}{dc} \tag{6}$$

Next, we bound $\frac{dx^*}{dc}$ in 6 steps, where each step is explained in the text following the equations. Under CARA preferences,

$$\begin{aligned}
\frac{dx^*}{dc} &= \frac{E_{f_1,f_2} - U'}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} + \frac{E_{f_1,f_2}(v_1 - v_2 - c)(100 - x^*)U''}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&= \frac{E_{f_1,f_2} - U'}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} + \frac{E_{f_1,f_2}(v_1 - v_2 - c)(100 - x^*) \times \frac{U''_{100}}{U'_{100}} U'}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&= \frac{E_{f_1,f_2} - U'}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} + \frac{(U''_{100})(100 - x^*)}{U'_{100}} \frac{E_{f_1,f_2}(v_1 - v_2 - c)U'}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&= \frac{E_{f_1,f_2} - U'}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} + \frac{(U''_{100})(100 - x^*)}{U'_{100}} \times \frac{0}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&< 0
\end{aligned}$$

The first step simply re-arranges equation 6.

The second step utilizes the assumption of constant absolute risk-aversion: $\frac{U''}{U'} = \frac{U''_{100}}{U'_{100}}$, and hence, $U'' = \frac{U''_{100}}{U'_{100}} U'$. The third step simply reorganizes the numerator in the second additive term.

The fourth step uses equation 5 to set $E_{f_1,f_2}(v_1 - v_2 - c)U'$ to zero. The last step uses $U' > 0, U'' < 0$.

Under CRRA preferences,

$$\begin{aligned}
\frac{dx^*}{dc} &= \frac{E_{f_1,f_2}[-U' + (v_1 - v_2 - c)(100 - x^*)U'']}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&= \frac{E_{f_1,f_2}[-U' - (x^* v_1 + (100 - x)(v_2 + c))U'' + 100 v_1 U'']}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&= \frac{E_{f_1,f_2}[-U' + rU' + 100 v_1 U'']}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''} \\
&= \frac{E_{f_1,f_2}[-(1 - r)U' + 100 v_1 U'']}{-E_{f_1,f_2}(v_1 + c - v_2)^2 U''}
\end{aligned}$$

The third step utilizes the CRRA parameter $r < 1$. In the last expression, the numerator is negative as $r < 1, v_1 \geq 0, U'' < 0$ and the denominator is positive, which concluces the proof.

□

Proof of Theorem 2. As v_1, v_2 are random variables, i's expected utility from allocating x to the outgroup is:

$$EU(x) = E_{v_1 \sim f_1, v_2 \sim f_2} \min\{v_1 x, v_2(100 - x)\}$$

For any $x \in [0, 50) \cup (50, 100]$,

$$\begin{aligned}
\min\{v_1(100 - x), v_2 x\} + \min\{v_1 x, v_2(100 - x)\} &\leq v_1(100 - x) + v_1 x \\
&= 100 v_1
\end{aligned}$$

with strict inequality whenever $v_1 \neq v_2$.[25]
Similarly, $\min\{v_1(100 - x), v_2 x\} + \min\{v_1 x, v_2(100 - x)\} \leq 100 v_2$ with strict inequality whenever $v_1 \neq v_2$. Putting these two inequalities together, we get

$$\min\{v_1(100 - x), v_2 x\} + \min\{v_1 x, v_2(100 - x)\} \leq \min\{100 v_1, 100 v_2\}$$

with strict inequality whenever $v_1 \neq v_2$. Next, using $f_1 = f_2$,

$$\begin{aligned}
EU(x) &= E_{v_1 \sim f_1, v_2 \sim f_2} \min\{v_1 x, v_2(100 - x)\} \\
&= E_{v_1 \sim f_1, v_2 \sim f_2} \min\{v_1(100 - x), v_2 x\}
\end{aligned}$$

[25] If $x = 50$, then strict inequality does not hold under $v_1 < v_2$.

Therefore, for any $x \in [0, 50) \cup (50, 100]$,

$$\begin{aligned} EU(x) &= \frac{1}{2} \times E_{v_1 \sim f_1, v_2 \sim f_2} \left(\min\{v_1 x, v_2(100 - x) + \min\{v_1(100 - x), v_2 x\}\right) \\ &< \frac{1}{2} \times E_{v_1 \sim f_1, v_2 \sim f_2} \min\{100 v_1, 100 v_2\} \\ &= E_{v_1 \sim f_1, v_2 \sim f_2} \min\{50 v_1, 50 v_2\} \end{aligned}$$

The first inequality becomes strict as $v_1 \neq v_2$ with positive probability in the integration. This proves part (i), and a similar proof works for part (ii) after v_2 is replaced with $w_1 + z_1$ like in the proof of Theorem 1.

□

B Additional tables

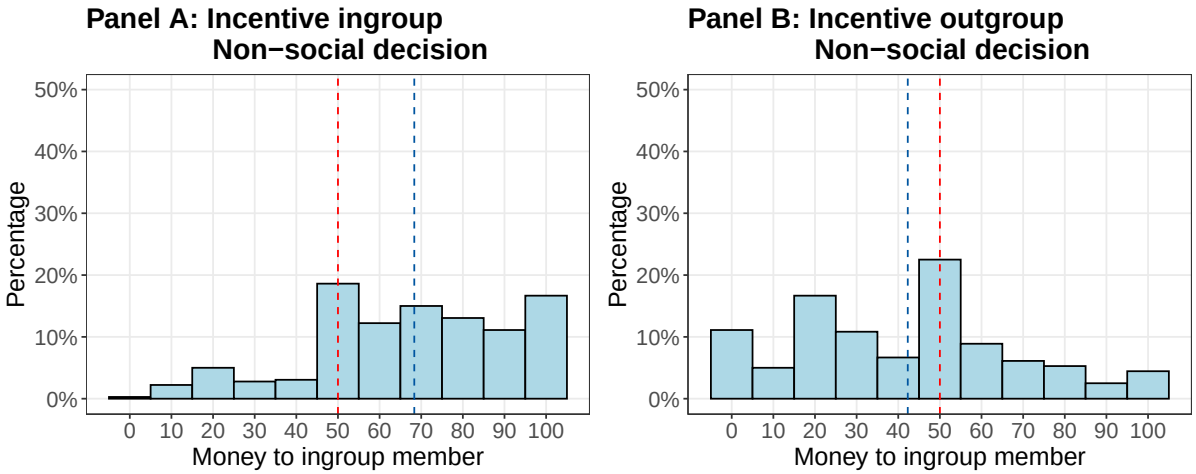
Table B.1: Treatment effect of the information treatment in the self versus other setting

	Dependent variable:	
	Allocation to ingroup member	
	Within-effect (1)	Between-effect (2)
Info outgroup WTP is higher	-6.096^{***}	-6.301^{**}
	(1.395)	(2.927)
Constant (Info Ingroup WTP is higher)	64.202^{***}	65.268^{***}
	(1.543)	(2.204)
Subjects	122	122
Observations	732	366
R^2	0.021	0.024

Notes: The table shows OLS estimates. The dependent variable in columns (1) and (2) is the amount subjects allocate to the ingroup member (out of $100) in the *Info ingroup* and *Info outgroup* treatments. "Info outgroup WTP is higher" is a dummy variable equal to one if prior to the decision the subject received the information that the outgroup member's WTP was higher, and equal to zero if the information was that the ingroup member's WTP was higher. In column (1), all decisions are used, in (2) only the first decisions. Standard errors (in parentheses) are clustered at the subject level. Significance levels: $^{*}p<0.1$, $^{**}p<0.05$ and $^{***}p<0.01$.

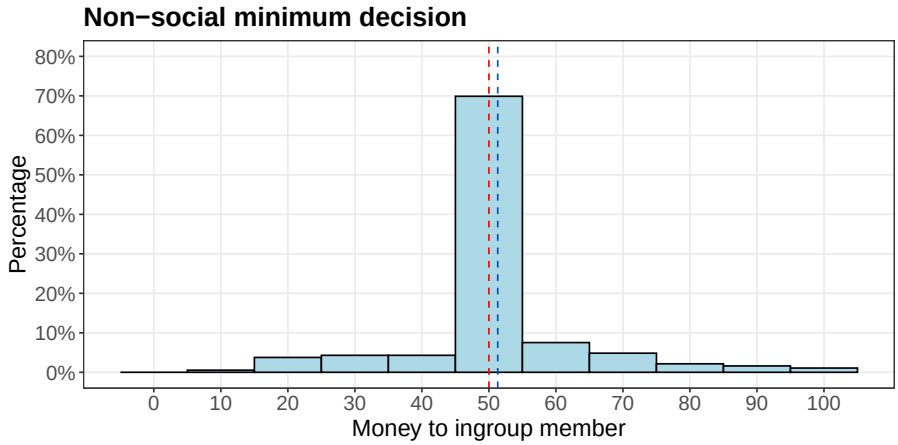
C Additional figures

Figure C.1: Incentive Ingroup and Incentive Outgroup robustness treatment results



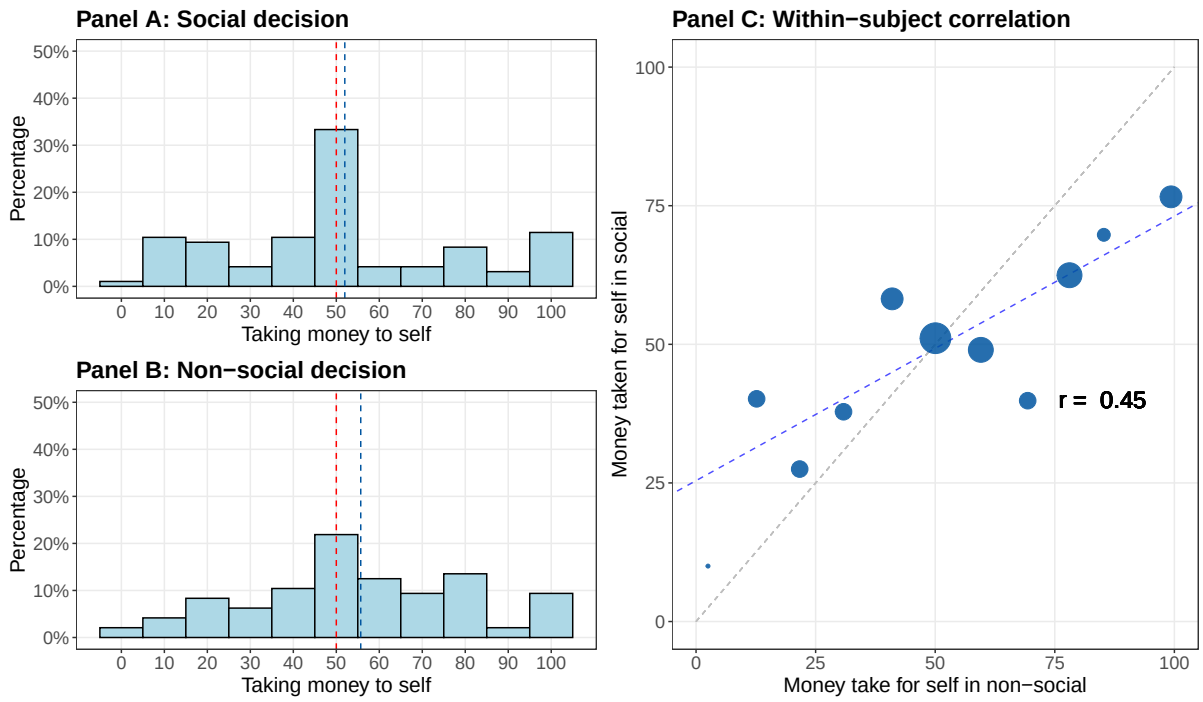
Notes: **Panel A and B:** Histogram of *Incentive ingroup* (Panel A) and *Incentive outgroup* (Panel B) decisions. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to the ingroup member instead of the outgroup member. Subjects incentive is to maximize the weighted sum of the in- and outgroup members WTP. In Panel A, the ingroup receives three times the weight, in Panel B, the outgroup receives three times the weight. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. For both panels, the binwidth is 10. Decisions are pooled across the three groups (shared hobbies/interests, political views, and religious beliefs), each panel thus displays $n = 360$ decisions by 120 subjects.

Figure C.2: Non-social minimum robustness treatment results



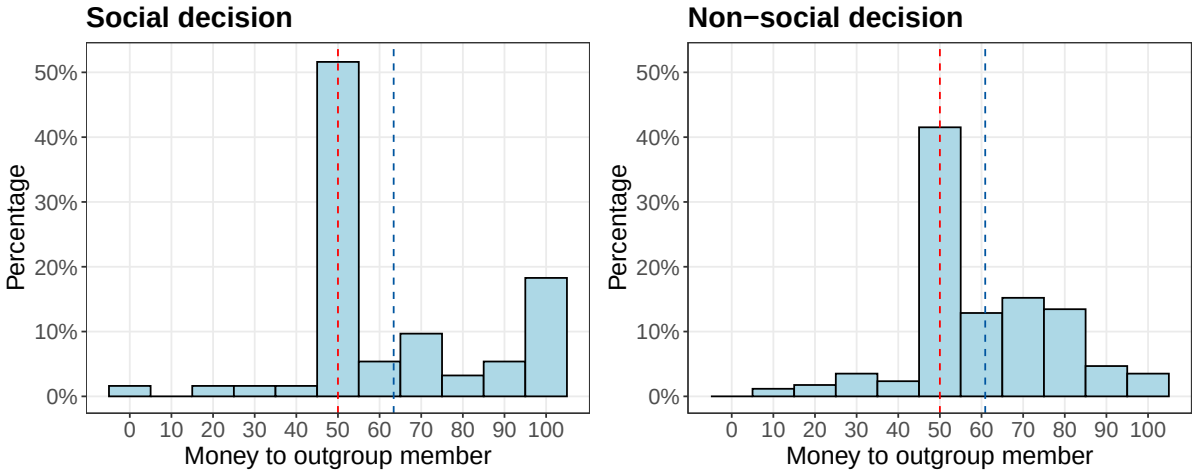
Notes: Histogram of *Non-social minimum* decisions. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to the ingroup member instead of the outgroup member. Subjects incentive is to maximize the minimum of the in- and outgroup member's WTP weighted with subject's allocation. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. For both panels, the binwidth is 10. Decisions are pooled across the three groups (shared hobbies/interests, political views, and religious beliefs), each panel thus displays $n = 186$ decisions by 62 subjects.

Figure C.3: Giving versus taking results excluding non-takers



Notes: **Panel A and B:** Histogram of the *Taking social* (Panel A) and *Taking non-social* (Panel B) decision. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to themselves instead of another individual. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Taking social* (Panel A), the other individual has earned the $100 and subjects decide how much to take away for themselves. Their decision has consequences for themselves and the other individual. In *Taking non-social* (Panel B), the decision has consequences only for the subjects, with their payoff depending on their WTP and the other individual's WTA for the gift card. **Panel C:** Binned scatter plot of the *Taking social* and *Taking non-social* decision. The blue dotted line displays the linear fit of a regression of the *Taking social* on the *Taking non-social* decision. The correlation coefficient is $r = 0.32$. For all three panels, the binwidth is 10. Excluded are subjects that take nothing from the other individual in *Taking social*. Thus, displayed are $n = 96$ decision-pairs by 96 subjects.

Figure D.1: Ingroup between subject



Notes: Histogram of *Ingroup social* (Panel A) and *Ingroup non-social* (Panel B) decisions. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to the ingroup member instead of the outgroup member. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Ingroup social* (Panel A), the decisions have consequences for the in- and outgroup members. In *Ingroup non-social* (Panel B), the decisions have consequences only for the subjects, with their payoff depending on the in- and outgroup member's WTP for the gift card. For both panels, the binwidth is 10. Decisions are pooled across the three groups (shared hobbies/interests, political views, and religious beliefs). Only the first set of decisions is used for each subject. Panel A displays $n = 186$ decisions by 62 subjects, Panel B displays $n = 171$ decisions by 57 subjects.

D Between-subject analyses

The results covered in the main text were obtained using our within-subject design, where subject faced the *social* and *non-social* decisions in random order. In the following, we repeat our analyses using only the first decision each subjects faced, which gives us a between-subject comparison. In general, our within-subject results replicate well in the between-subject analyses.

D.1 Ingroup versus outgroup paradigm main results

***Ingroup social* decisions.** In the between-subject case, subjects allocate on average $57.48 if their ingroup members shares the same interests/hobbies, $71.05 if political views are shared and $61.61 if religious beliefs are shared. In all three cases, we can reject the hypothesis of no ingroup-favoritism ($p < 0.01$, Wilcoxon tests). Figure D.1 panel A displays the distribution pooled over the three decisions. In 46% of the decisions, subjects display ingroup-favoritism by allocating strictly more than 50% to the ingroup. Outgroup-favoritism is found in 8% of decisions, and in the remaining 46%, subjects allocate 50/50. In total, 73% of subjects display ingroup-favoritism in at least one decision.

***Ingroup non-social* decisions.** When facing the *Ingroup non-social* decisions first, subjects allocate on average $56.86 to their ingroup members sharing the same interests/hobbies,

$65.02 if political views are shared an $60.81 if religious beliefs are shared. We reject the hypothesis of no ingroup-favoritism ($p < 0.01$, Wilcoxon tests) in all three cases. Figure D.1 panel B displays the distribution. In 61% of the decisions, subjects display ingroup-favoritism by allocating strictly more than 50% to the ingroup. Outgroup-favoritism is found in 11% of decisions, and in the remaining 28%, subjects allocate 50/50.

Comparing *Ingroup social* and *non-social*. Comparing average ingroup allocations between *Ingroup social* and *non-social* between-subject reveals that we cannot reject equality in all three cases ($p = 0.59$ for hobbies/interests, $p = 0.22$ for political views, $p = 0.38$ for religious beliefs, Wilcoxon tests). We cannot reject that the pooled distributions are equal for the case of hobbies/interests ($p = 0.15$, Kolmogorov-Smirnov test) and religious beliefs ($p = 0.10$, Kolmogorov-Smirnov test). For political views, distributions are significantly different ($p = 0.004$, Kolmogorov-Smirnov test).

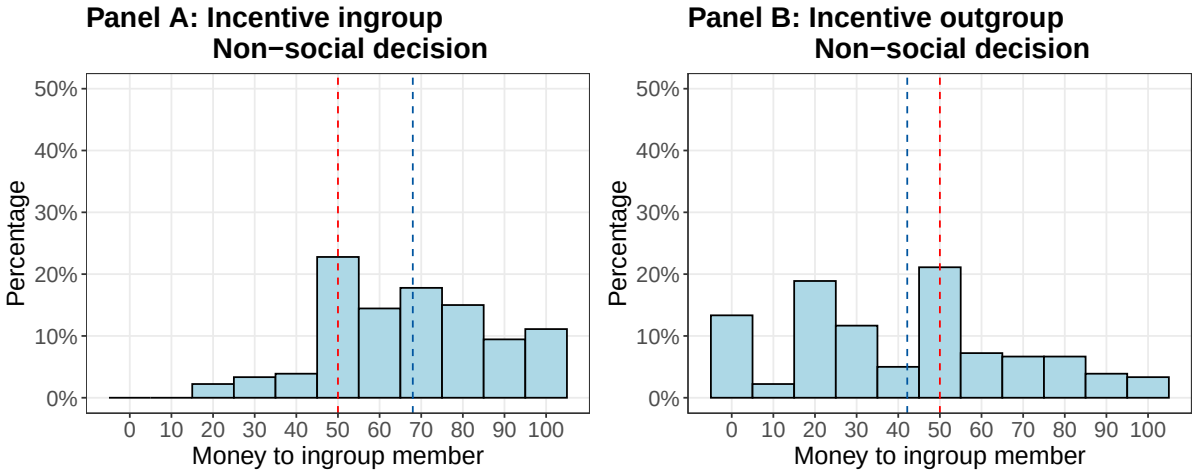
D.2 Ingroup versus outgroup setting information

As displayed in Table B.1, the effect of the information on allocations to the ingroup member are very similar in magnitude when comparing the between-effect with the within-effect. Across groups, when given the information that the outgroup member's WTP is higher, subjects allocate on average $58.97 to the ingroup member. In contrast, they allocate $65.27 to the ingroup member when the information is that the ingroup member's WTP is higher.

D.3 Ingroup versus outgroup setting incentive robustness

Table D.1 displays the treatment of *Outgroup incentive* relative to *Ingroup incentive* effects separately for the within-subject and between-subject effect pooled across the three groups. As displayed, the effect is similar in both the within- and between-subject comparison. Regarding the between-subject effects in the social groups individually, when the ingroup is incentivised, average ingroup allocations increase from $56.86 to $66.60 for hobbies/interests ($p < 0.01$, Wilcoxon tests), from $ 65.02 to $71.82 for political views ($p = 0.07$), and from $60.81 to $65.52 for religious beliefs ($p = 0.17$) compared to *Ingroup non-social*. Conversely, in *outgroup incentive*, allocations to the ingroup decrease to $38.28 for hobbies/interests, to $46.03 for politics and to $42.17 for religious beliefs (all three $p < 0.001$). As in the within-subject comparison, we again see outgroup favoritism in the *Outgroup incentive* decisions. The pooled average is $42.16, which is significantly different from the even split ($p < 0.001$, Wilcoxon test). See Figure D.2 for the distributions.

Figure D.2: Ingroup incentive between subject



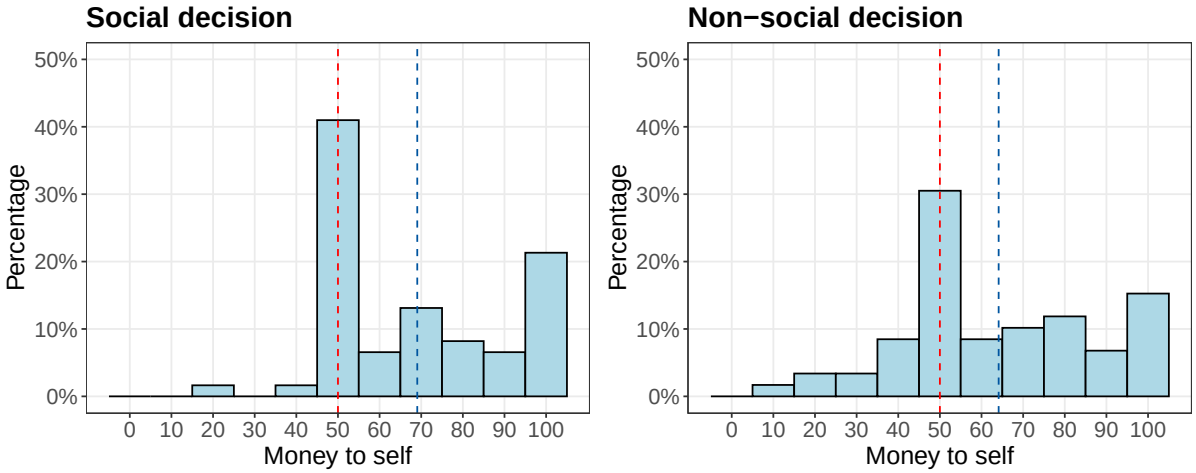
Notes: Histogram of *Incentive ingroup* (Panel A) and *Incentive outgroup* (Panel B) decisions. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to the ingroup member instead of the outgroup member. Subjects incentive is to maximize the weighted sum of the in- and outgroup members WTP. In Panel A, the ingroup receives three times the weight, in Panel B, the outgroup receives three times the weight. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. For both panels, the binwidth is 10. Decisions are pooled across the three groups (shared hobbies/interests, political views, and religious beliefs). Only the first set of decisions is used for each subject. Each panel thus displays $n = 180$ decisions by 60 subjects.

Table D.1: Treatment effect of the incentive treatment in the ingroup versus outgroup setting

	Dependent variable:	
	Allocation to ingroup member	
	Within-subject (1)	Between-subject (2)
Outgroup incentive	−26.047***	−25.817***
	(3.163)	(3.547)
Constant (*Ingroup incentive*)	68.333***	67.978***
	(1.937)	(2.083)
Subjects	120	120
Observations	720	360
R^2	0.211	0.231

Notes: The table shows OLS estimates. The dependent variable in columns (1) and (2) is the amount subjects allocate to themselves (out of $100) in the *Ingroup incentive* and *Ingroup incentive* treatments. "Outgroup incentive" is a dummy variable equal to one if the incentive for the decision gave three times the weight on the outgroup member's WTP, and equal to zero if the incentive gave three times the weight on the ingroup member's WTP. In column (1), all decisions are used, in (2) only the first decisions. Standard errors (in parentheses) are clustered at the subject level. Significance levels: *p<0.1, **p<0.05 and ***p<0.01.

Figure D.3: Dictator game between subject



Notes: Histogram of the *Self social* (Panel A) and *Self non-social* (Panel B) decision. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to themselves instead of another individual. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Self social* (Panel A), the decision has consequences for the subjects and the other individual. In *Self non-social* (Panel B), the decision has consequences only for the subjects, with their payoff depending on their and the other individual's WTP for the gift card. For both panels, the binwidth is 10. Only the first decision is used for each subject. Panel A displays $n = 61$ decisions by 61 subjects, Panel B displays $n = 59$ decisions by 59 subjects.

D.4 Self versus others setting

***Self social* decision.** In the between-subject case of the *Self social* decision, subjects allocate on average $69.05 to themselves, thus displaying significant self-regarding behavior relative to the equal split ($p < 0.001$, Wilcoxon test). Figure D.3 panel A displays the distribution. In total, 61% of subjects allocate more money to themselves, 3% allocate more to the other person, and 36% implement the 50/50 split.

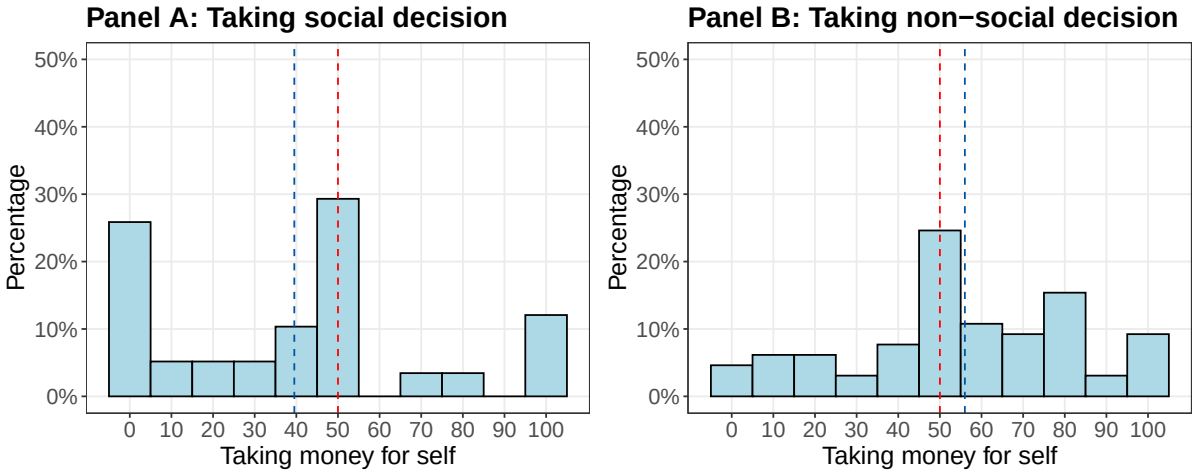
***Self non-social* decision.** When facing the *Self non-social* decision as first decision, subjects allocate on average $64.12 to themselves, again displaying significant self-regarding behavior ($p < 0.001$, Wilcoxon tests). Figure D.3 panel B shows the distribution. In total, 58% of subjects allocate more money to themselves, 17% allocate more to the other person, and 25% implement the 50/50 split.

Comparing *Self social* and *non-social*. In the between-subject comparison, we also cannot reject equality of average allocations between *Self social* and *non-social* ($p = 0.27$, Wilcoxon tests). Similarly, we cannot reject that the pooled distributions are equal ($p = 0.39$, Kolmogorov-Smirnov test).

D.5 Giving versus taking setting

***Self taking social* decision.** In the between-subject case, subjects allocate (take) $39.52 to themselves, as in the within-subject case a significant decrease ($p < 0.001$, Wilcoxon test)

Figure D.4: Dictator taking game between subject



Notes: Histogram of the *Taking social* (Panel A) and *Taking non-social* (Panel B) decision. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to themselves instead of another individual. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. In *Taking social* (Panel A), the other individual has earned the $100 and subjects decide how much to take away for themselves. Their decision has consequences for themselves and the other individual. In *Taking non-social* (Panel B), the decision has consequences only for the subjects, with their payoff depending on their WTP and the other individual's WTA for the gift card. For both panels, the binwidth is 10. Only the first decision is used for each subject. Panel A displays $n = 58$ decisions by 58 subjects, Panel B displays $n = 65$ decisions by 65 subjects.

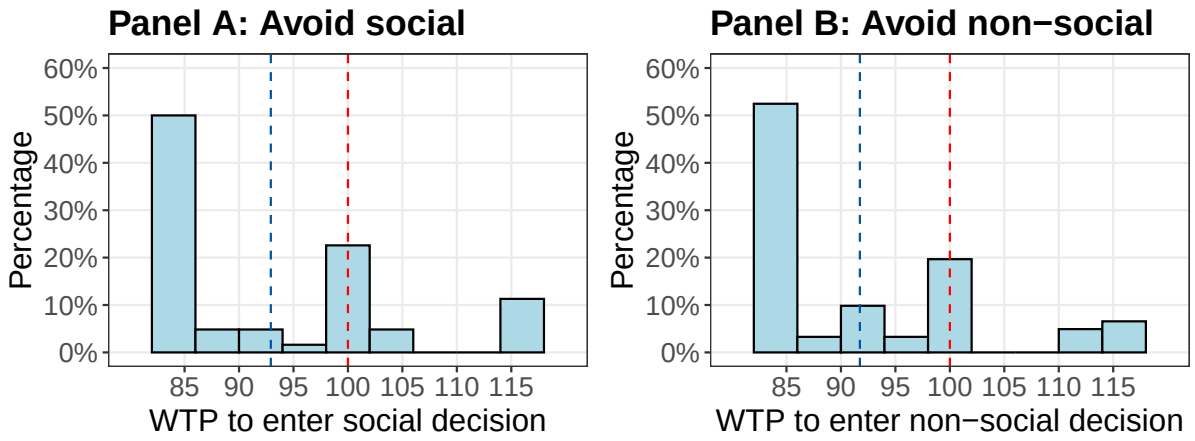
to the $68.05 that subjects allocate to themselves in *Self social*. In total, 21% allocate more money to themselves, while 55% allocate more to the other person, with the remaining 21% allocating the even split. See Figure D.4 Panel A for the between-subject distribution.

***Self taking non-social* decision.** We replicate the finding that own-allocations also decrease in the *non-social* in the between-subject case where we restrict our analysis to the first decision that subjects make. In *Self taking non-social*, subjects allocate $56.00 to themselves, a significant decrease to the $67.02 they allocate to themselves in *Self non-social* ($p = 0.01$, Wilcoxon tests). In total, 49% allocate more money to themselves, 28% allocate more to the other person, and 23% split evenly. See Figure D.4 Panel B for the distribution.

Comparing *Self taking social* and *Self taking non-social*. As in the within-subject case, average allocations ($p < 0.01$, Wilcoxon test) and distributions ($p < 0.01$, Kolmogorov-Smirnov test) differ from each other in the between-subject case.In total, 26% of subjects choose to take $0 for themselves in *Self taking social*, while only 3% do so in *Self taking non-social*.

Focusing only on the subjects that take more than $0 for themselves, also in the between case we can no longer reject that average giving ($p = 0.30$, Wilcoxon test) and distributions ($p = 0.22$, Kolmogorov-Smirnov test) between *Self taking social* and *Self taking non-social* are the same.

Figure D.5: Avoiding the ask between subject



Notes: **Panel A:** Histogram of the *Avoid social* decision. The x-axis denotes the subject's willingness-to-pay to avoid participating in the *Self social* decision. **Panel B:** Histogram of the *Avoid non-social* decision. The x-axis denotes the subject's willingness-to-pay to avoid participating in the *Self non-social* decision. The red dotted line denotes the even split benchmark, the blue dotted line the average willingness-to-pay to avoid the respective decision. For both panels, the binwidth is 10. Only the first decision is used for each subject. Panel A displays $n = 62$ decisions by 62 subjects, Panel B displays $n = 61$ decisions by 61 subjects.

D.6 Avoiding the ask setting

Avoid social. In the between-subject case, subjects are willing to pay \$92.92 in *Avoid social* on average to enter the dictator game. Again, this is a significant difference from the \$100 benchmark ($p < 0.001$, Wilcoxon test). In total, 61% of subjects have a WTP below 100%. See Figure D.5 Panel A for the distribution.

Avoid non-social. In *Avoid non-social*, subject's WTP to enter the *Self non-social* decision is \$91.74 when facing the decision first Tis WTP is also significantly different from the \$100 benchmark ($p < 0.001$, Wilcoxon test). In total, 69% of subjects have a WTP below 100%. See Figure D.5 Panel B for the distribution.

Comparing *Avoid social* and *Avoid non-social*. As in the within-subject case, we cannot reject equality of both averages ($p = 0.45$, Wilcoxon test) and distributions ($p = 0.64$, Kolmogorov-Smirnov test).

E Self versus other information and incentive treatments

This section discusses the additional information and incentive treatments for the self versus other paradigm. These treatments closely mirror the robustness treatments for the ingroup versus outgroup paradigm, which are discussed in 3.4.

E.1 Information on WTP

Design. In two treatments *Self info* and *Other info*, varied within-subject in random order, we provide subjects with information on the difference in WTP between their own WTP and the other persons WTP. Specifically, in *Self info* we match subjects with other individuals for which subjects own WTP is 15-25% higher than the other's WTP. In *Other info* we match them so that the other individual member has the 15-25% higher WTP. We inform subjects about the difference and afterwards they face the *Self social* decisions.

Results. We find that the information changes behavior. Subjects allocate on average \$64.90 to the ingroup member when given the information that the outgroup member's WTP is higher, whereas they allocate \$74.20 to the ingroup member when the information is that the ingroup member's WTP is higher. The effect of the information is significant on the 1% level when analysing the effect within-subject, see column (1) Table E.1. The between-subject effect is slightly smaller and not significant, see column (2) of Table E.1.

E.2 Incentive

Design. As in the ingroup case, we vary the incentive subjects face when making the *Self non-social* decisions. In *Self incentive*, the weight on the DM's own WTP is three times as high as the other individuals WTP. The DM's payoff thus becomes:

$$\Pi\left(x_{self}, x_{other}\right) = 3 \cdot x_{self} \cdot WTP_{self} + x_{other} \cdot WTP_{other}$$

In *Other incentive* we increase the weight put on the other individual's WTP to be three times as high as the DM's WTP:

$$\Pi\left(x_{self}, x_{other}\right) = x_{self} \cdot WTP_{self} + 3 \cdot x_{other} \cdot WTP_{other}$$

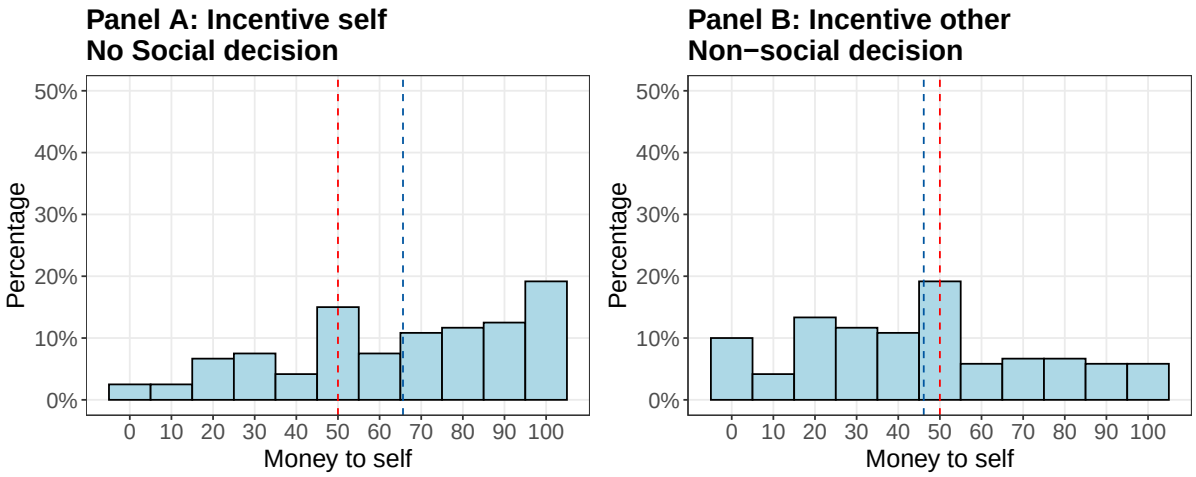
Results. Inducing these incentives changes people's behavior in the *non-social* decision. See Table E.2 for the within-subject and between-subject treatment effect. In both cases lead the change in incentives to a significant change in allocation behavior. Figure E.1 displays the distributions.

Table E.1: Treatment effect of the information treatment in the self versus other setting

	Dependent variable:	
	Allocation to self	
	Within-effect (1)	Between-effect (2)
Info other person WTP is higher	-9.303^{***}	-6.120
	(1.907)	(4.276)
Constant (Info own WTP is higher)	74.205^{***}	72.233^{***}
	(1.857)	(2.538)
Subjects	122	122
Observations	244	122
R^2	0.040	0.017

Notes: The table shows OLS estimates. The dependent variable in columns (1) and (2) is the amount subjects allocate to themselves (out of $100) in the *Info self* and *Info other* treatments. "Info other person WTP is higher" is a dummy variable equal to one if prior to the decision the subject received the information that the other person's WTP was higher, and equal to zero if the information was that the subject's own WTP was higher. In column (1), all decisions are used, in (2) only the first decisions. Standard errors (in parentheses) are clustered at the subject level. Significance levels: *p<0.1, **p<0.05 and ***p<0.01.

Figure E.1: Self versus other incentive



Notes: Histogram of *Self incentive* (Panel A) and *Other incentive* (Panel B) decisions. The x-axis denotes the amount of gift card money (out of $100) that subjects allocate to themselves instead of another individual. Subjects incentive is to maximize the weighted sum of their own and another individuals WTP. In Panel A, subjects own WTP receives three times the weight, in Panel B, the other individual's WTP receives three times the weight. The red dotted line denotes the even split benchmark, the blue dotted line the average allocation. For both panels, the binwidth is 10. Only the first decision is used for each subject. Panel A displays $n = 59$ decisions by 59 subjects, Panel B displays $n = 61$ decisions by 61 subjects.

Table E.2: Treatment effect of the incentive treatment in the self versus other setting

	Dependent variable:	
	Allocation to self	
	Within-subject (1)	Between-subject (2)
Other incentive	-19.500^{***}	-22.079^{***}
	(3.468)	(5.045)
Constant (*Self incentive*)	65.625^{***}	66.424^{***}
	(2.563)	(3.592)
Subjects	120	120
Observations	240	120
R^2	0.108	0.140

Notes: The table shows OLS estimates. The dependent variable in columns (1) and (2) is the amount subjects allocate to themselves (out of $100) in the *Other incentive* and *Self incentive* treatments. "Other incentive" is a dummy variable equal to one if the incentive for the decision gave three times the weight on the other person's WTP, and equal to zero if the incentive gave three times the weight on the subject's own WTP. In column (1), all decisions are used, in (2) only the first decisions. Standard errors (in parentheses) are clustered at the subject level. Significance levels: $^{*}p<0.1$, $^{**}p<0.05$ and $^{***}p<0.01$.

F Research transparency

All experiments covered in the paper were preregistered at aspredicted.org. The preregistrations include details on the experimental design, the sampling process and planned sample size, exclusion criteria, hypotheses, and the main analyses. Table F.1 provides an overview over the treatments and their respective pre-registrations.

Table F.1: Overview over treatments

Label	N	Covered in section	Description
Ingroup social and *Ingroup non-social*	119	Section 3	Pre-reg link: https://aspredicted.org/H81_KQ5
Ingroup incentive and *Outgroup incentive*	120	Section 3.4	Pre-reg link: https://aspredicted.org/H81_KQ5
Ingroup info and *Outgroup info*	122	Section 3.4	Pre-reg link: https://aspredicted.org/H81_KQ5
Ingroup minimum	62	Section 3.4	Pre-reg link: https://aspredicted.org/J7H_W8R
Self social and *Self non-social*	120	Section 4	Pre-reg link: https://aspredicted.org/ZMF_CD9
Self incentive and *Other incentive*	120	Appendix Section E	Pre-reg link: https://aspredicted.org/ZMF_CD9
Self info and *Other info*	122	Appendix Section E	Pre-reg link: https://aspredicted.org/ZMF_CD9
Self taking social and *Self taking non-social*	123	Section 5	Pre-reg link: https://aspredicted.org/RT4_TQB
Avoid social and *Avoid non-social*	123	Section 6	Pre-reg link: https://aspredicted.org/JJM_993

G Experimental instructions

G.1 Ingroup versus outgroup paradigm

G.1.1 Ingroup social and non-social screens

Figure G.1: Ingroup social and non-social screen 1

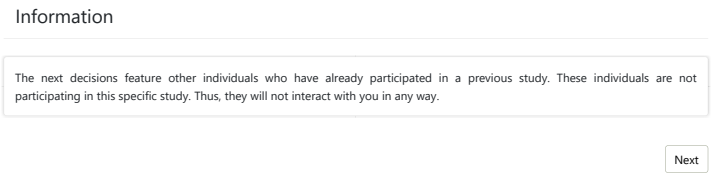


Figure G.2: Ingroup social and non-social screen 2

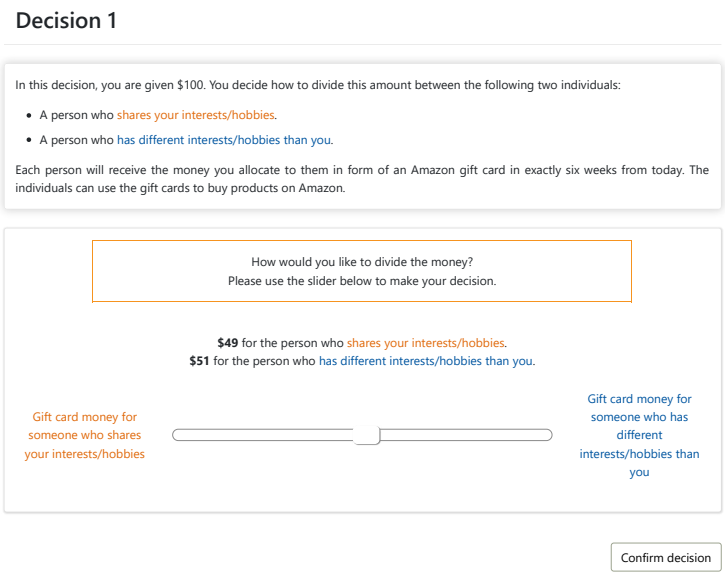


Figure G.3: Ingroup social and non-social screen 3

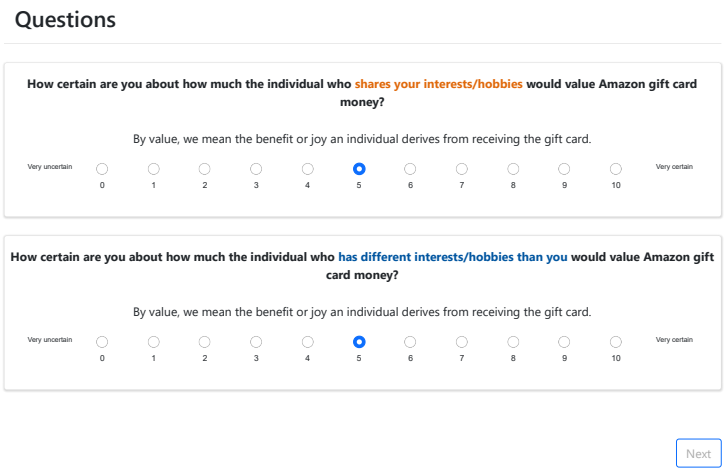


Figure G.4: Ingroup social and non-social screen 4

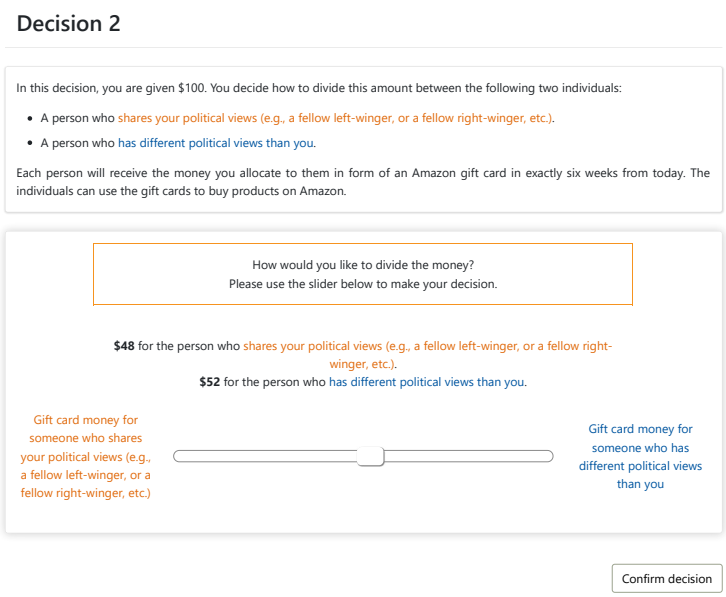


Figure G.5: Ingroup social and non-social screen 5

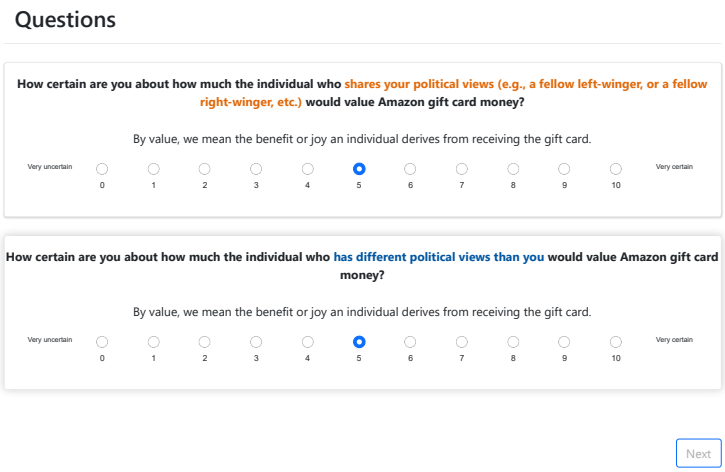


Figure G.6: Ingroup social and non-social screen 6

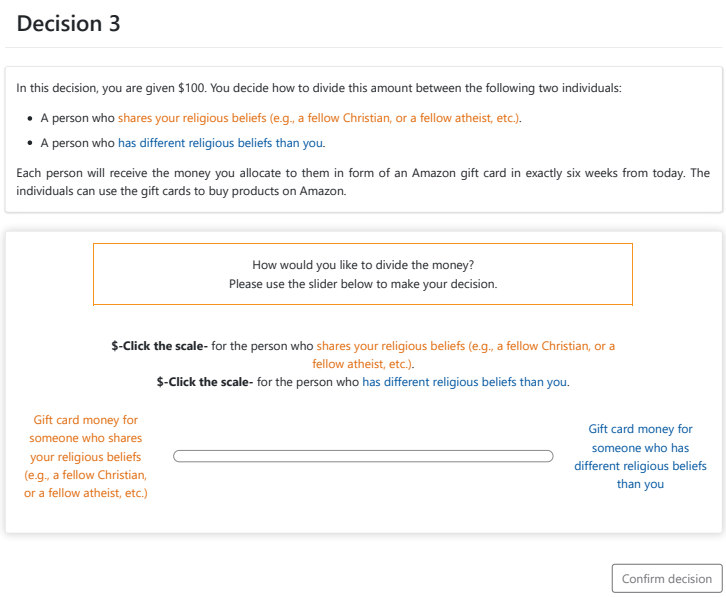


Figure G.7: Ingroup social and non-social screen 7

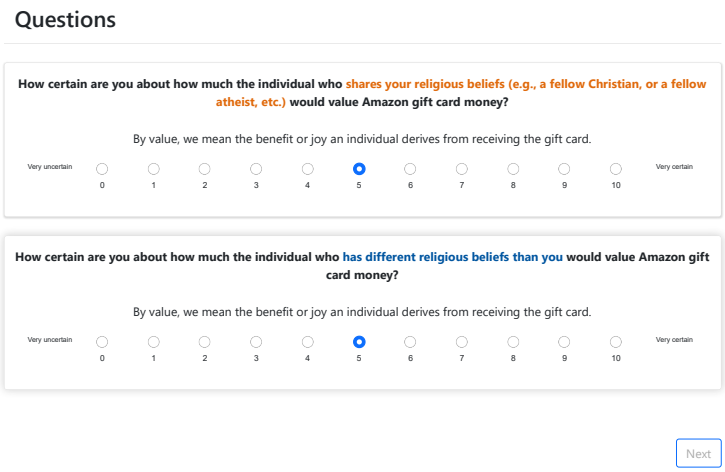


Figure G.8: Ingroup social and non-social screen 8

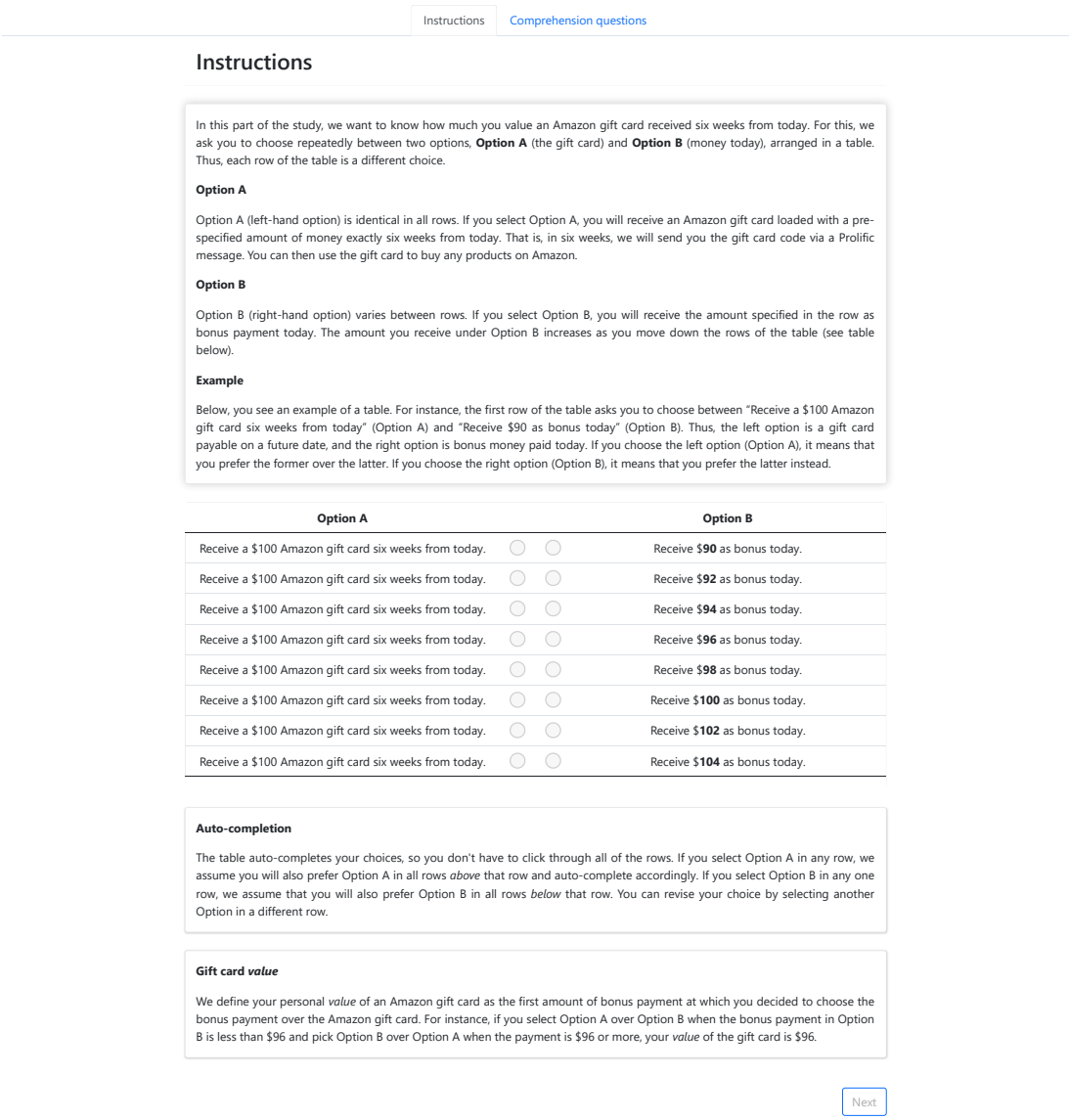


Figure G.9: Ingroup social and non-social screen 9

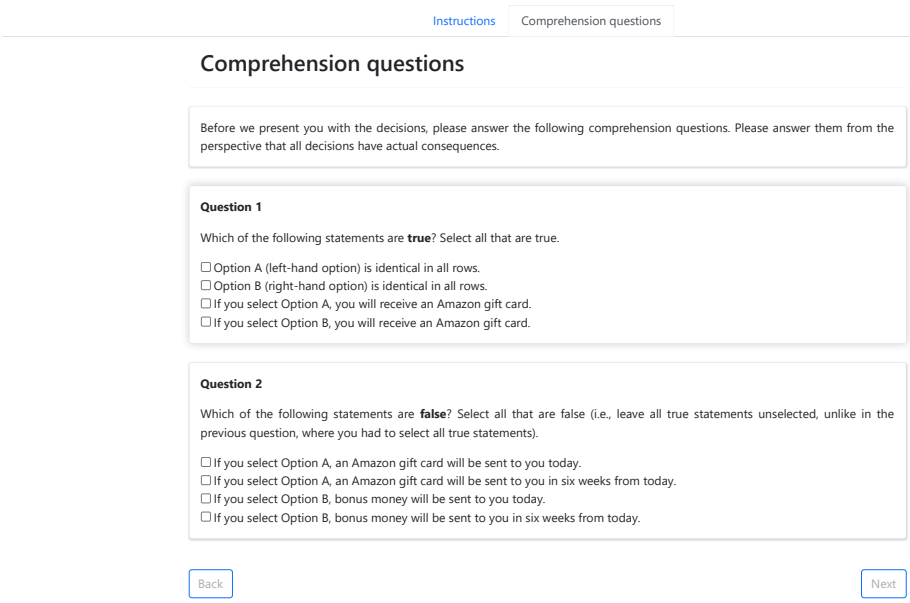


Figure G.10: Ingroup social and non-social screen 10

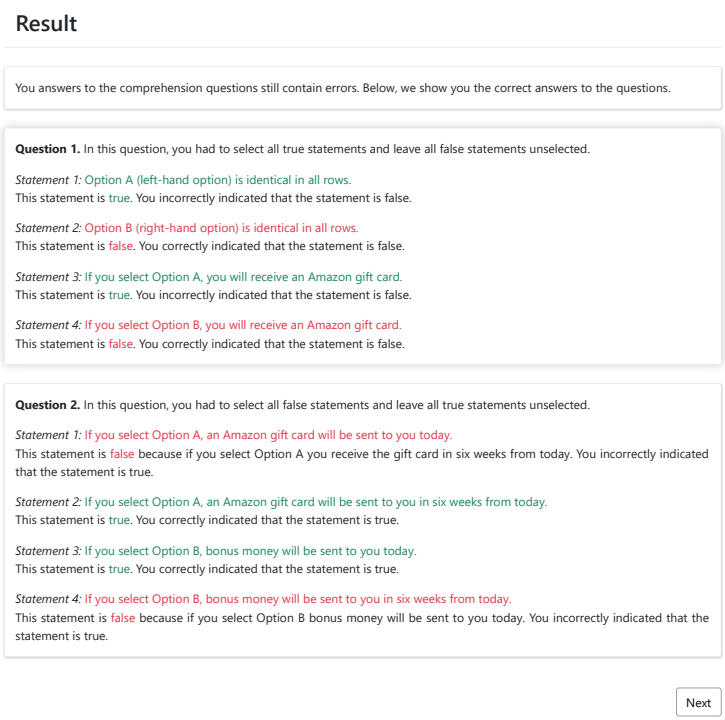


Figure G.11: Ingroup social and non-social screen 11

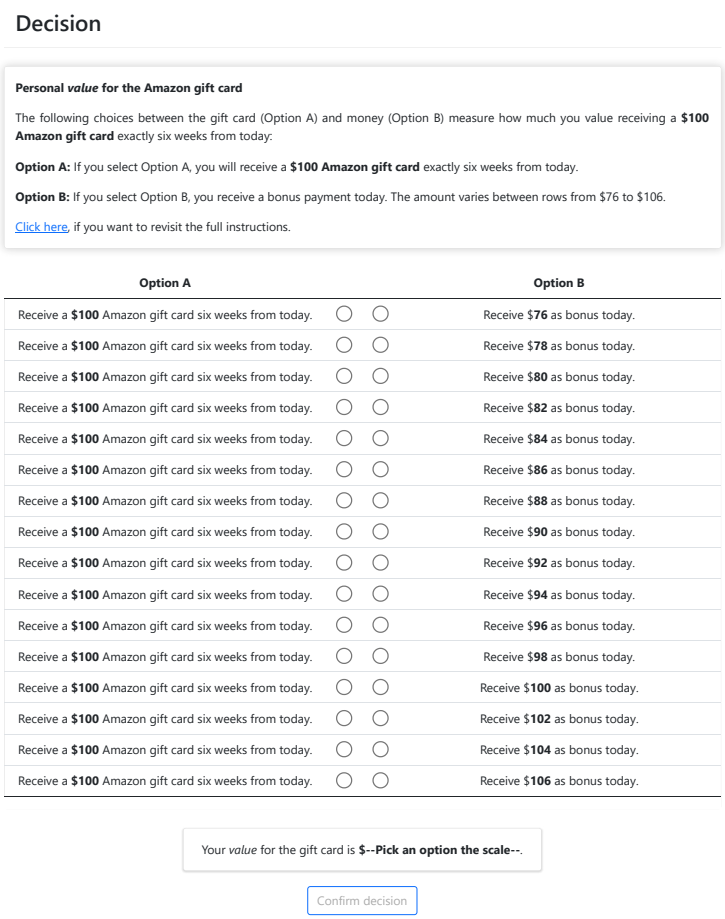


Figure G.12: Ingroup social and non-social screen 12

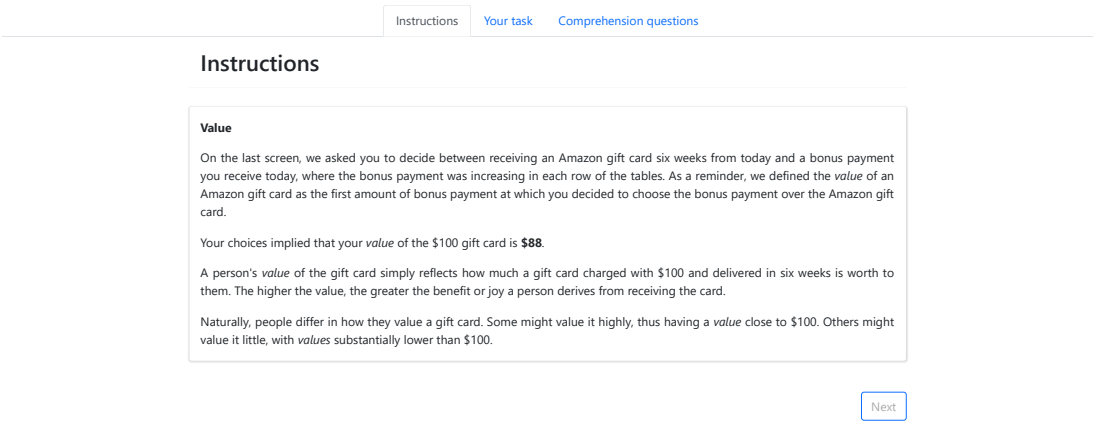


Figure G.13: Ingroup social and non-social screen 13

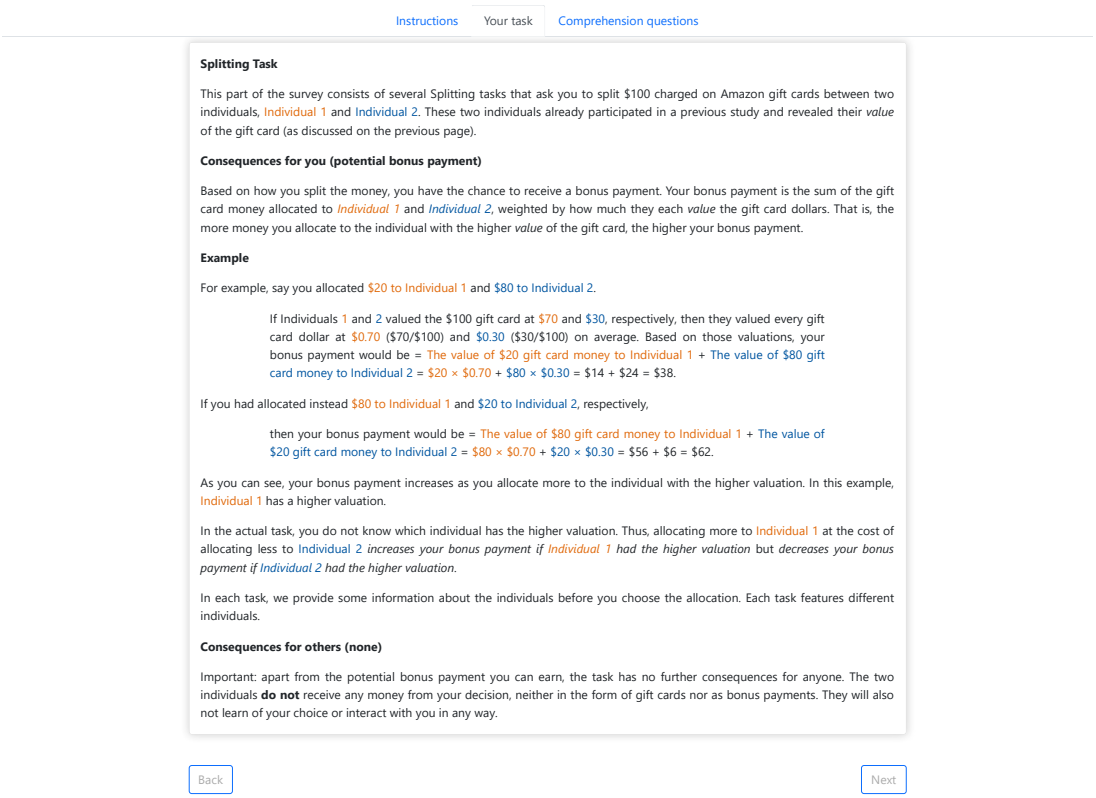


Figure G.14: Ingroup social and non-social screen 14

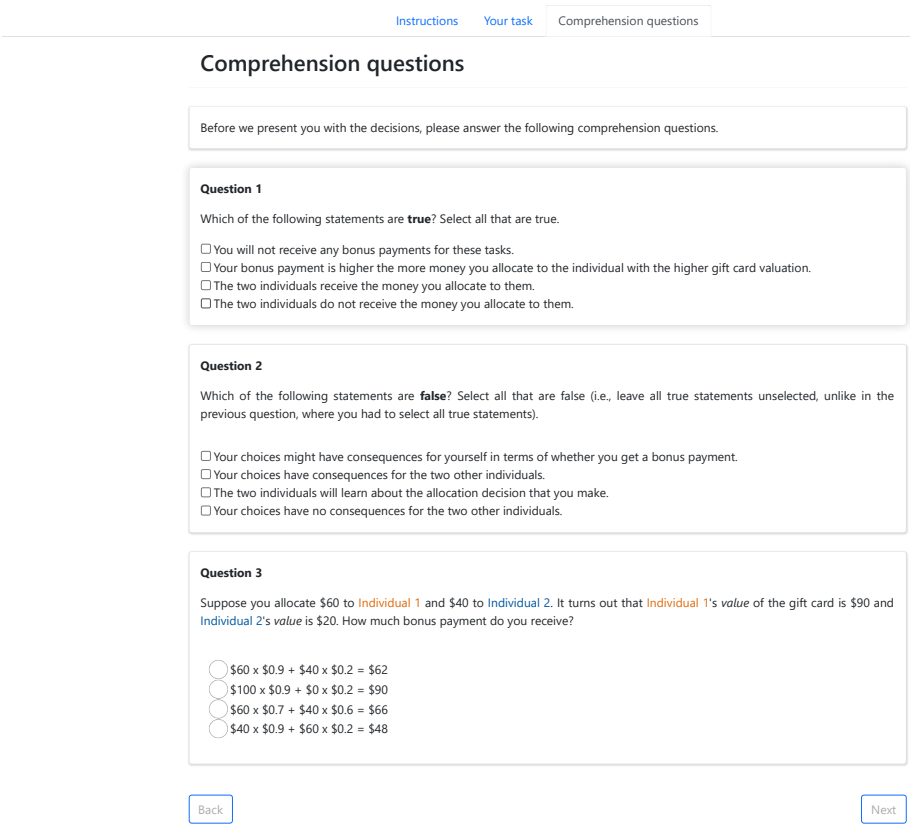
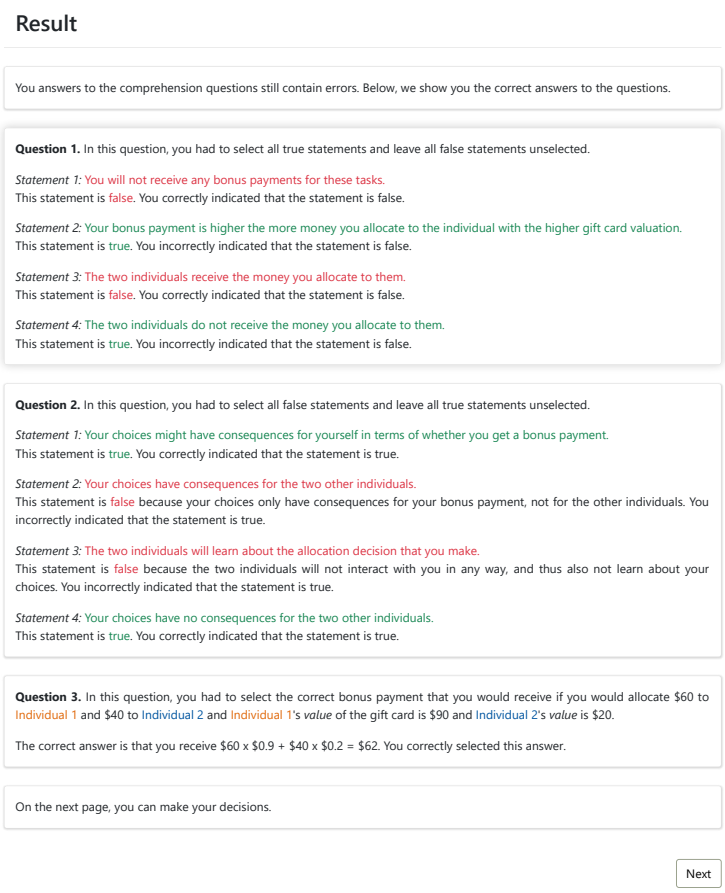


Figure G.15: Ingroup social and non-social screen 15



Result

You answers to the comprehension questions still contain errors. Below, we show you the correct answers to the questions.

Question 1. In this question, you had to select all true statements and leave all false statements unselected.

Statement 1: You will not receive any bonus payments for these tasks.
This statement is false. You correctly indicated that the statement is false.

Statement 2: Your bonus payment is higher the more money you allocate to the individual with the higher gift card valuation.
This statement is true. You incorrectly indicated that the statement is false.

Statement 3: The two individuals receive the money you allocate to them.
This statement is false. You correctly indicated that the statement is false.

Statement 4: The two individuals do not receive the money you allocate to them.
This statement is true. You incorrectly indicated that the statement is false.

Question 2. In this question, you had to select all false statements and leave all true statements unselected.

Statement 1: Your choices might have consequences for yourself in terms of whether you get a bonus payment.
This statement is true. You correctly indicated that the statement is true.

Statement 2: Your choices have consequences for the two other individuals.
This statement is false because your choices only have consequences for your bonus payment, not for the other individuals. You incorrectly indicated that the statement is true.

Statement 3: The two individuals will learn about the allocation decision that you make.
This statement is false because the two individuals will not interact with you in any way, and thus also not learn about your choices. You incorrectly indicated that the statement is true.

Statement 4: Your choices have no consequences for the two other individuals.
This statement is true. You correctly indicated that the statement is true.

Question 3. In this question, you had to select the correct bonus payment that you would receive if you would allocate $60 to Individual 1 and $40 to Individual 2 and Individual 1's *value* of the gift card is $90 and Individual 2's *value* is $20.

The correct answer is that you receive $60 x $0.9 + $40 x $0.2 = $62. You correctly selected this answer.

On the next page, you can make your decisions.

Next

Figure G.16: Ingroup social and non-social screen 16

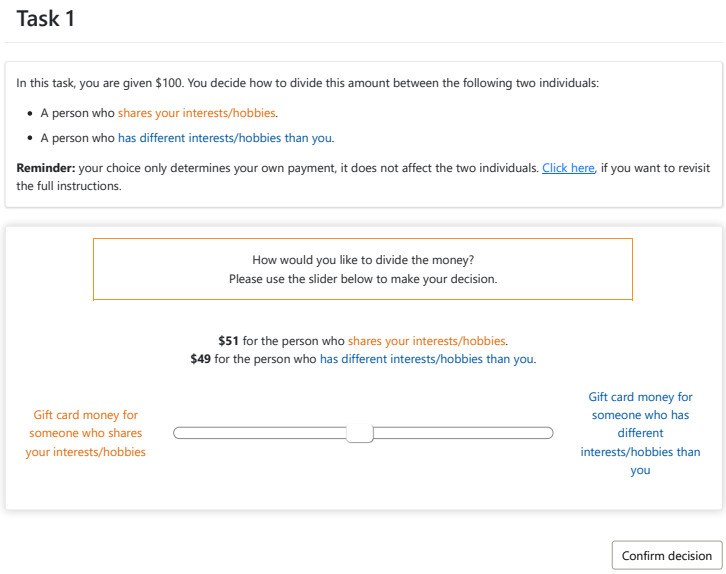


Figure G.17: Ingroup social and non-social screen 17

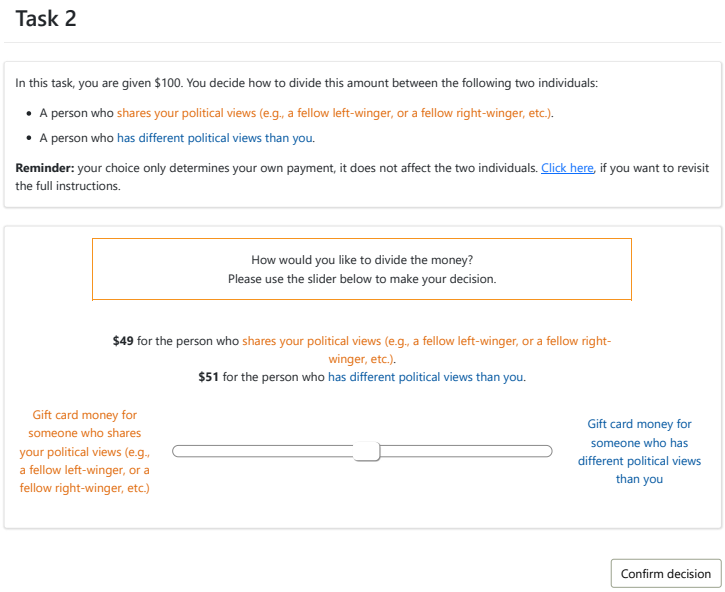
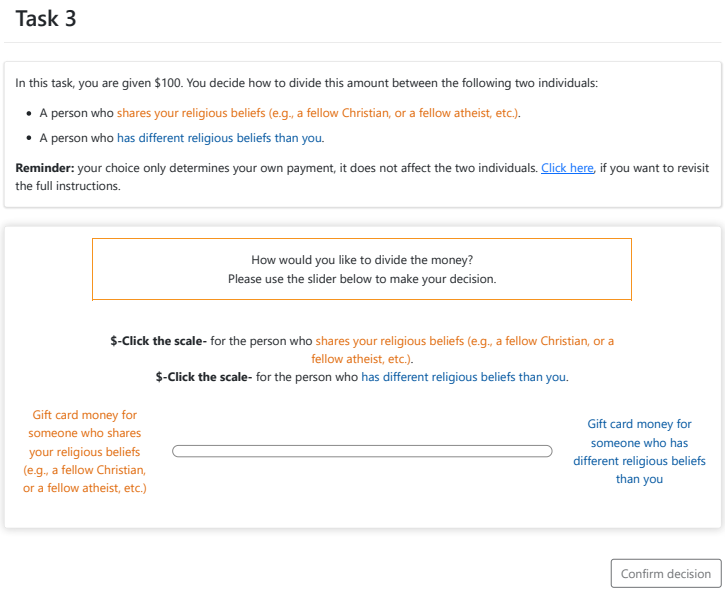


Figure G.18: Ingroup social and non-social screen 18



G.1.2 Ingroup info ingroup and Ingroup info outgroup screens

Figure G.19: Ingroup info ingroup and Ingroup info outgroup screen 1

Figure G.20: Ingroup info ingroup and Ingroup info outgroup screen 2

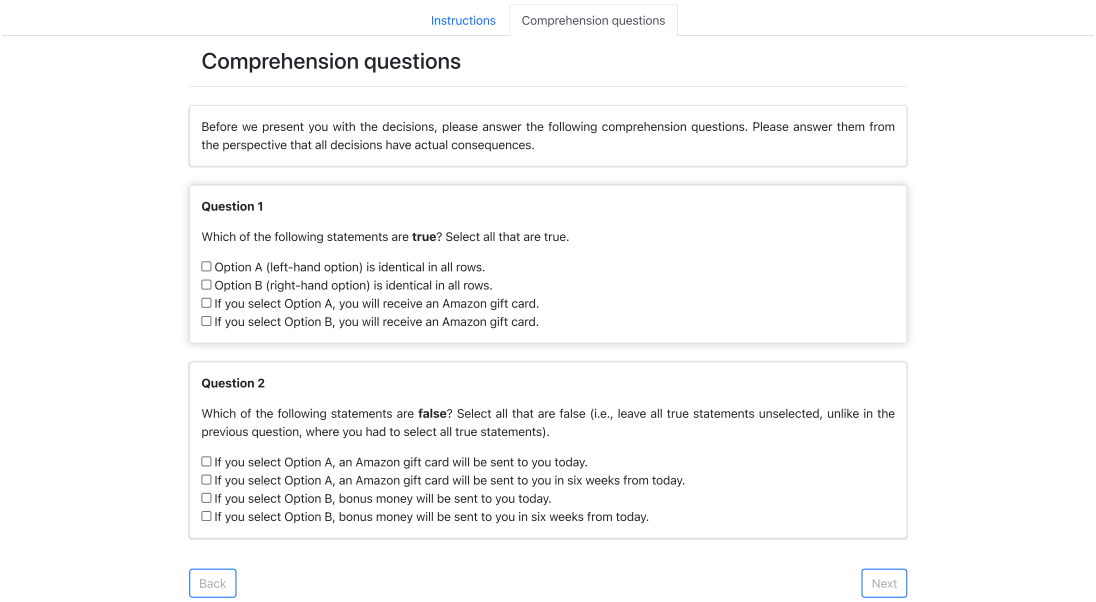


Figure G.21: Ingroup info ingroup and Ingroup info outgroup screen 3

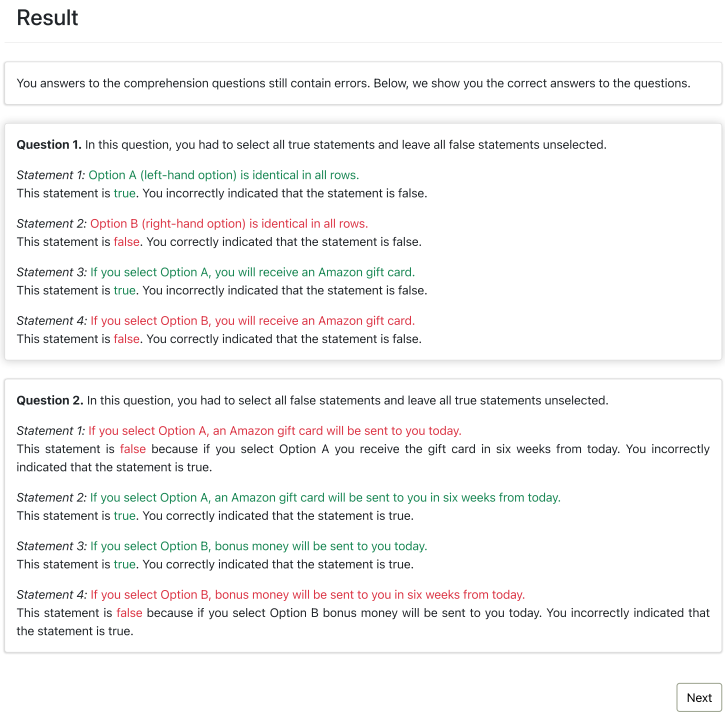


Figure G.22: Ingroup info ingroup and Ingroup info outgroup screen 4

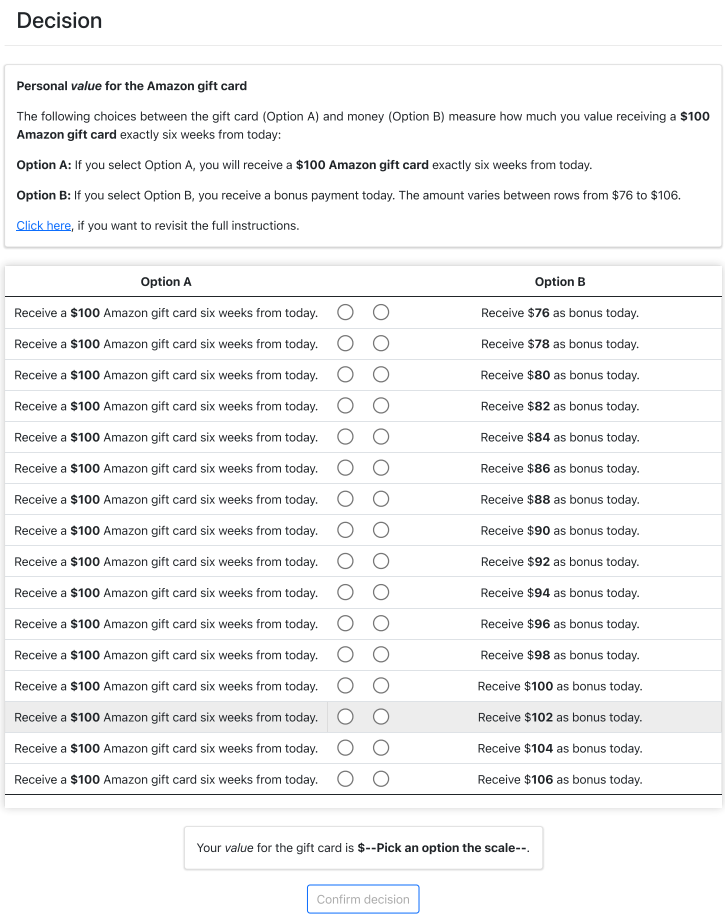


Figure G.23: Ingroup info ingroup and Ingroup info outgroup screen 5

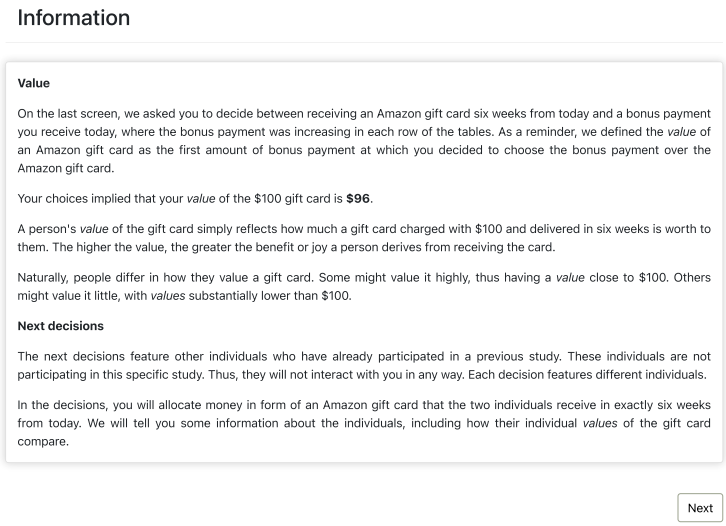


Figure G.24: Ingroup info ingroup and Ingroup info outgroup screen 6

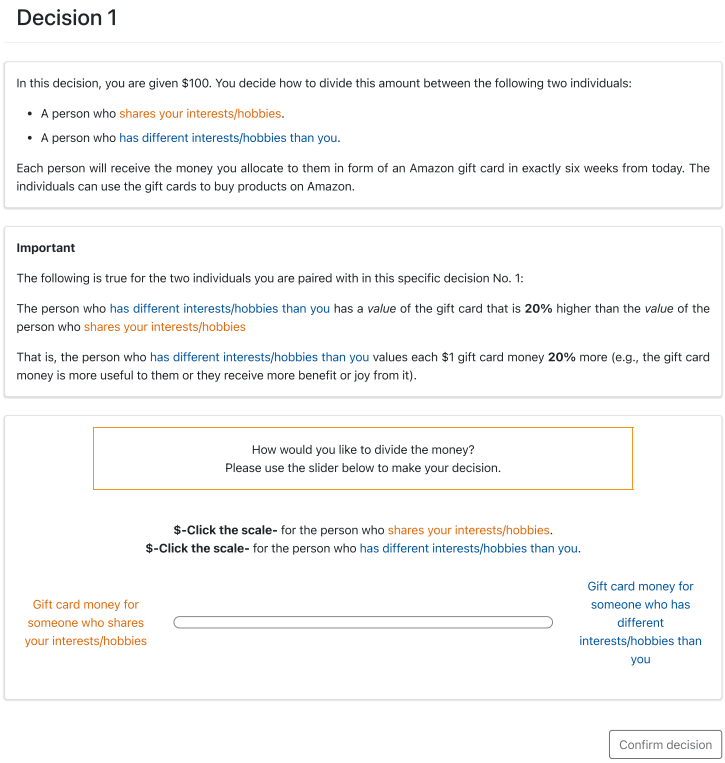


Figure G.25: Ingroup info ingroup and Ingroup info outgroup screen 7

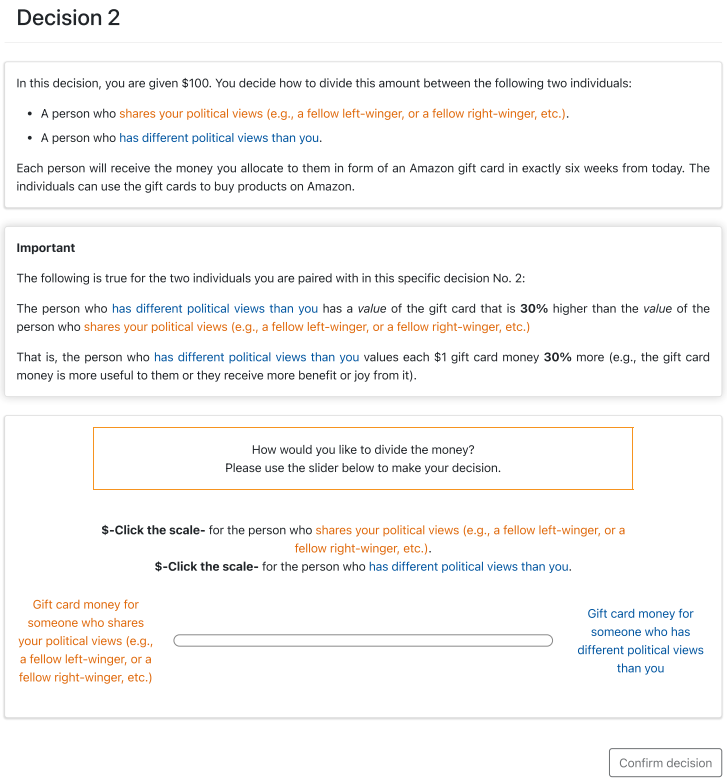


Figure G.26: Ingroup info ingroup and Ingroup info outgroup screen 8

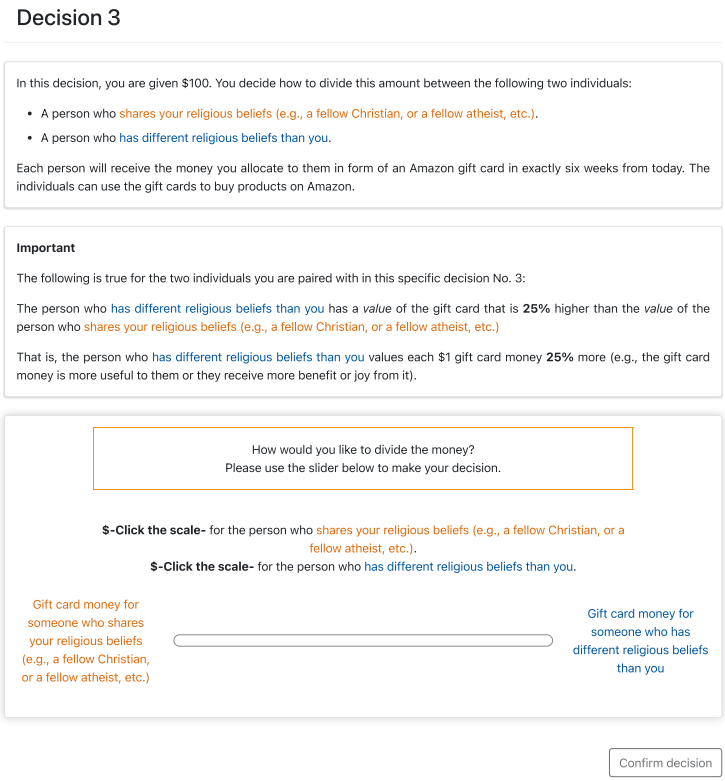


Figure G.27: Ingroup info ingroup and Ingroup info outgroup screen 9

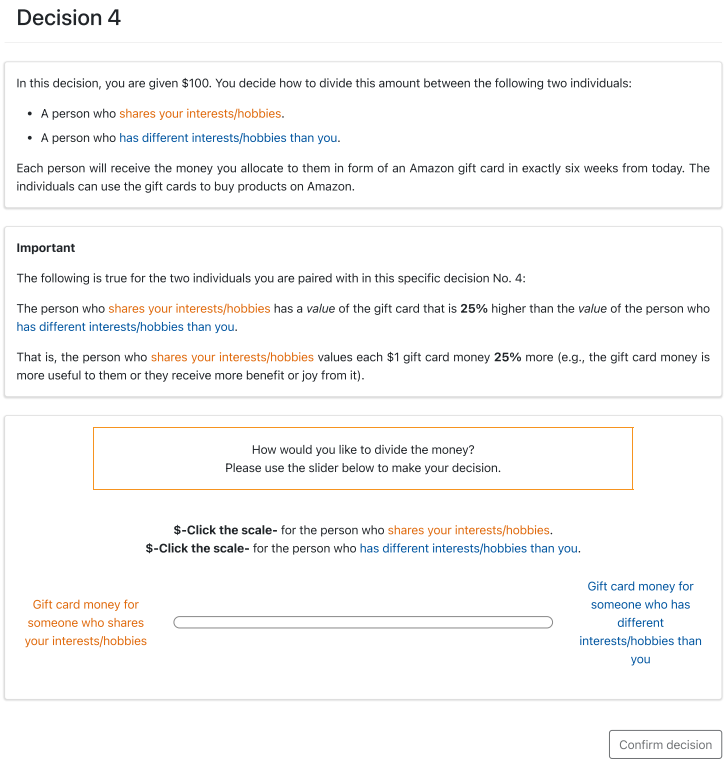


Figure G.28: Ingroup info ingroup and Ingroup info outgroup screen 10

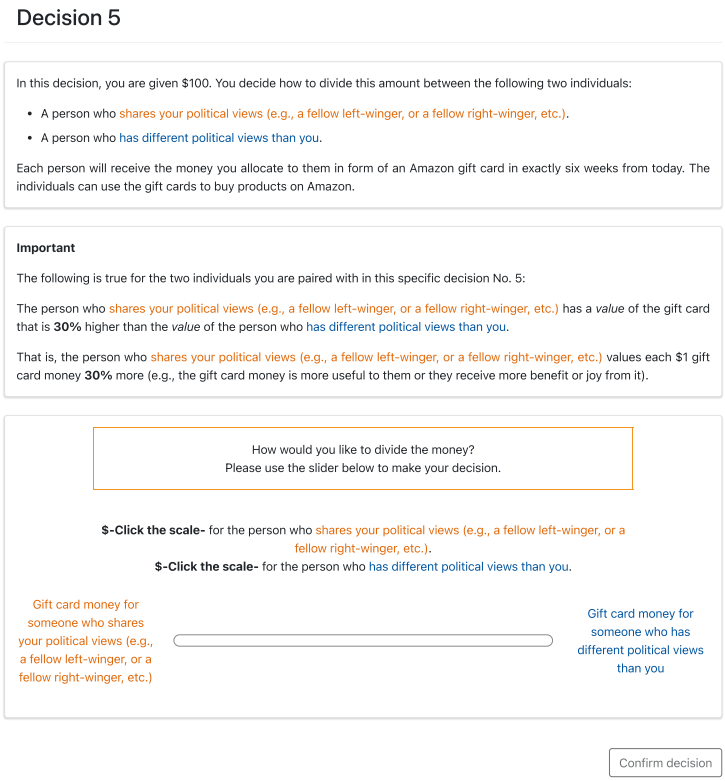
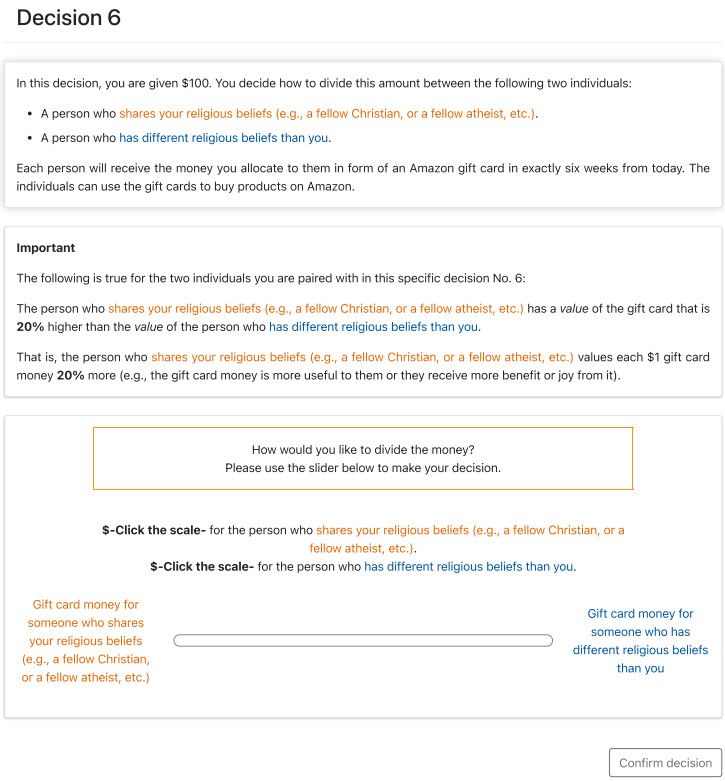


Figure G.29: Ingroup info ingroup and Ingroup info outgroup screen 11



G.1.3 Incentive ingroup and Incentive outgroup screens

Figure G.30: Incentive ingroup and Incentive outgroup screen 1

Figure G.31: Incentive ingroup and Incentive outgroup screen 2

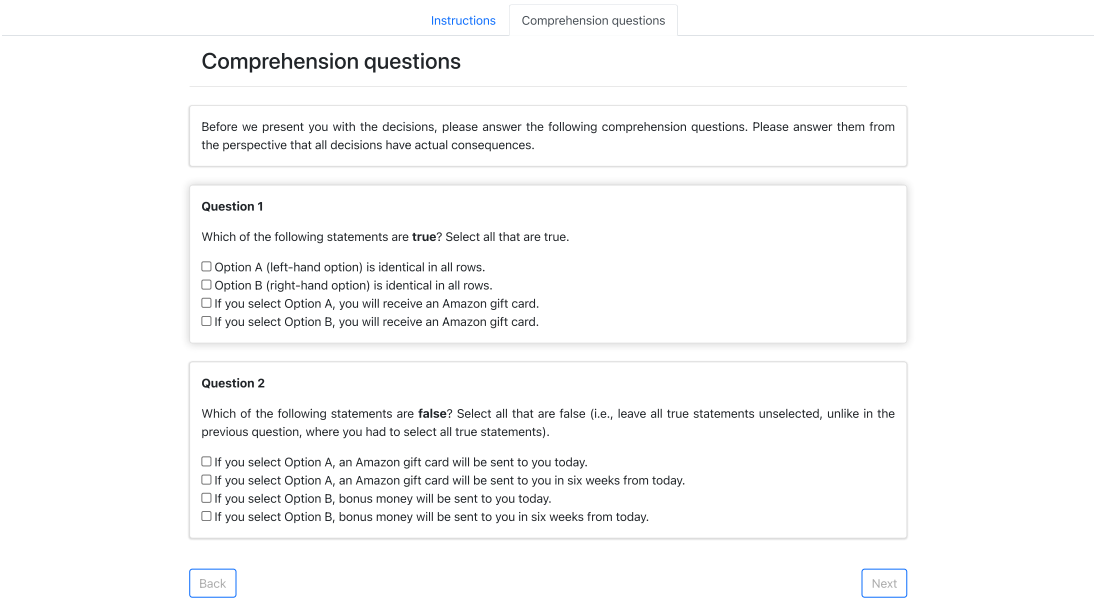


Figure G.32: Incentive ingroup and Incentive outgroup screen 3

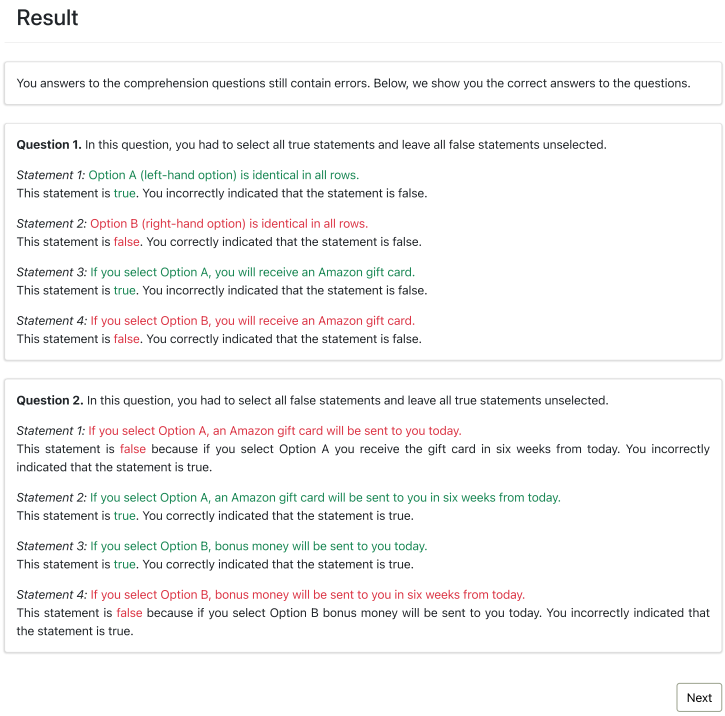


Figure G.33: Incentive ingroup and Incentive outgroup screen 4

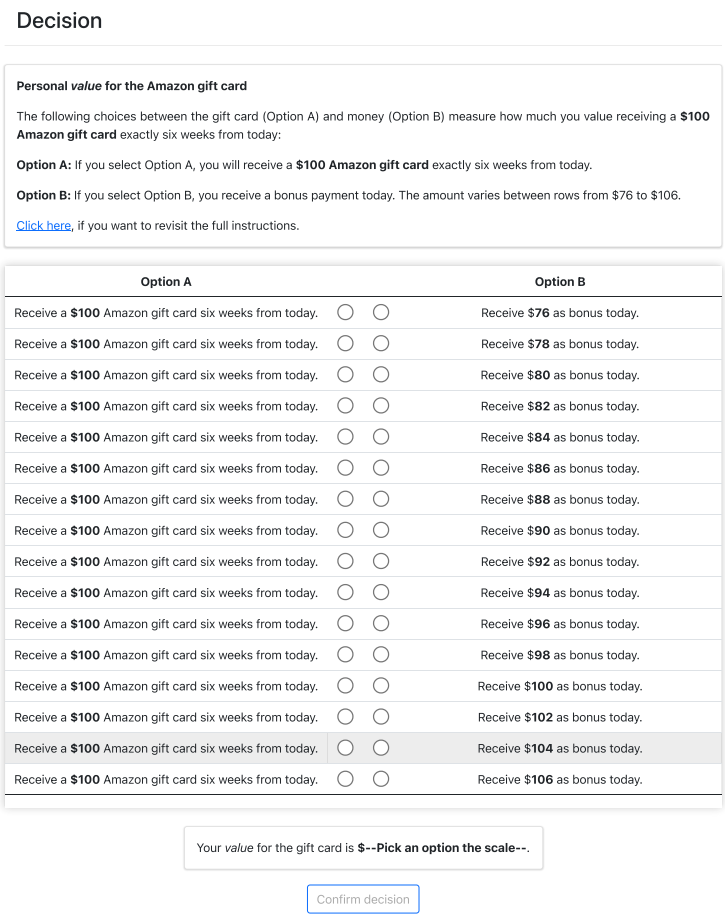


Figure G.34: Incentive ingroup and Incentive outgroup screen 5

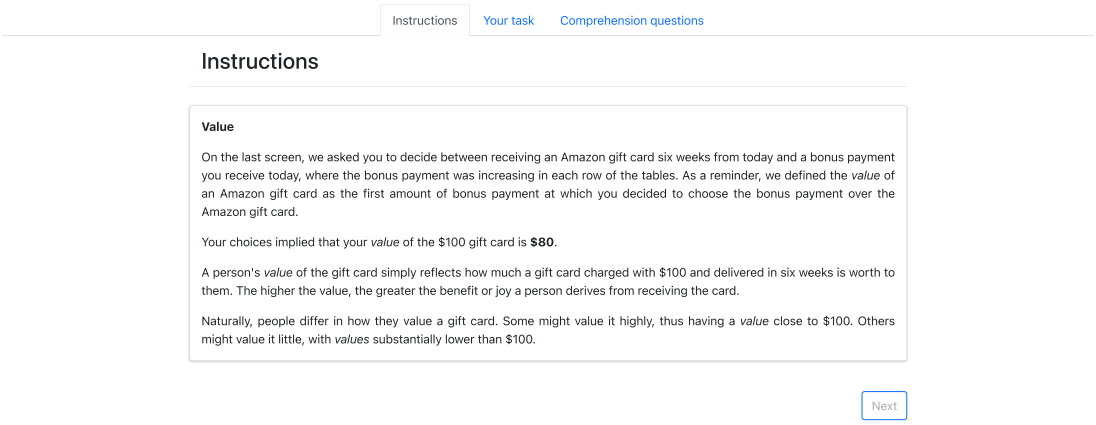


Figure G.35: Incentive ingroup and Incentive outgroup screen 6

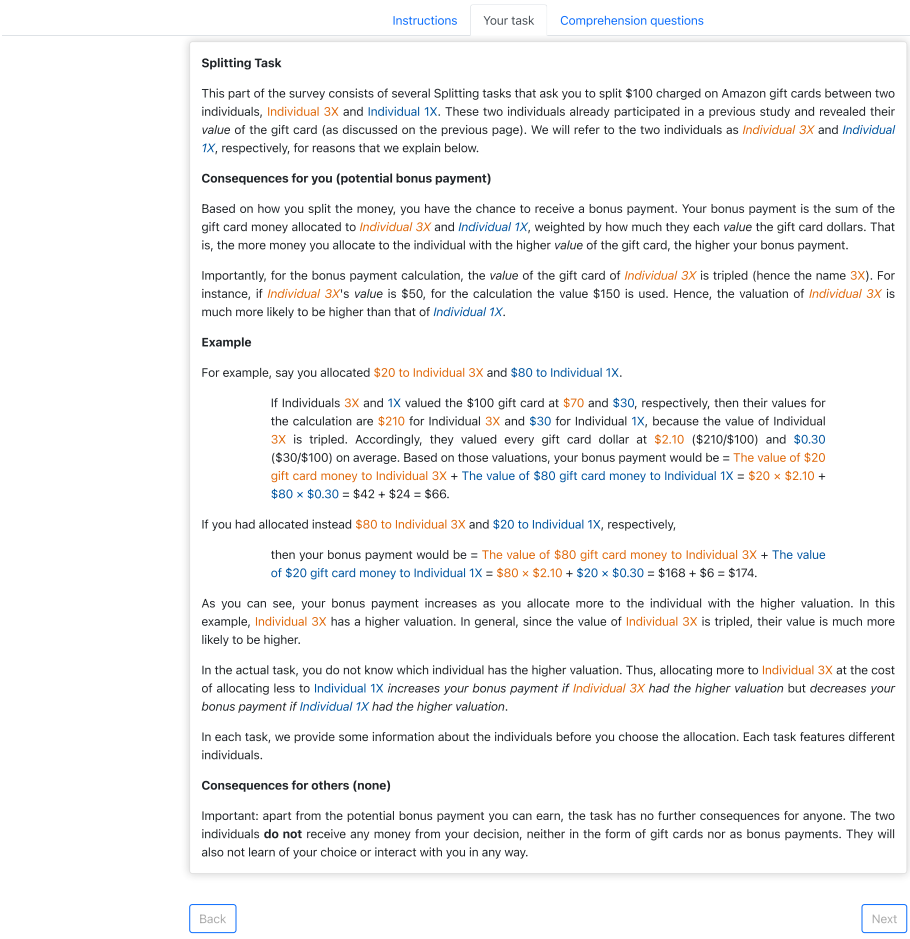


Figure G.36: Incentive ingroup and Incentive outgroup screen 7

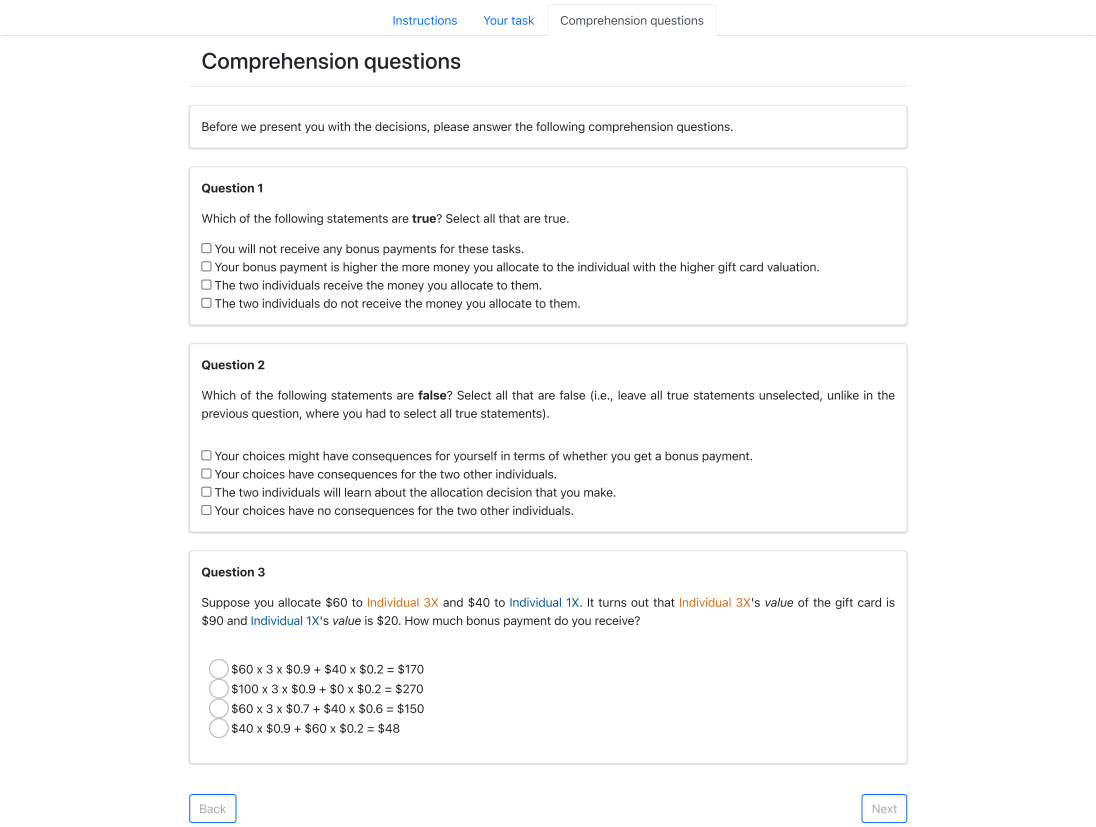


Figure G.37: Incentive ingroup and Incentive outgroup screen 8

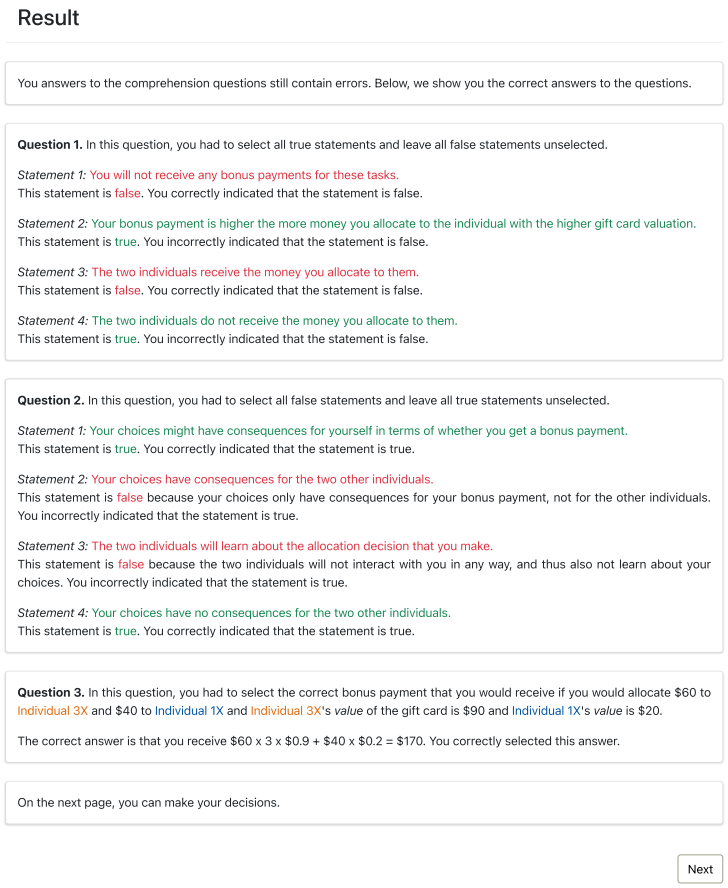


Figure G.38: Incentive ingroup and Incentive outgroup screen 9

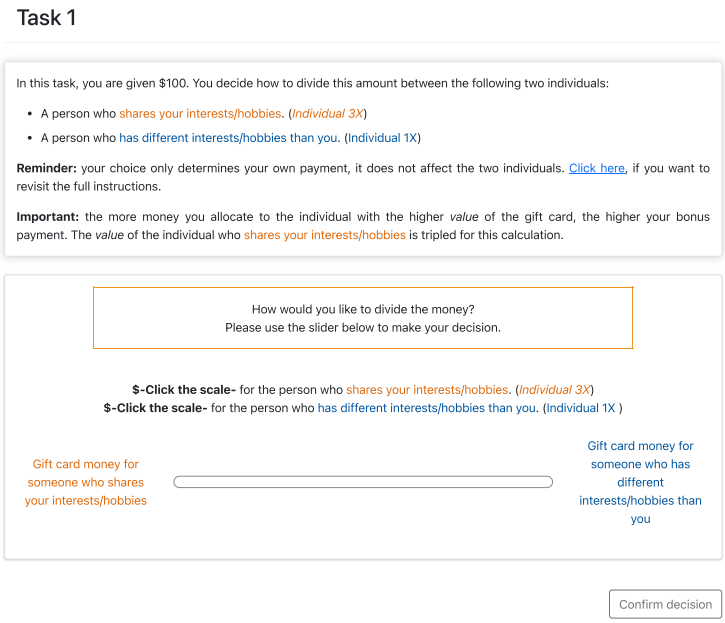


Figure G.39: Incentive ingroup and Incentive outgroup screen 10

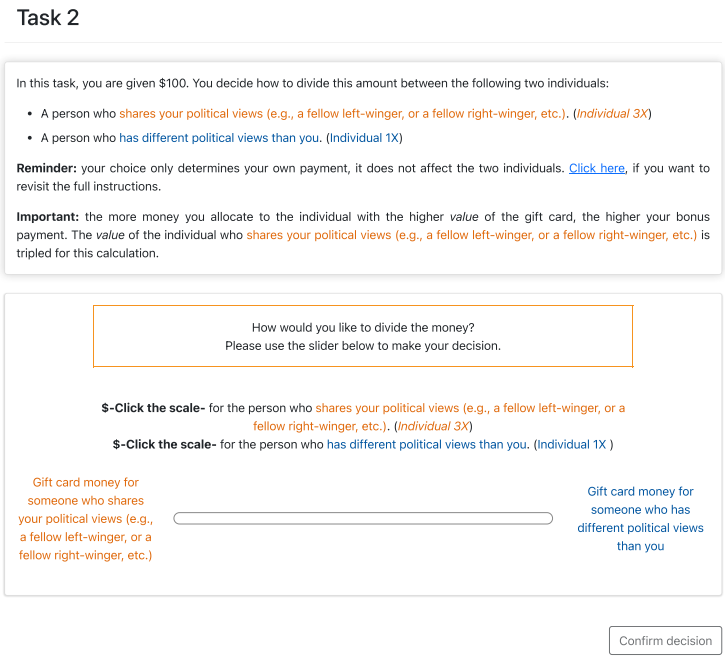


Figure G.40: Incentive ingroup and Incentive outgroup screen 11

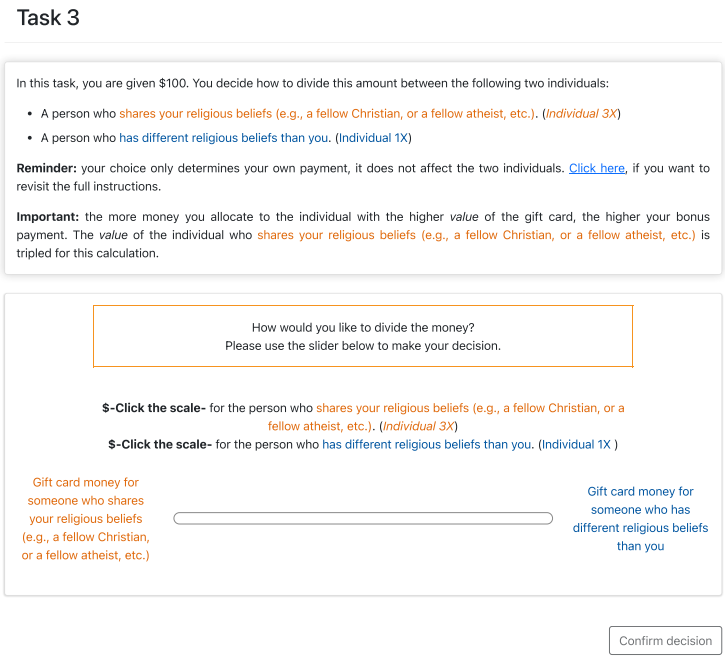


Figure G.41: Incentive ingroup and Incentive outgroup screen 12

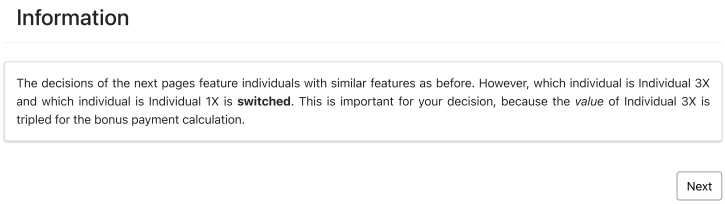


Figure G.42: Incentive ingroup and Incentive outgroup screen 13

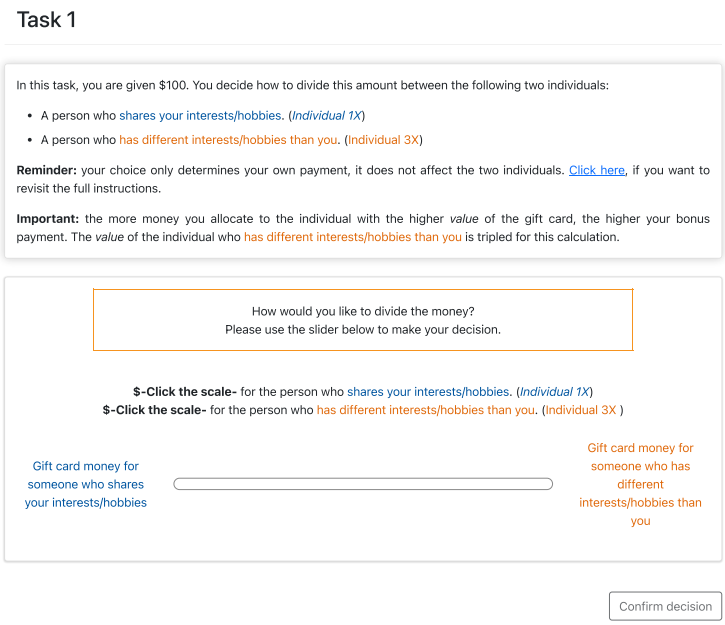


Figure G.43: Incentive ingroup and Incentive outgroup screen 14

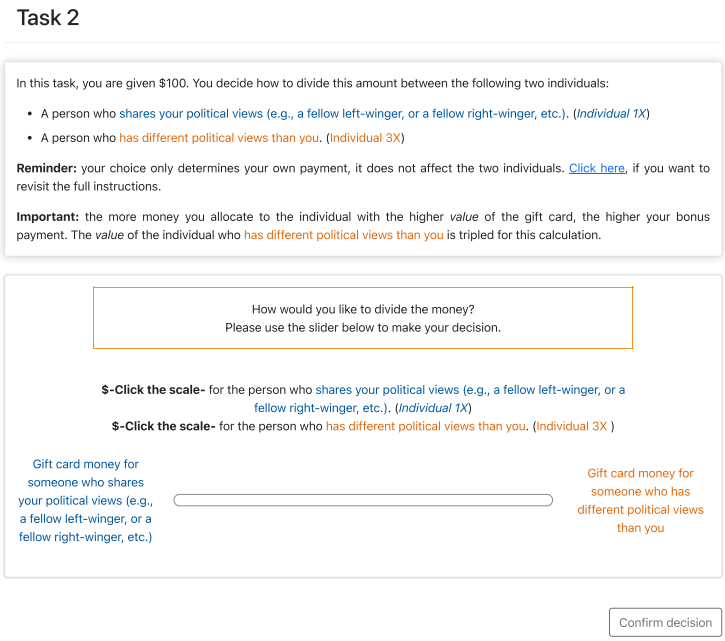
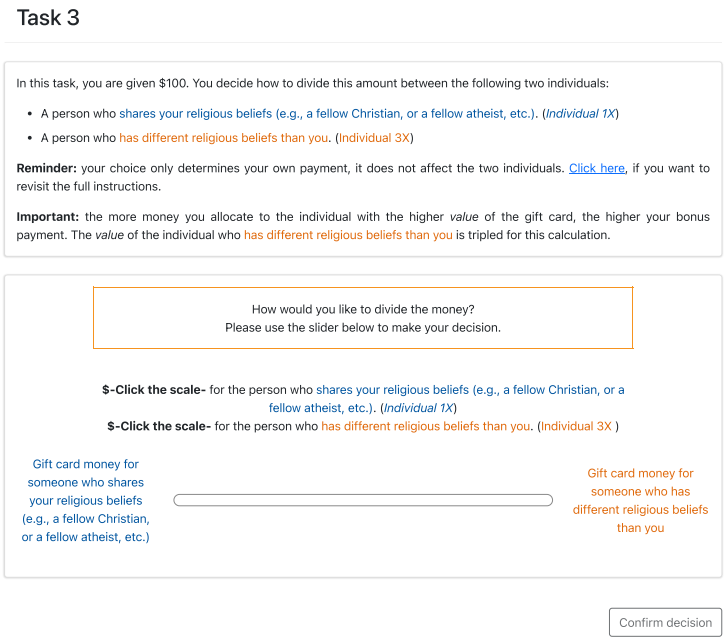


Figure G.44: Incentive ingroup and Incentive outgroup screen 15



G.1.4 Ingroup non-social minimum screens

Figure G.45: Ingroup non-social minimum screen 1

Instructions | Comprehension questions

Instructions

In this part of the study, we want to know how much you value an Amazon gift card received six weeks from today. For this, we ask you to choose repeatedly between two options, **Option A** (the gift card) and **Option B** (money today), arranged in a table. Thus, each row of the table is a different choice.

Option A

Option A (left-hand option) is identical in all rows. If you select Option A, you will receive an Amazon gift card loaded with a pre-specified amount of money exactly six weeks from today. That is, in six weeks, we will send you the gift card code via a Prolific message. You can then use the gift card to buy any products on Amazon.

Option B

Option B (right-hand option) varies between rows. If you select Option B, you will receive the amount specified in the row as bonus payment today. The amount you receive under Option B increases as you move down the rows of the table (see table below).

Example

Below, you see an example of a table. For instance, the first row of the table asks you to choose between "Receive a $100 Amazon gift card six weeks from today" (Option A) and "Receive $90 as bonus today" (Option B). Thus, the left option is a gift card payable on a future date, and the right option is bonus money paid today. If you choose the left option (Option A), it means that you prefer the former over the latter. If you choose the right option (Option B), it means that you prefer the latter instead.

Option A			Option B
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**90** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**92** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**94** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**96** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**98** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**100** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**102** as bonus today.
Receive a $100 Amazon gift card six weeks from today.	○	○	Receive $**104** as bonus today.

Auto-completion

The table auto-completes your choices, so you don't have to click through all of the rows. If you select Option A in any row, we assume you will also prefer Option A in all rows *above* that row and auto-complete accordingly. If you select Option B in any one row, we assume that you will also prefer Option B in all rows *below* that row. You can revise your choice by selecting another Option in a different row.

Gift card *value*

We define your personal *value* of an Amazon gift card as the first amount of bonus payment at which you decided to choose the bonus payment over the Amazon gift card. For instance, if you select Option A over Option B when the bonus payment in Option B is less than $96 and pick Option B over Option A when the payment is $96 or more, your *value* of the gift card is $96.

Next

Figure G.46: Ingroup non-social minimum screen 2

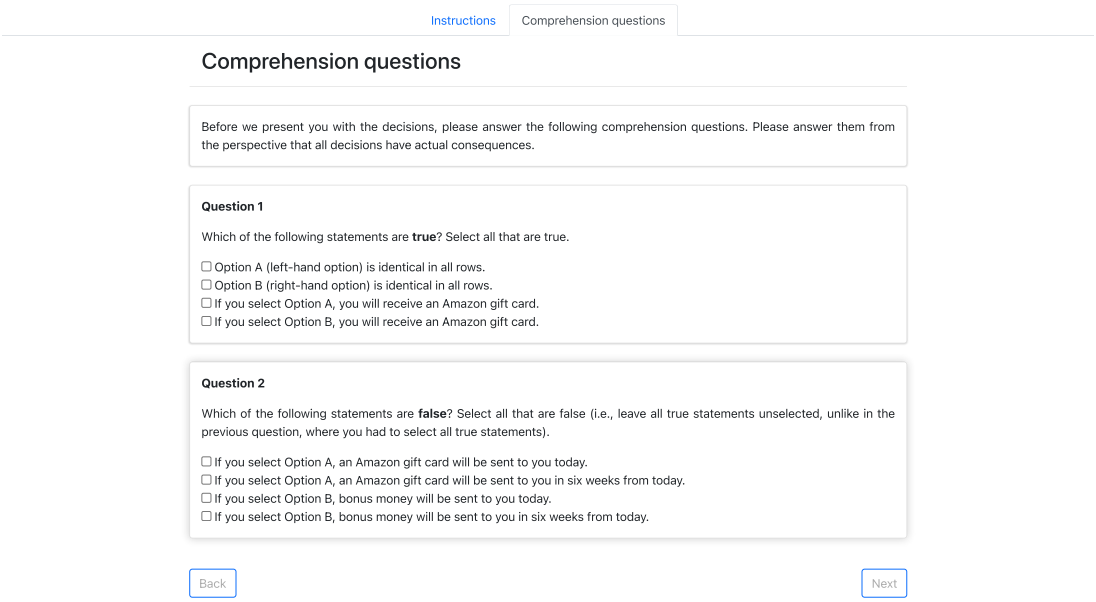


Figure G.47: Ingroup non-social minimum screen 3

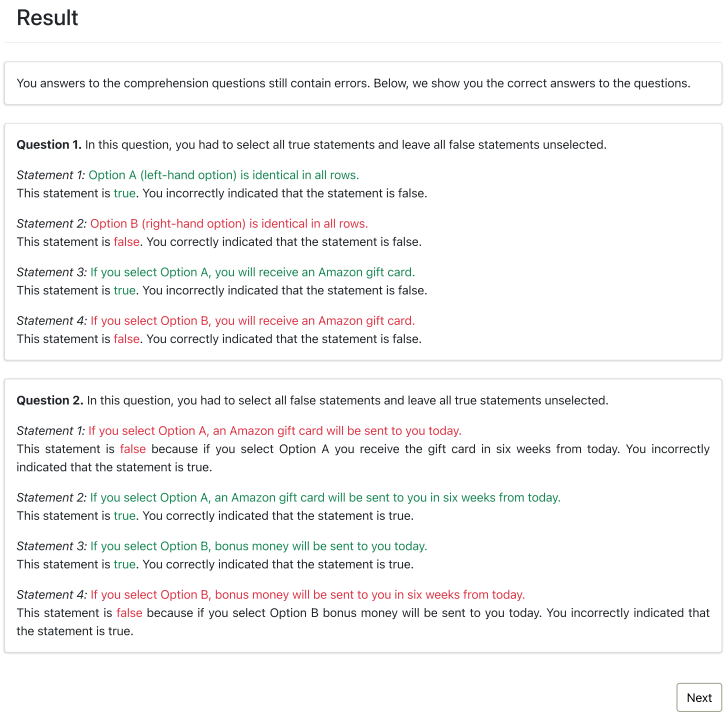


Figure G.48: Ingroup non-social minimum screen 4

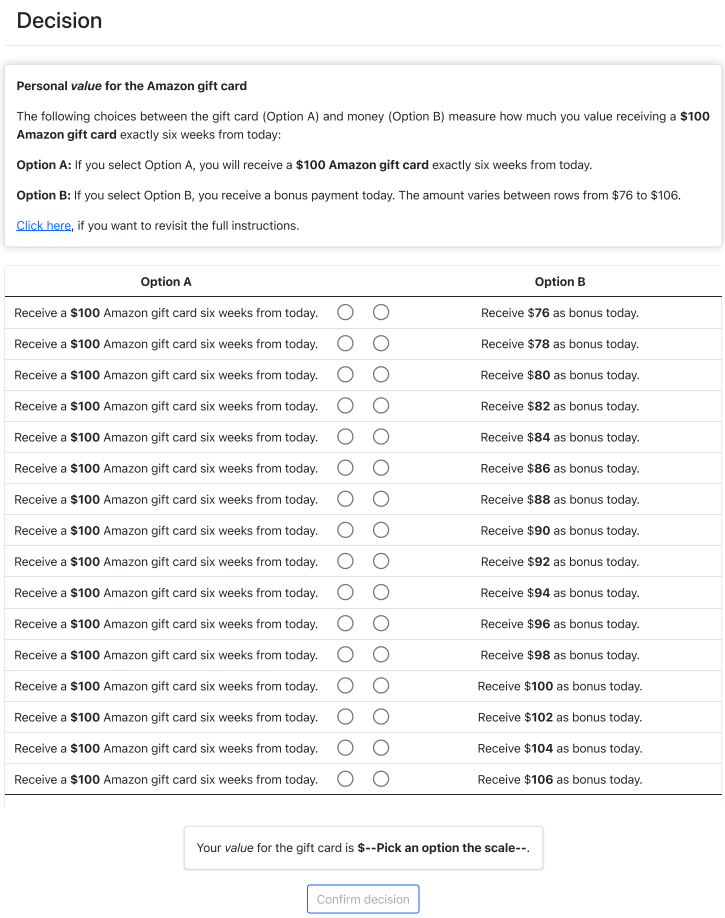


Figure G.49: Ingroup non-social minimum screen 5

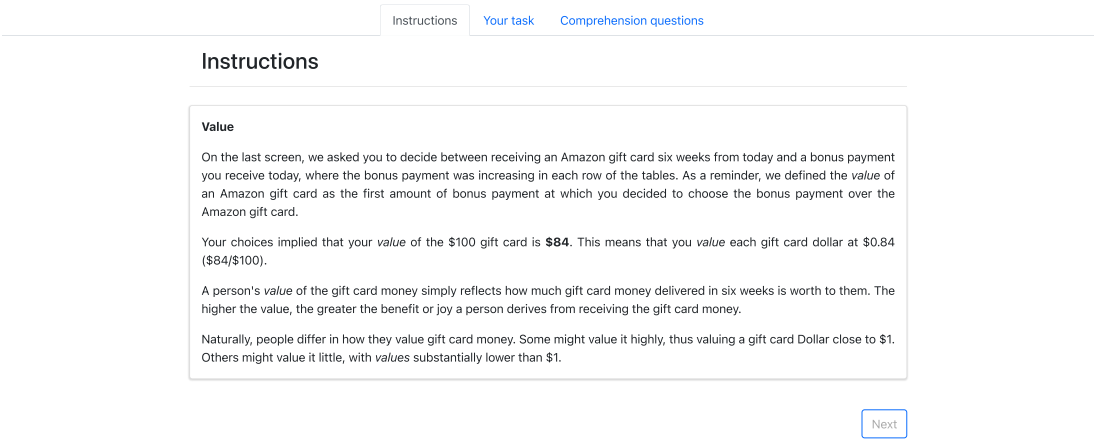


Figure G.50: Ingroup non-social minimum screen 6

Instructions | Your task | Comprehension questions

Splitting Task

This part of the survey consists of several Splitting tasks that ask you to split $100 charged on Amazon gift cards between two individuals, Individual 1 and Individual 2. These two individuals already participated in a previous study and revealed the *value* they receive from each gift card dollar (as discussed on the previous page).

Consequences for you (potential bonus payment)

Based on how you split the $100, you have the chance to receive a bonus payment. Your bonus payment depends on two variables, *totalvalue1* and *totalvalue2*, calculated for *Individual 1* and *Individual 2*.

! *The more you equate the total values for the two individuals, the higher is your bonus.*

You can think of the totalvalue as how much joy or benefit an individual would get from receiving the allocated amount of money. The benefit increases with more gift card money and with how much the individual values gift card money in general.

> We define *totalvalue1* as the gift card dollar you allocate to *Individual 1* multiplied by how much they value each gift card dollar. Say you allocated $40 to *Individual 1* and they *value* each gift card dollar at $0.60. Then *totalvalue1* = 40 × 0.6 = 24.
>
> Similarly, we define *totalvalue2* as the gift card dollar you allocate to *Individual 2* multiplied by how much they value each gift card dollar.

⇒ Your bonus payment is then equal to the smaller of the two amounts, *totalvalue1* or *totalvalue2*.

In other words, if *totalvalue1* is smaller than *totalvalue2*, you receive *totalvalue1* as bonus payment. If *totalvalue2* is smaller, you receive *totalvalue2* as bonus payment.

This calculation has a simple interpretation: whenever there is inequality between *totalvalue1* and *totalvalue2* (one is big and the other is small), your bonus is small. Put differently, **the more equal *totalvalue1* and *totalvalue2***, the higher your bonus.

Example

You can always increase your bonus by giving more to the person who is worse off in terms of total value, thereby increasing equality.

For example, say you allocated $60 to Individual 1 and $40 to Individual 2.

> Suppose Individual 1 valued each gift card dollar at $0.50 and Individual 2 valued each gift card dollar at $0.60. Then, *totalvalue1* = 60 × 0.50 = 30 and *totalvalue2* = 40 × 0.60 = 24. Therefore, *totalvalue2* is the smaller one, because 24 is smaller than 30. Hence, your bonus payment would be *totalvalue1* = $24. You could have increased your bonus by giving more money to Individual 2.

Suppose Individuals 1 and 2 both valued each gift card dollar at $0.60. Say you allocated $60 to Individual 1 and $40 to Individual 2.

> Then, *totalvalue1* = 60 × 0.60 = 36 and *totalvalue2* = 40 × 0.60 = 24. Since *totalvalue2* is again smaller, your bonus payment would be *totalvalue2* = $24. Again, you could have increased your bonus by giving more money to Individual 2.

If you had allocated instead $50 to Individual 1 and $50 to Individual 2, respectively,

> Then, *totalvalue1* = 50 × 0.60 = 30 and *totalvalue2* = 50 × 0.60 = 30. Based on those valuations, your bonus payment would be = $30.

! *As you can see, your bonus payment increases as you decrease the inequality between totalvalue1 and totalvalue2.*

In the actual task, you do not know *totalvalue1* or *totalvalue2*. But you should make your choice so that the inequality between *totalvalue1* and *totalvalue2* is as small as possible.

In each task, we provide some information about the individuals before you choose the allocation. Each task features different individuals.

Consequences for others (none)

! Important: You have the chance to receive a bonus payment. The task has no further consequences for anyone. We are just interested in understanding how you equate total values.

The two individuals (1 and 2) already participated in a previous study and have been paid for their participation. Thus, their involvement is already over. This means they **do not** receive any money from your decision, neither in the form of gift cards nor as bonus payments. In particular, you do not send them any money. They will also not learn of your choice or interact with you in any way.

Back | Next

Figure G.51: Ingroup non-social minimum screen 7

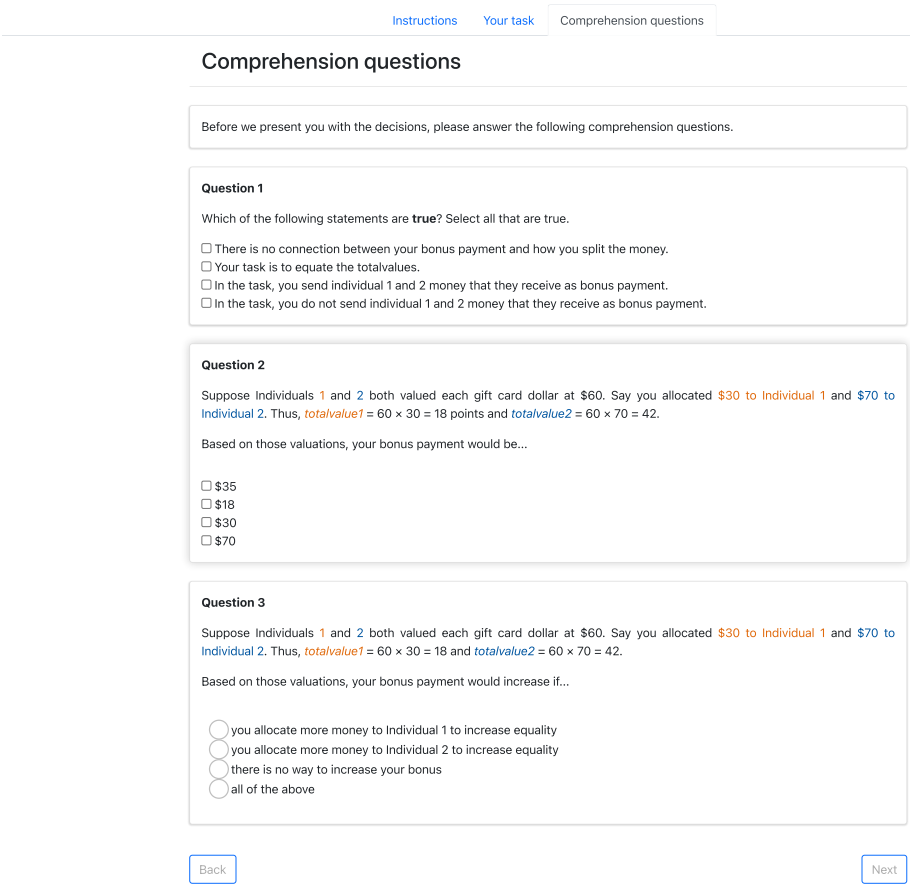


Figure G.52: Ingroup non-social minimum screen 8

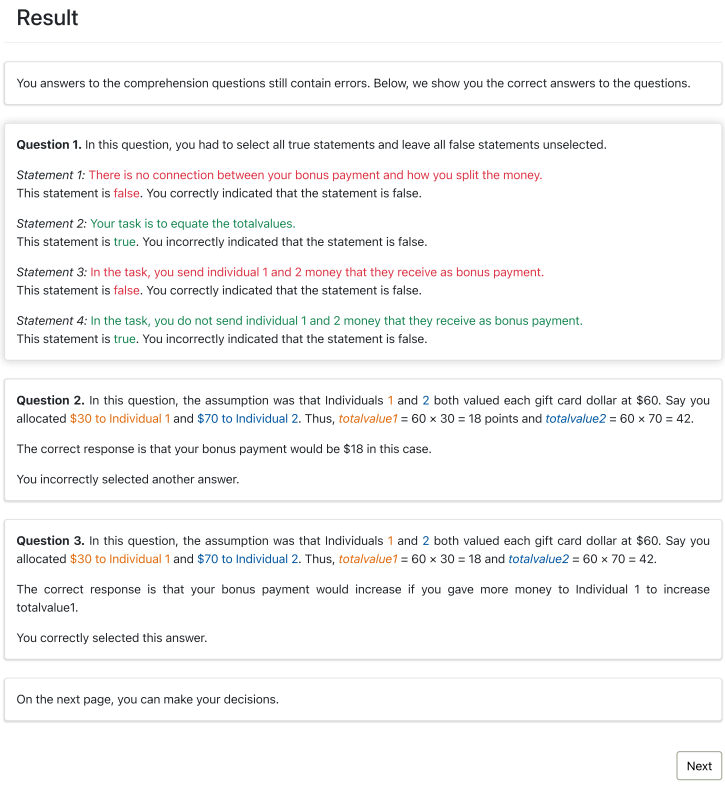


Figure G.53: Ingroup non-social minimum screen 9

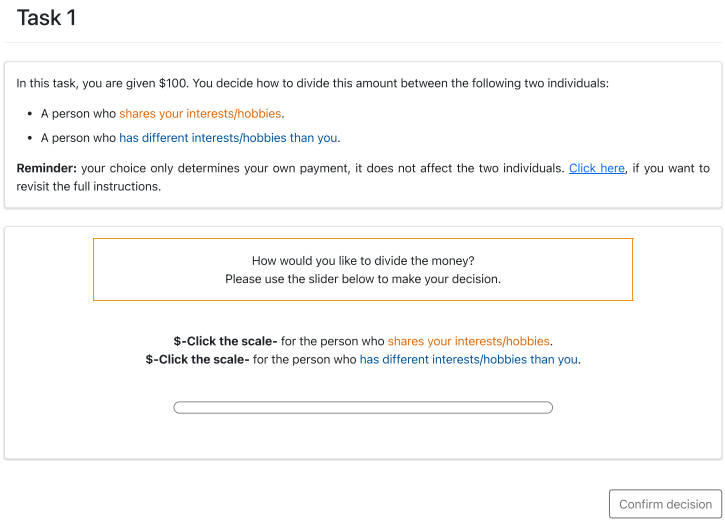


Figure G.54: Ingroup non-social minimum screen 10

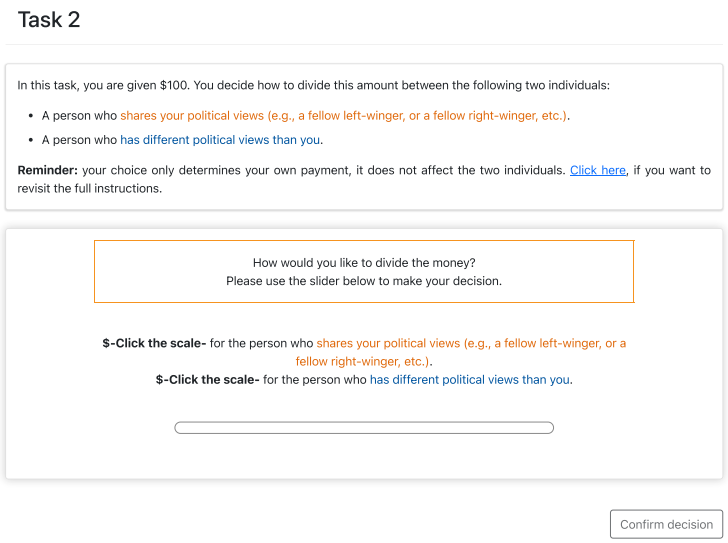
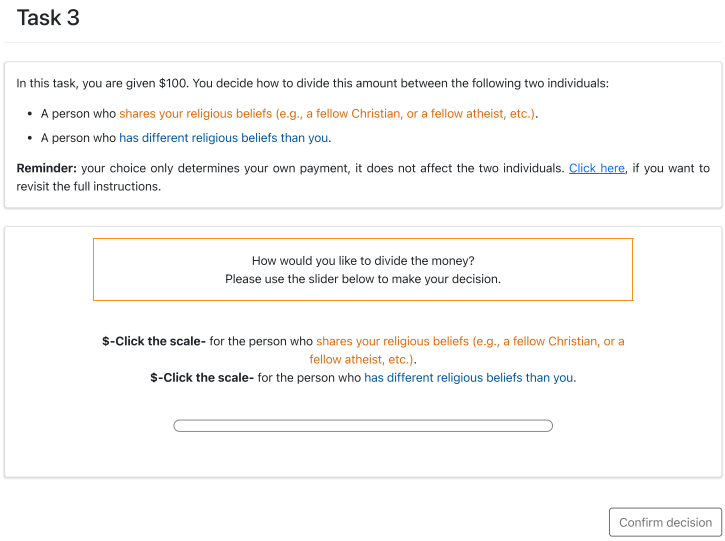


Figure G.55: Ingroup non-social minimum screen 11



G.2 Self versus other paradigm screens

G.2.1 Self social and non-social screens

Figure G.56: Self social and non-social screen 1

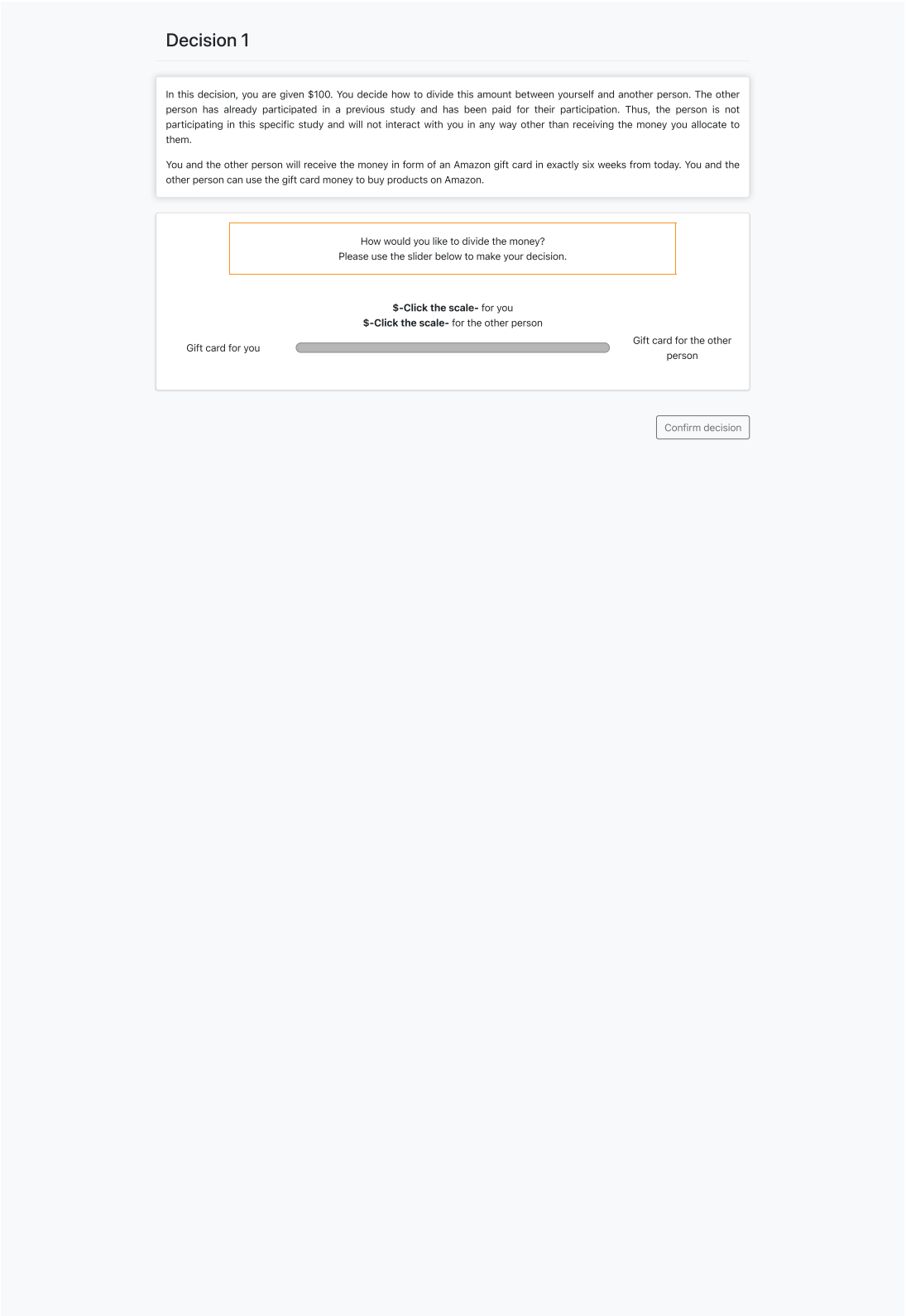


Figure G.57: Self social and non-social screen 2

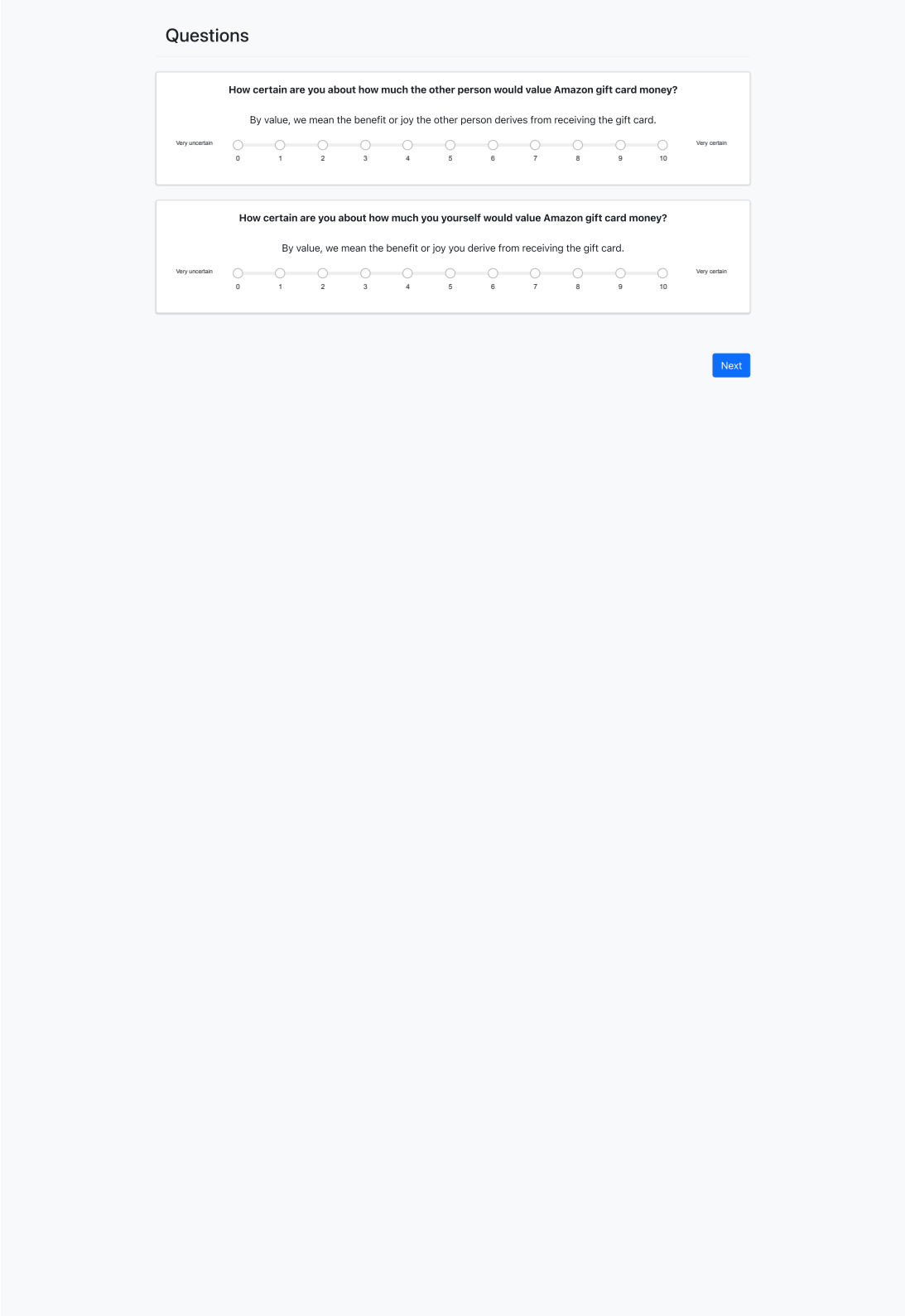


Figure G.58: Self social and non-social screen 3

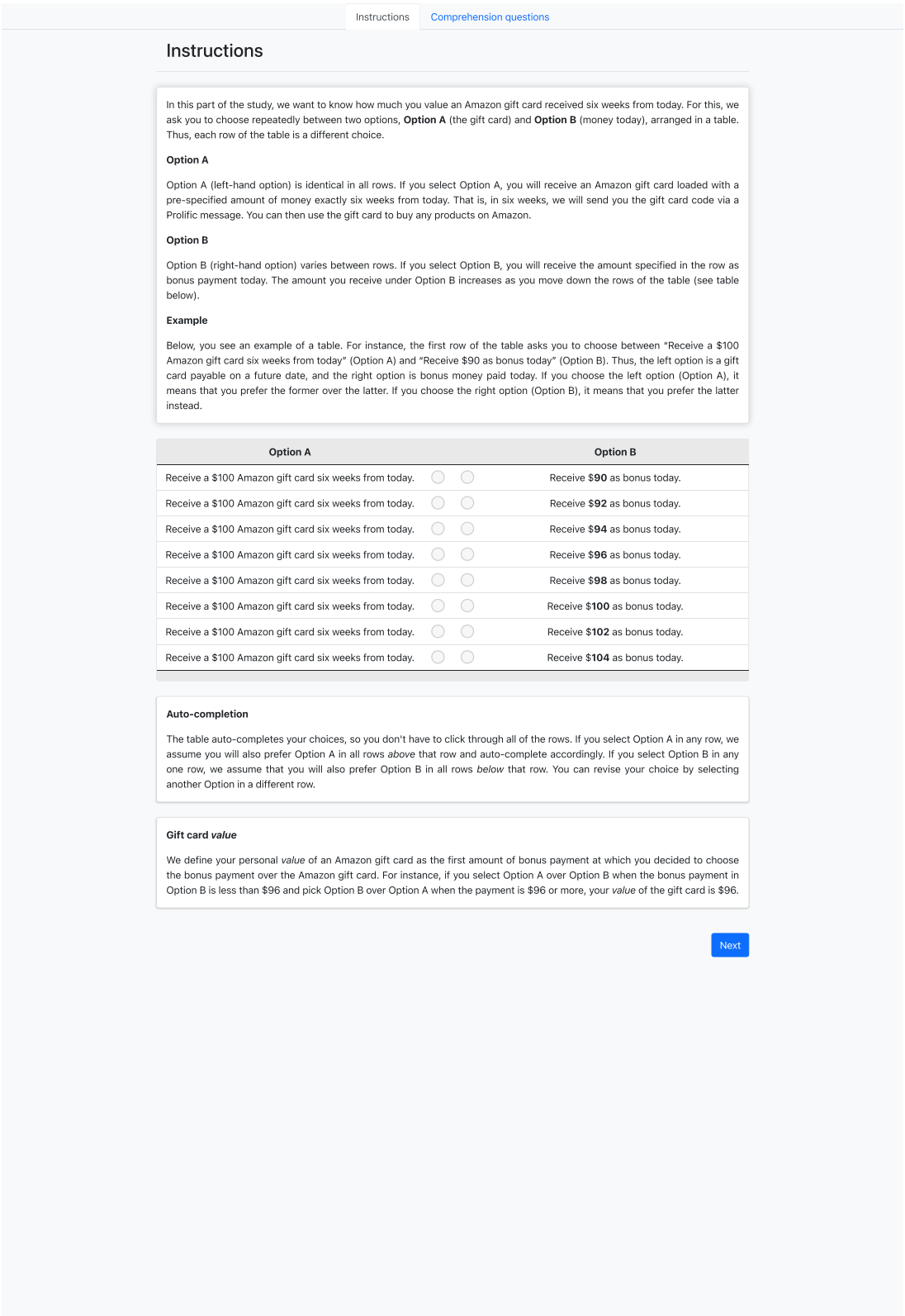


Figure G.59: Self social and non-social screen 4

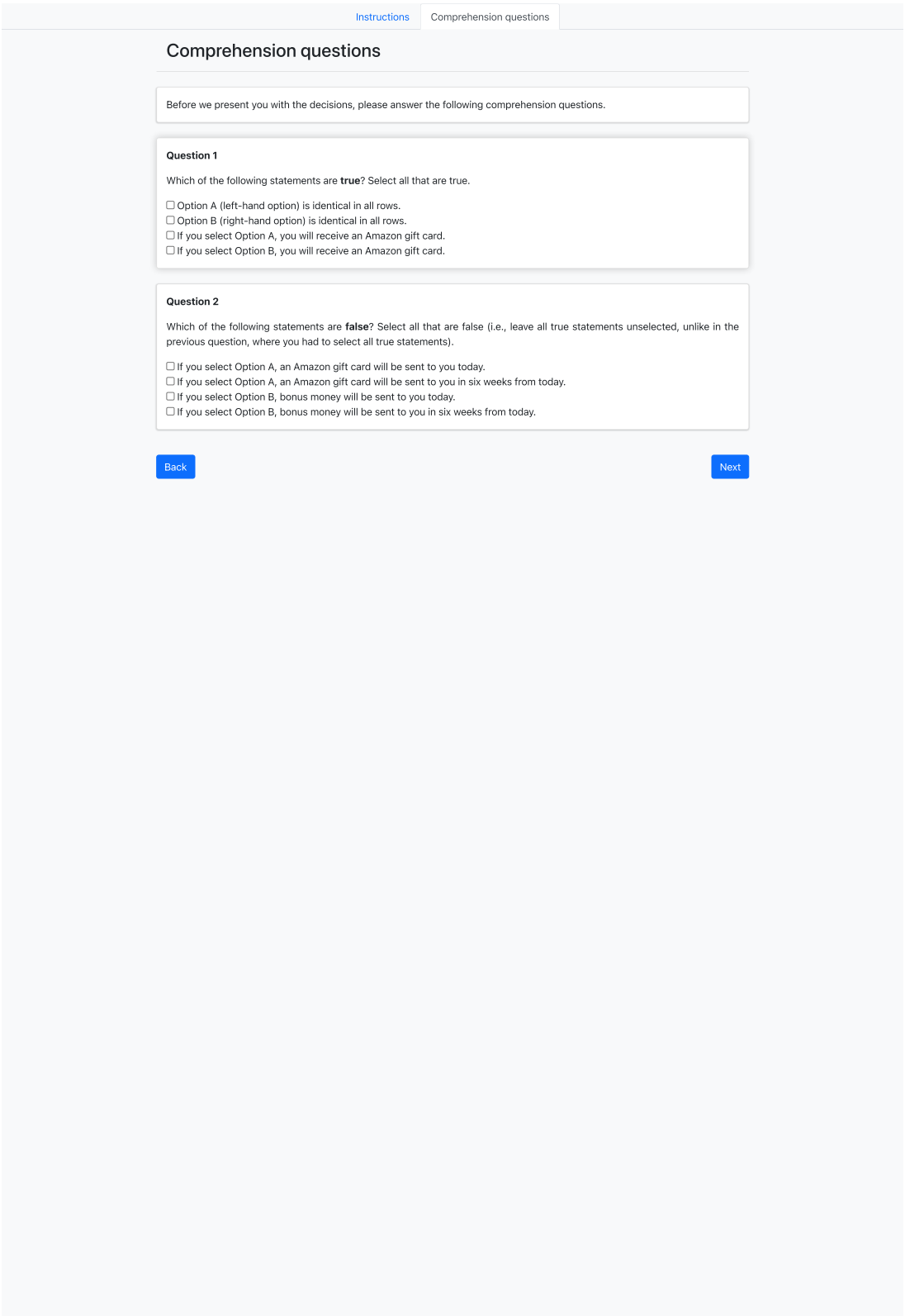


Figure G.60: Self social and non-social screen 5

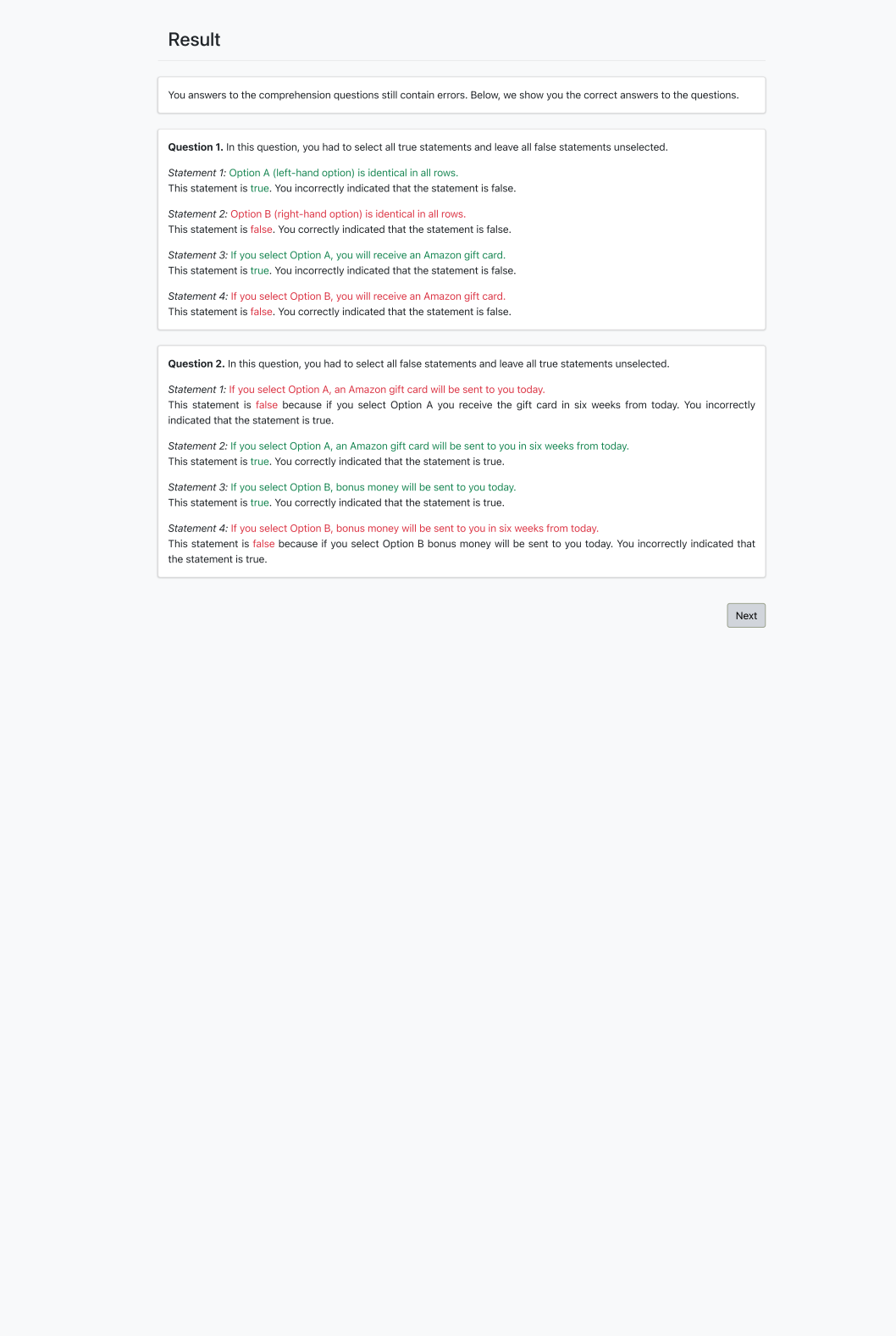


Figure G.61: Self social and non-social screen 6

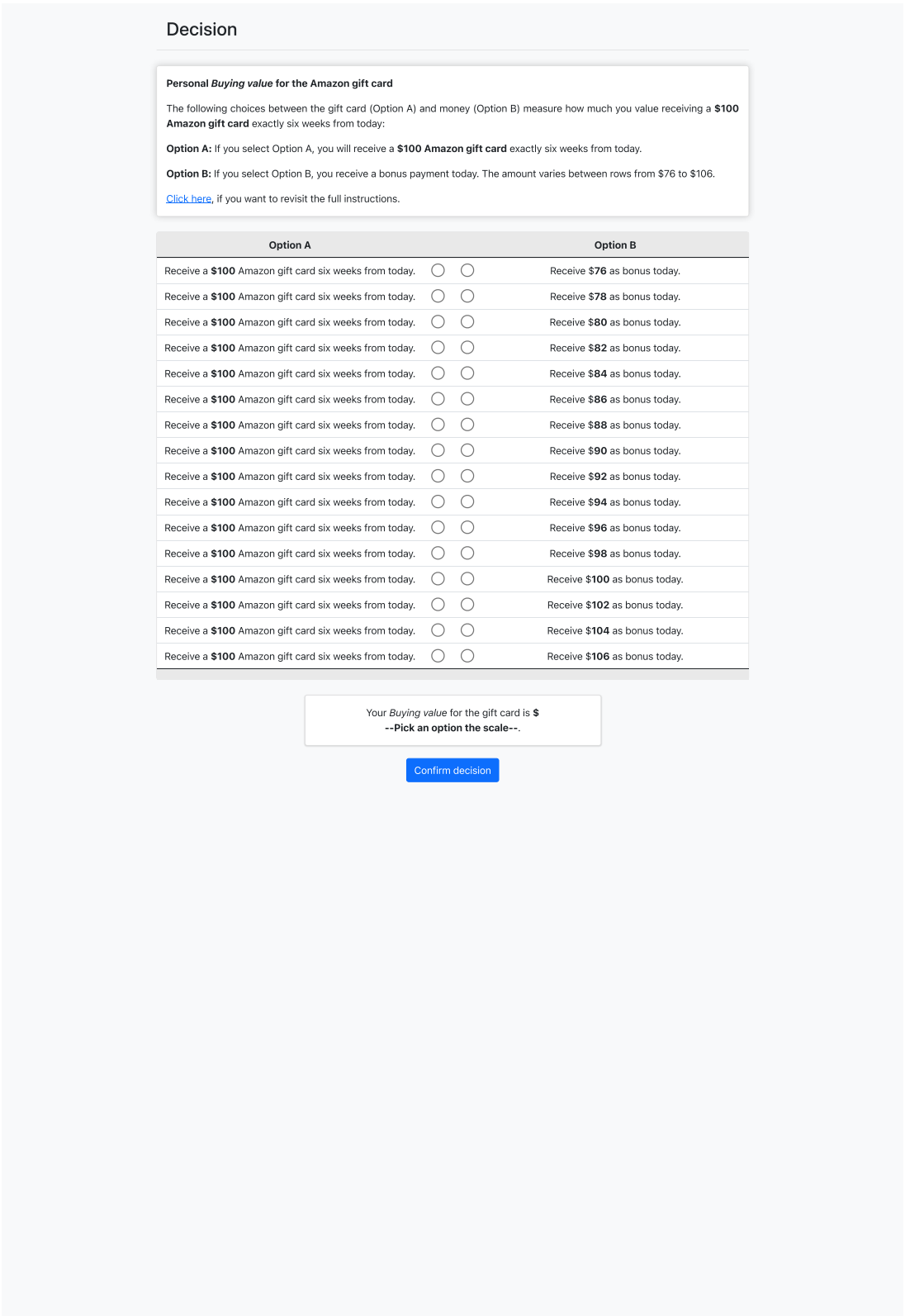


Figure G.62: Self social and non-social screen 7

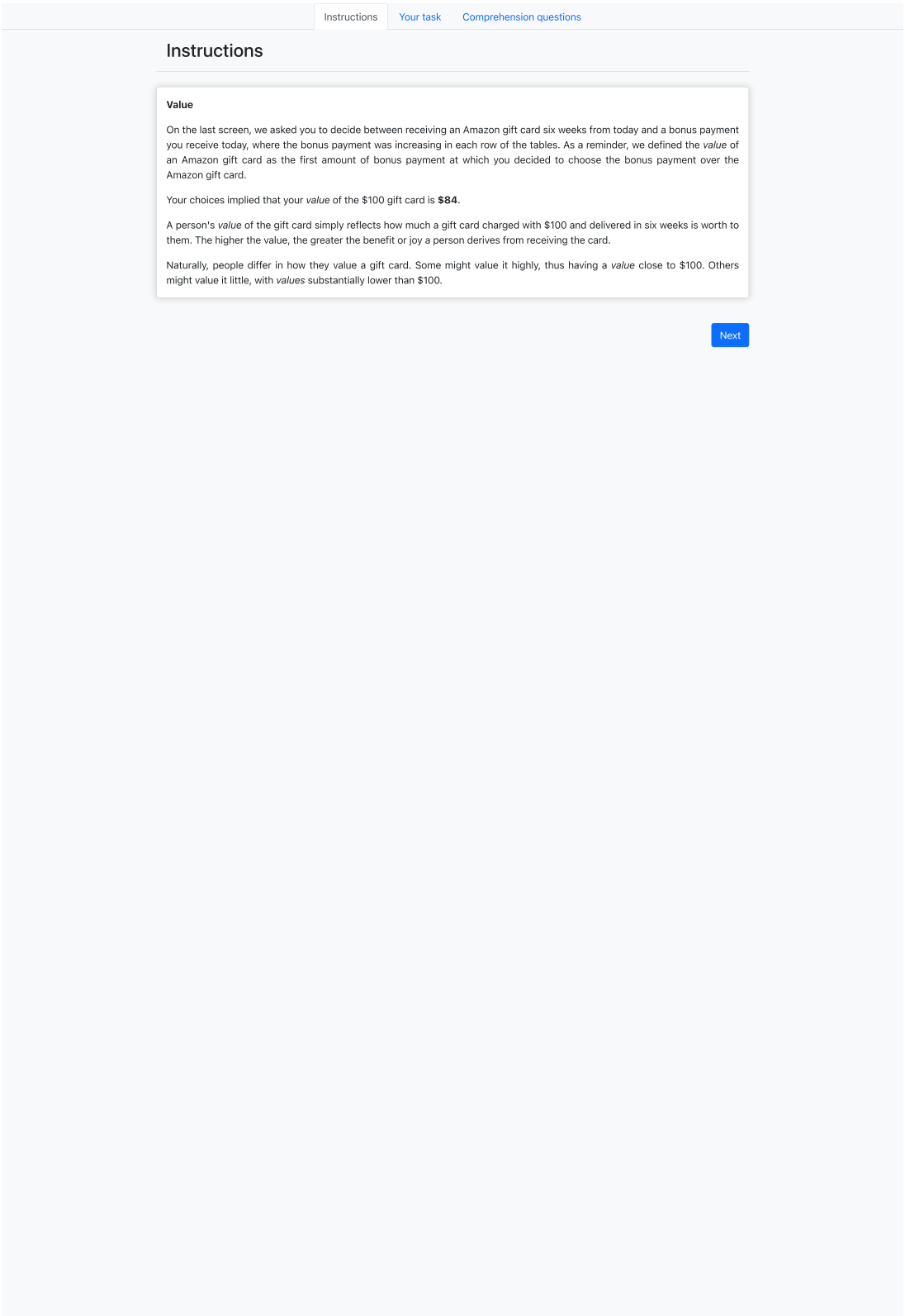


Figure G.63: Self social and non-social screen 8

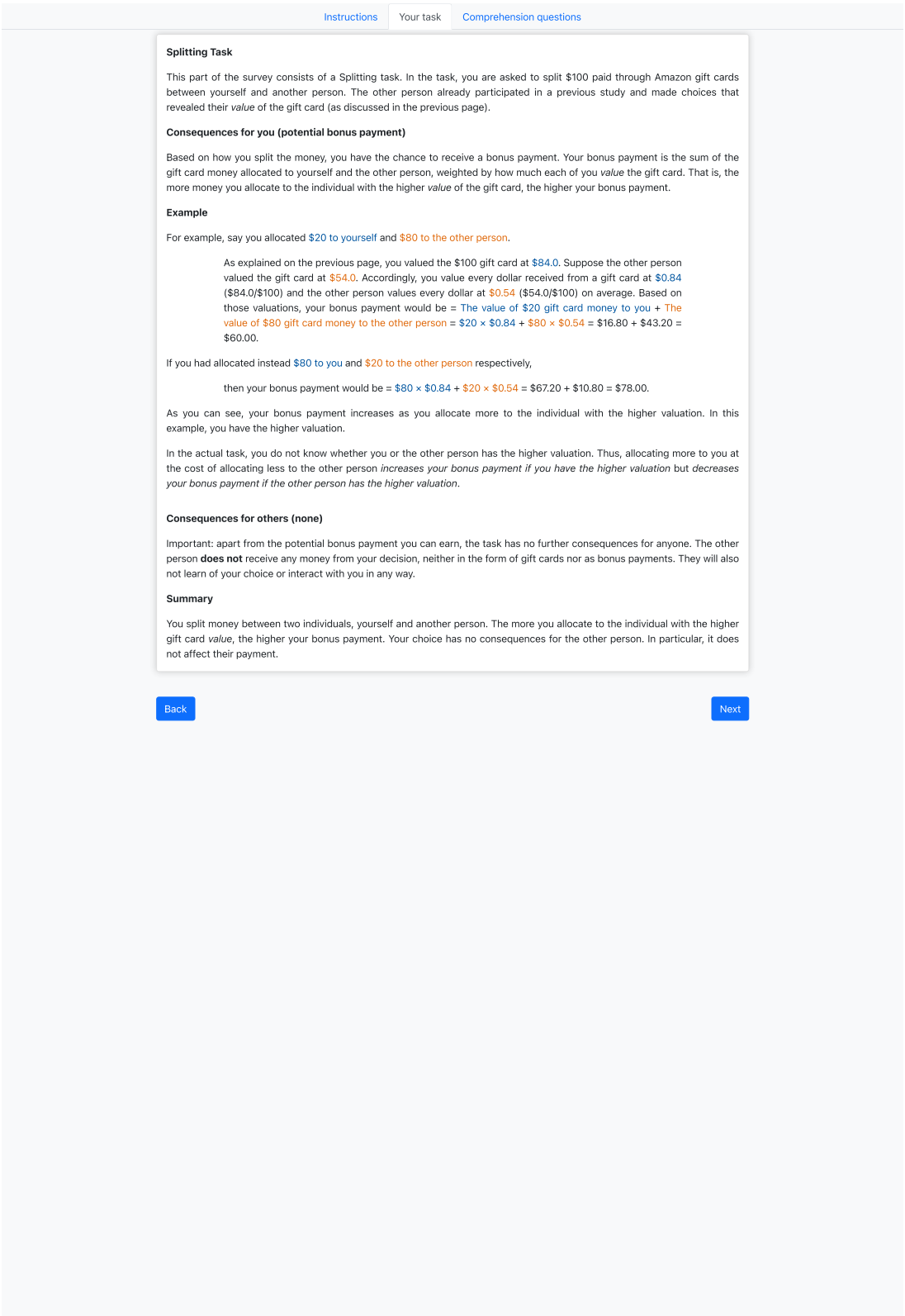


Figure G.64: Self social and non-social screen 9

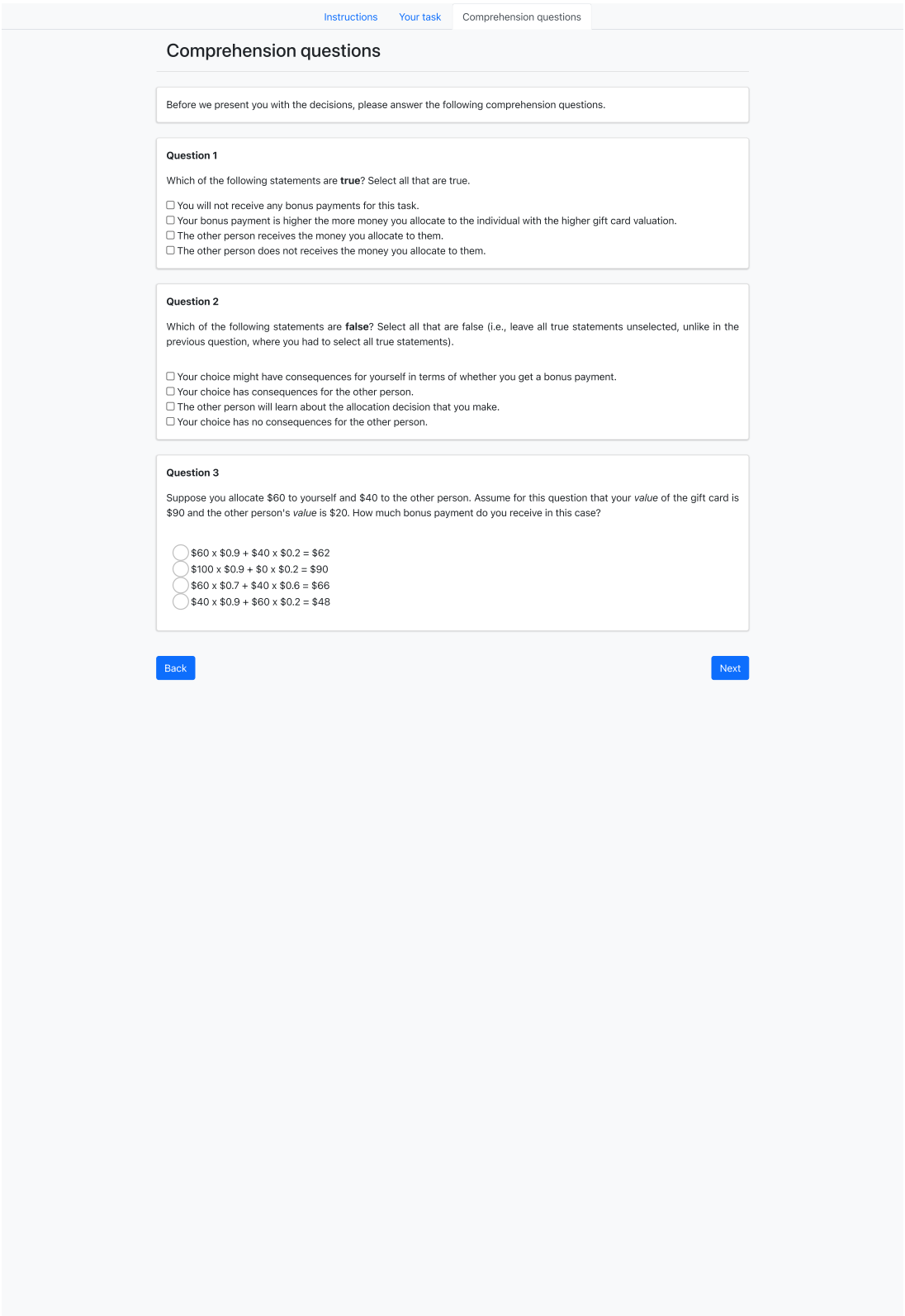


Figure G.65: Self social and non-social screen 10

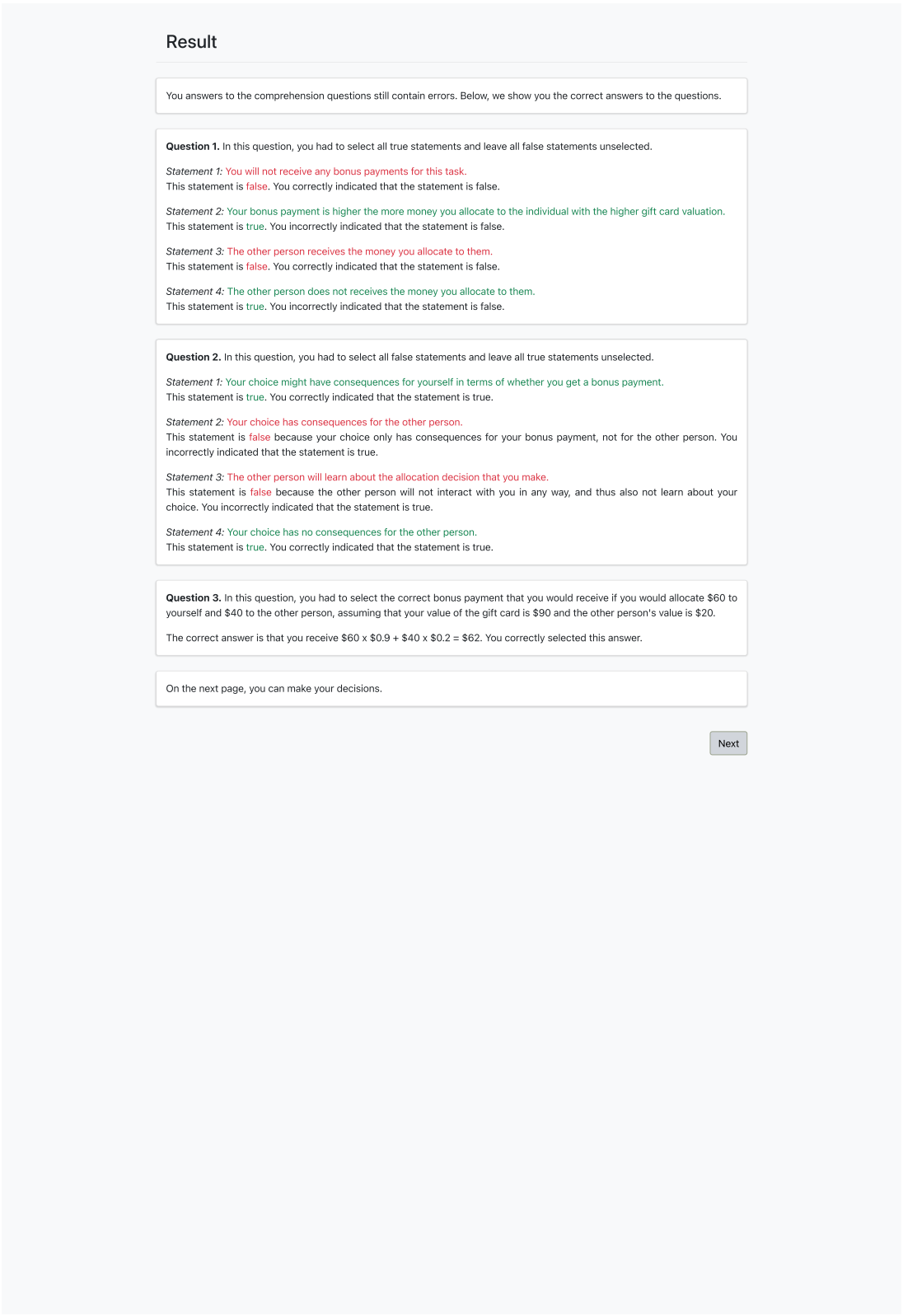
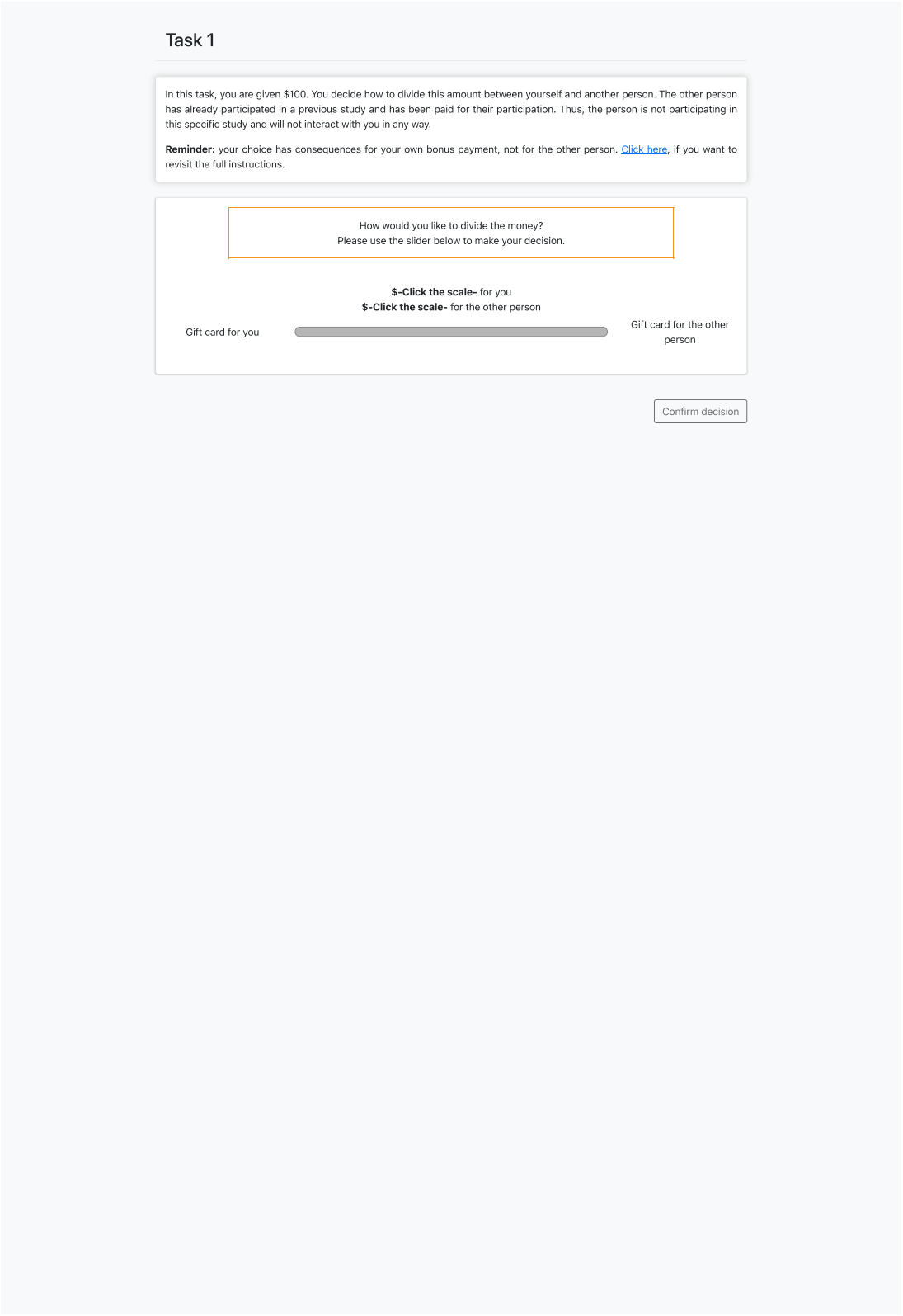


Figure G.66: Self social and non-social screen 11



G.2.2 Info self and Info other screens

Figure G.67: Info self and Info other screen 1

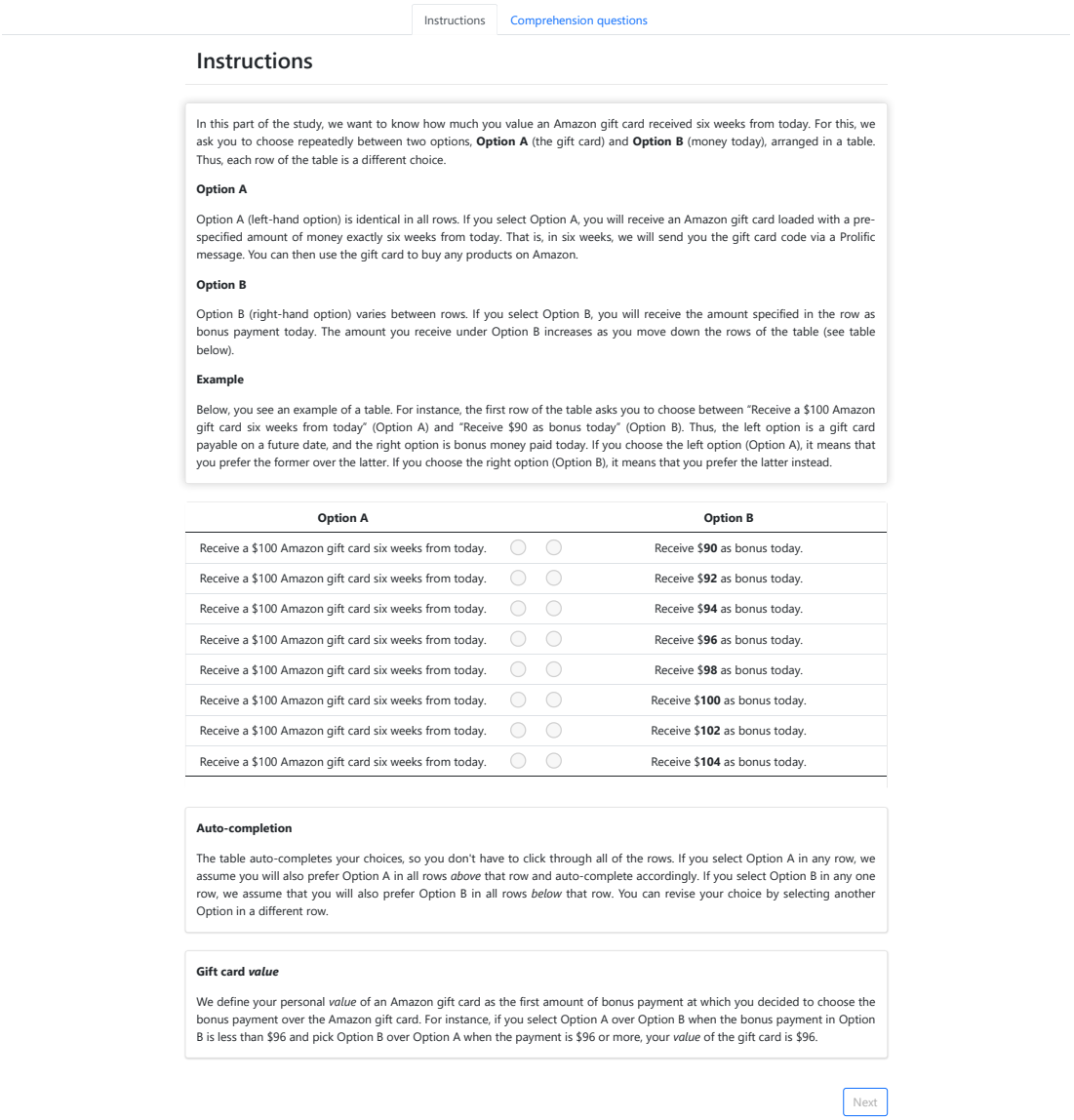


Figure G.68: Info self and Info other screen 2

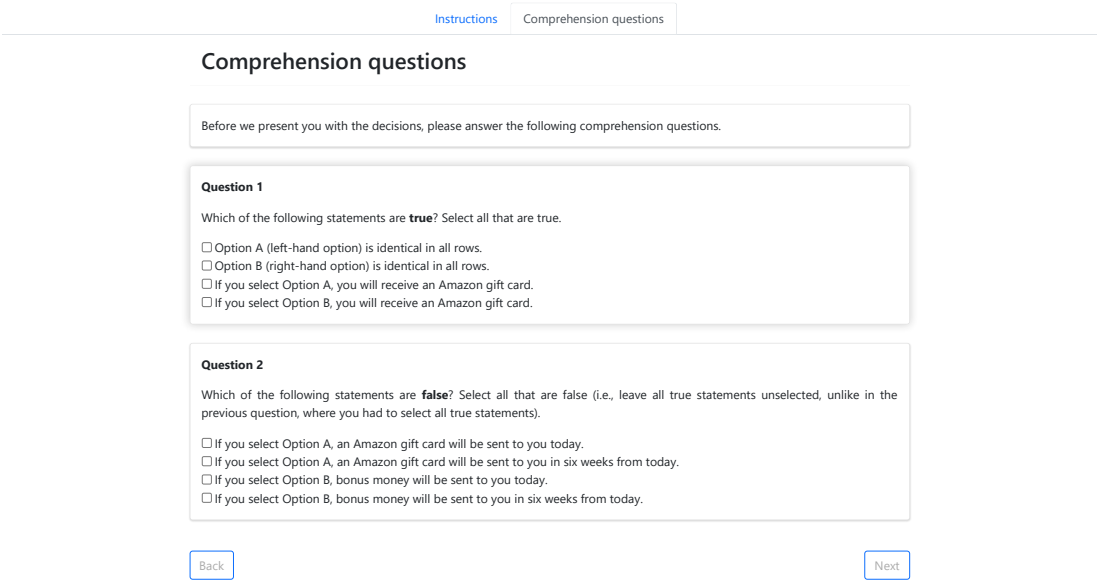


Figure G.69: Info self and Info other screen 3

Result

You answers to the comprehension questions still contain errors. Below, we show you the correct answers to the questions.

Question 1. In this question, you had to select all true statements and leave all false statements unselected.

Statement 1: Option A (left-hand option) is identical in all rows.
This statement is true. You incorrectly indicated that the statement is false.

Statement 2: Option B (right-hand option) is identical in all rows.
This statement is false. You correctly indicated that the statement is false.

Statement 3: If you select Option A, you will receive an Amazon gift card.
This statement is true. You incorrectly indicated that the statement is false.

Statement 4: If you select Option B, you will receive an Amazon gift card.
This statement is false. You correctly indicated that the statement is false.

Question 2. In this question, you had to select all false statements and leave all true statements unselected.

Statement 1: If you select Option A, an Amazon gift card will be sent to you today.
This statement is false because if you select Option A you receive the gift card in six weeks from today. You incorrectly indicated that the statement is true.

Statement 2: If you select Option A, an Amazon gift card will be sent to you in six weeks from today.
This statement is true. You correctly indicated that the statement is true.

Statement 3: If you select Option B, bonus money will be sent to you today.
This statement is true. You correctly indicated that the statement is true.

Statement 4: If you select Option B, bonus money will be sent to you in six weeks from today.
This statement is false because if you select Option B bonus money will be sent to you today. You incorrectly indicated that the statement is true.

Next

Figure G.70: Info self and Info other screen 4

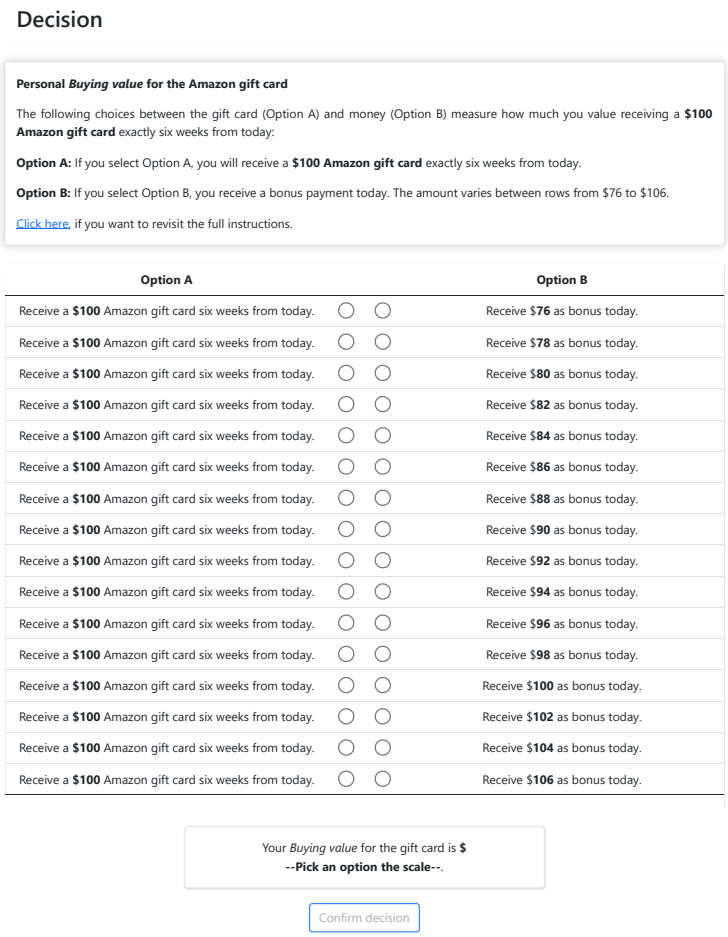


Figure G.71: Info self and Info other screen 5

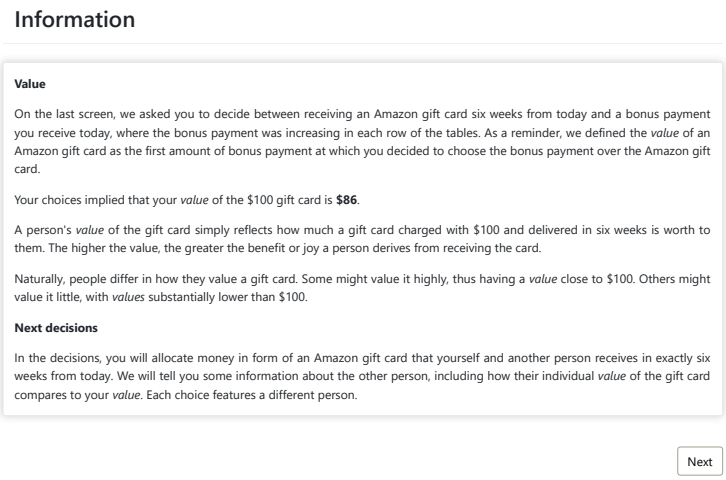


Figure G.72: Info self and Info other screen 6

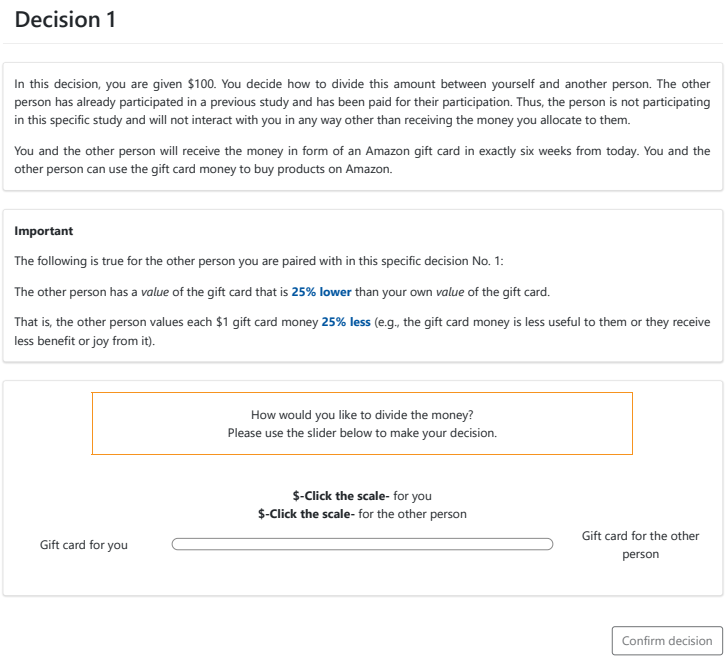
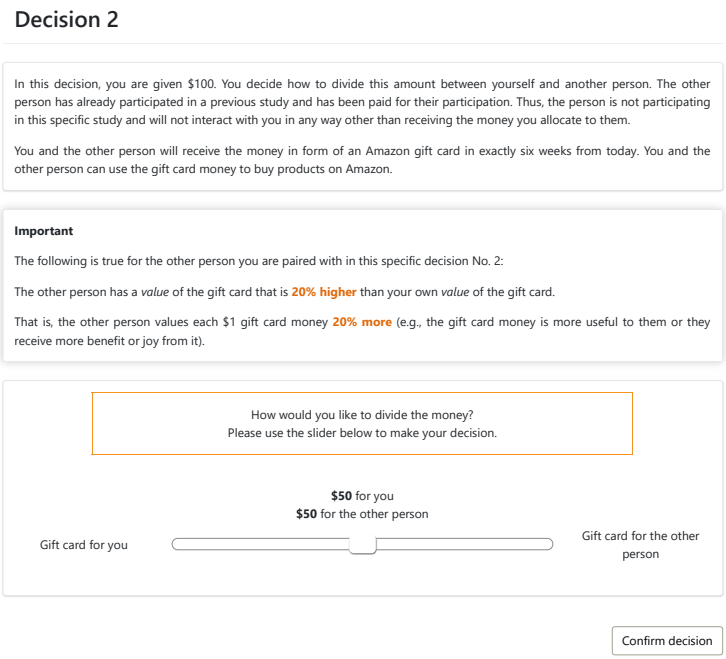


Figure G.73: Info self and Info other screen 7



G.2.3 Incentive self and Incentive other screens

Figure G.74: Incentive self and Incentive other screen 1

Figure G.75: Incentive self and Incentive other screen 2

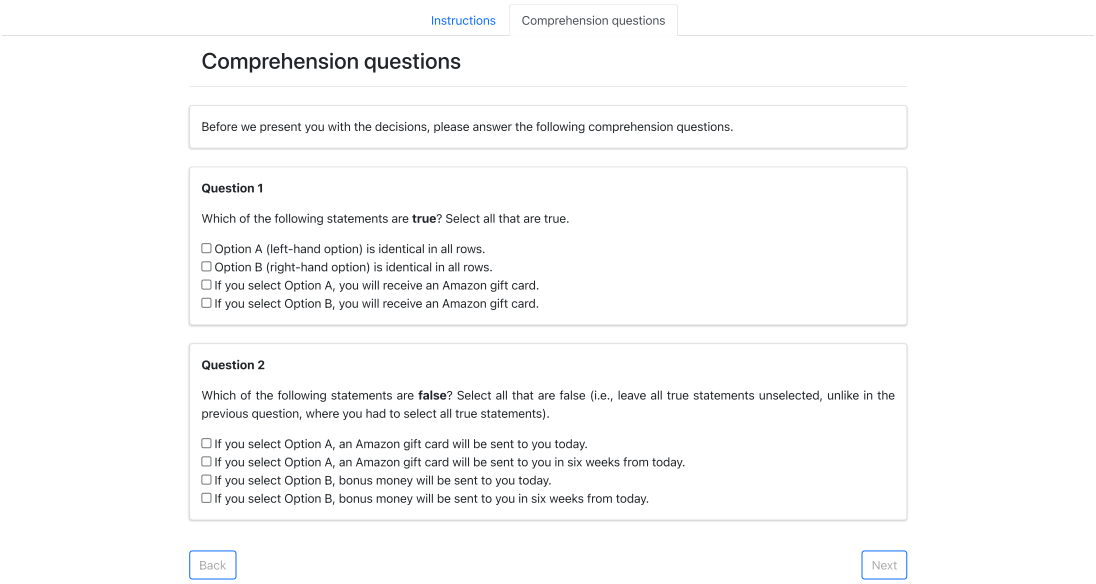


Figure G.76: Incentive self and Incentive other screen 3

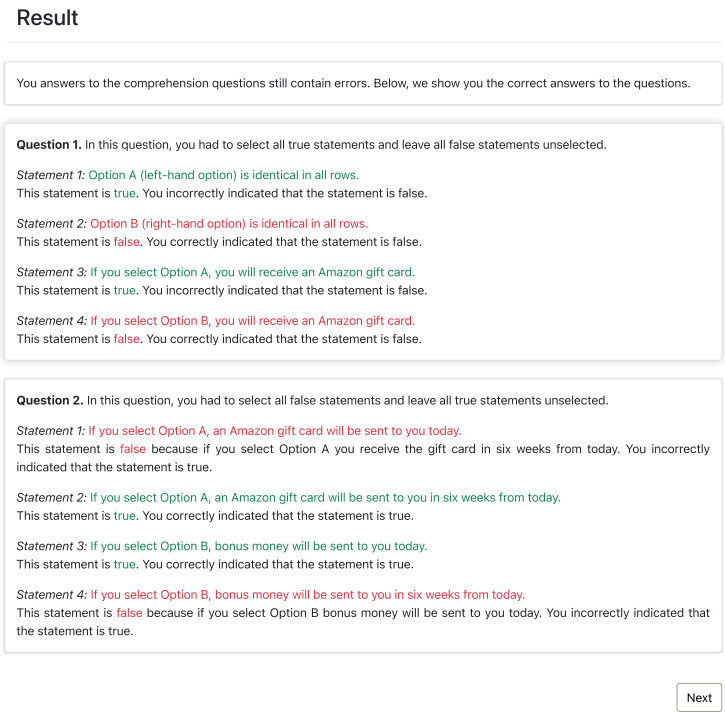


Figure G.77: Incentive self and Incentive other screen 4

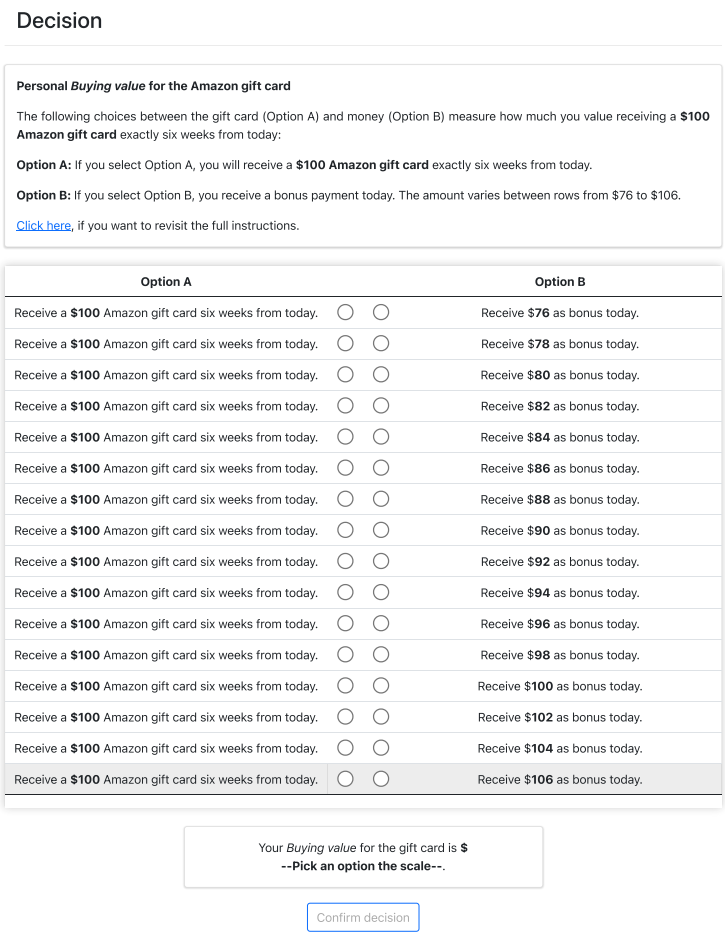


Figure G.78: Incentive self and Incentive other screen 5

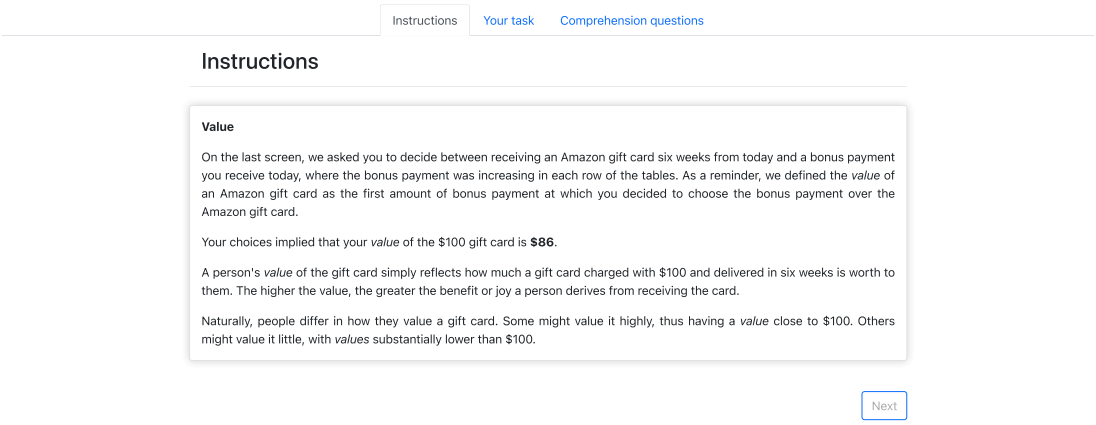


Figure G.79: Incentive self and Incentive other screen 6

Figure G.80: Incentive self and Incentive other screen 7

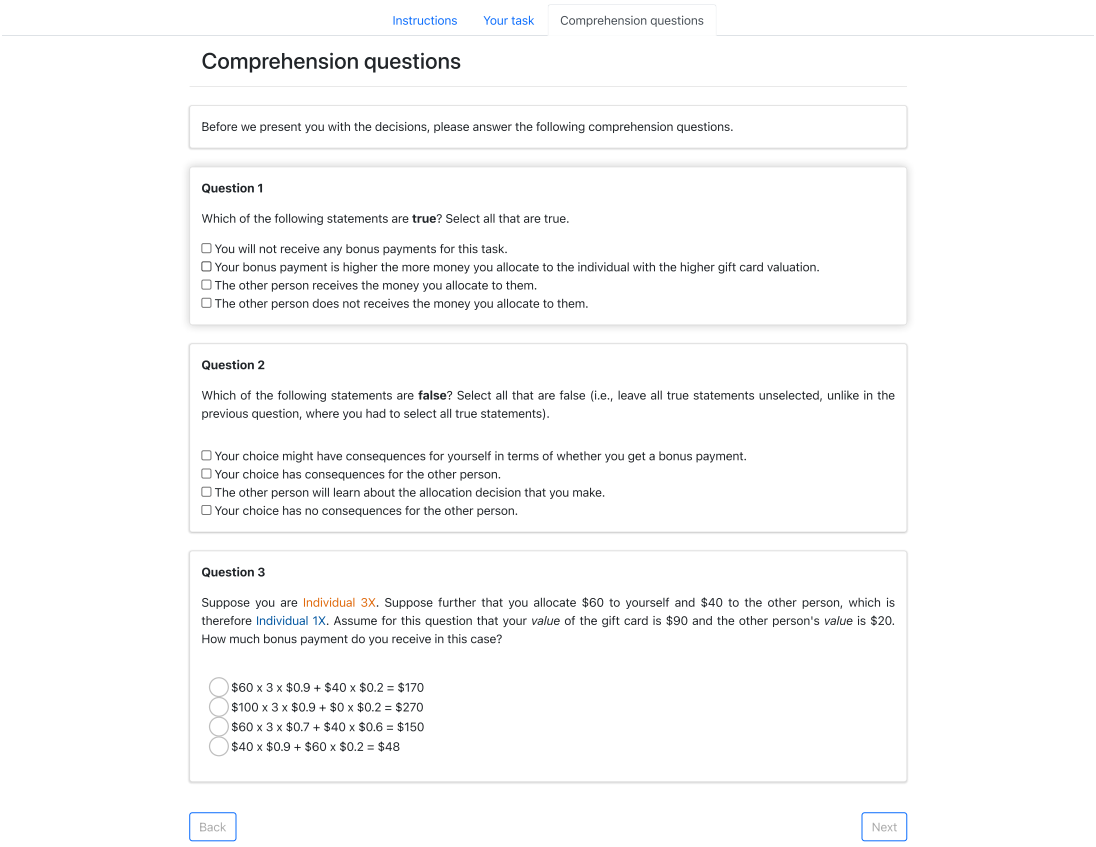


Figure G.81: Incentive self and Incentive other screen 8

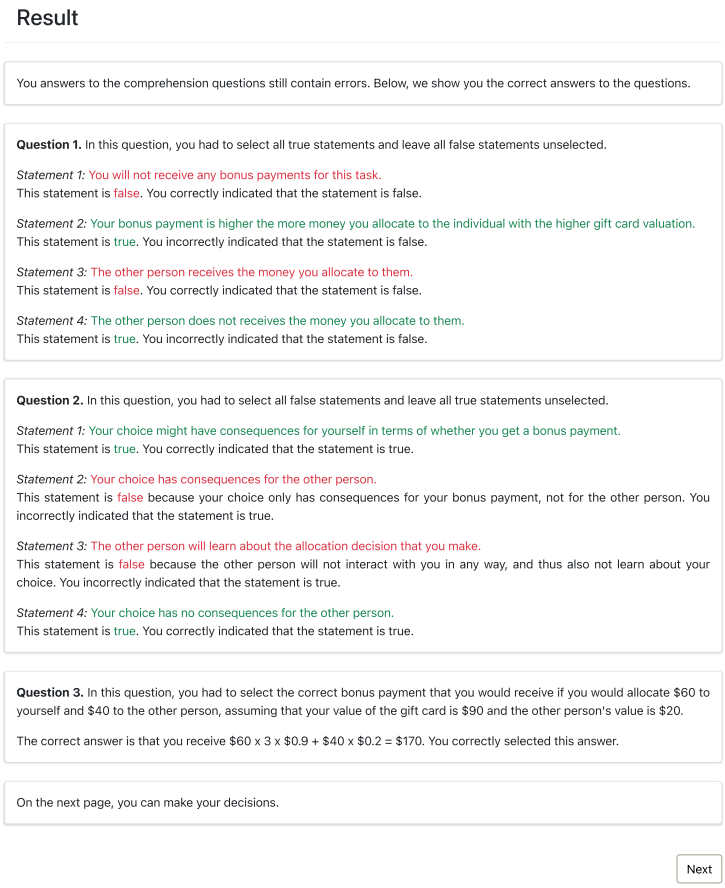


Figure G.82: Incentive self and Incentive other screen 9

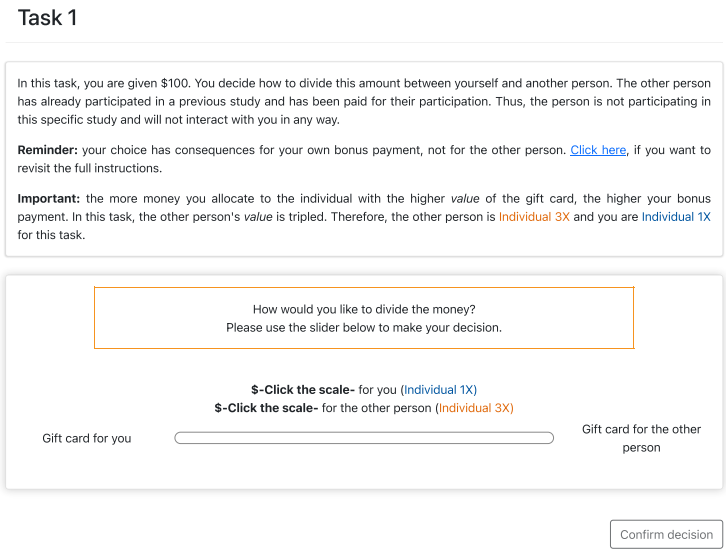


Figure G.83: Incentive self and Incentive other screen 10

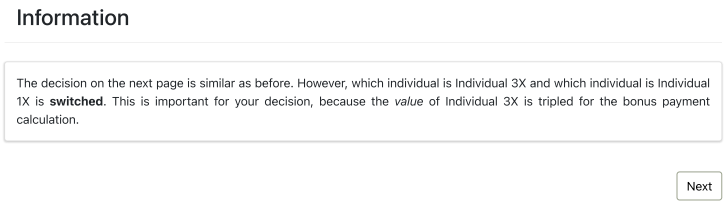
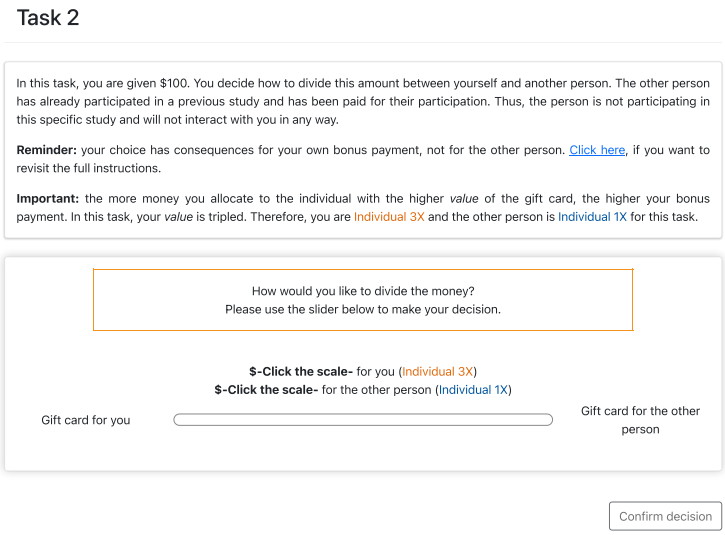


Figure G.84: Incentive self and Incentive other screen 11



G.3 Giving versus Taking paradigm screens

Figure G.85: Giving versus Taking paradigm screen 1

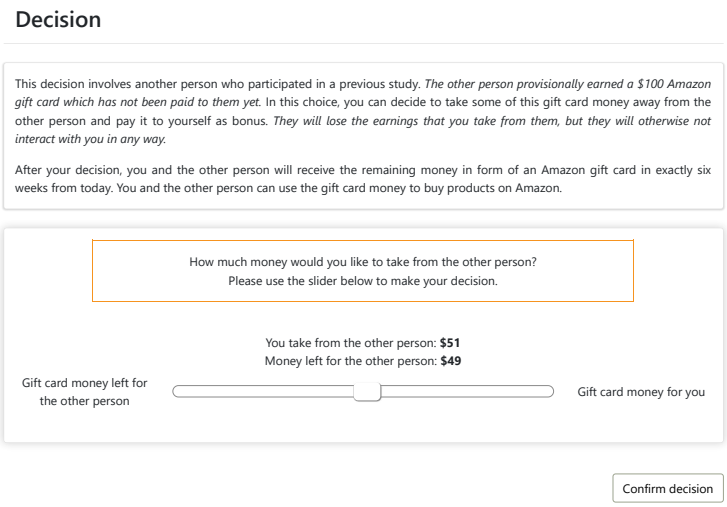


Figure G.86: Giving versus Taking paradigm screen 2

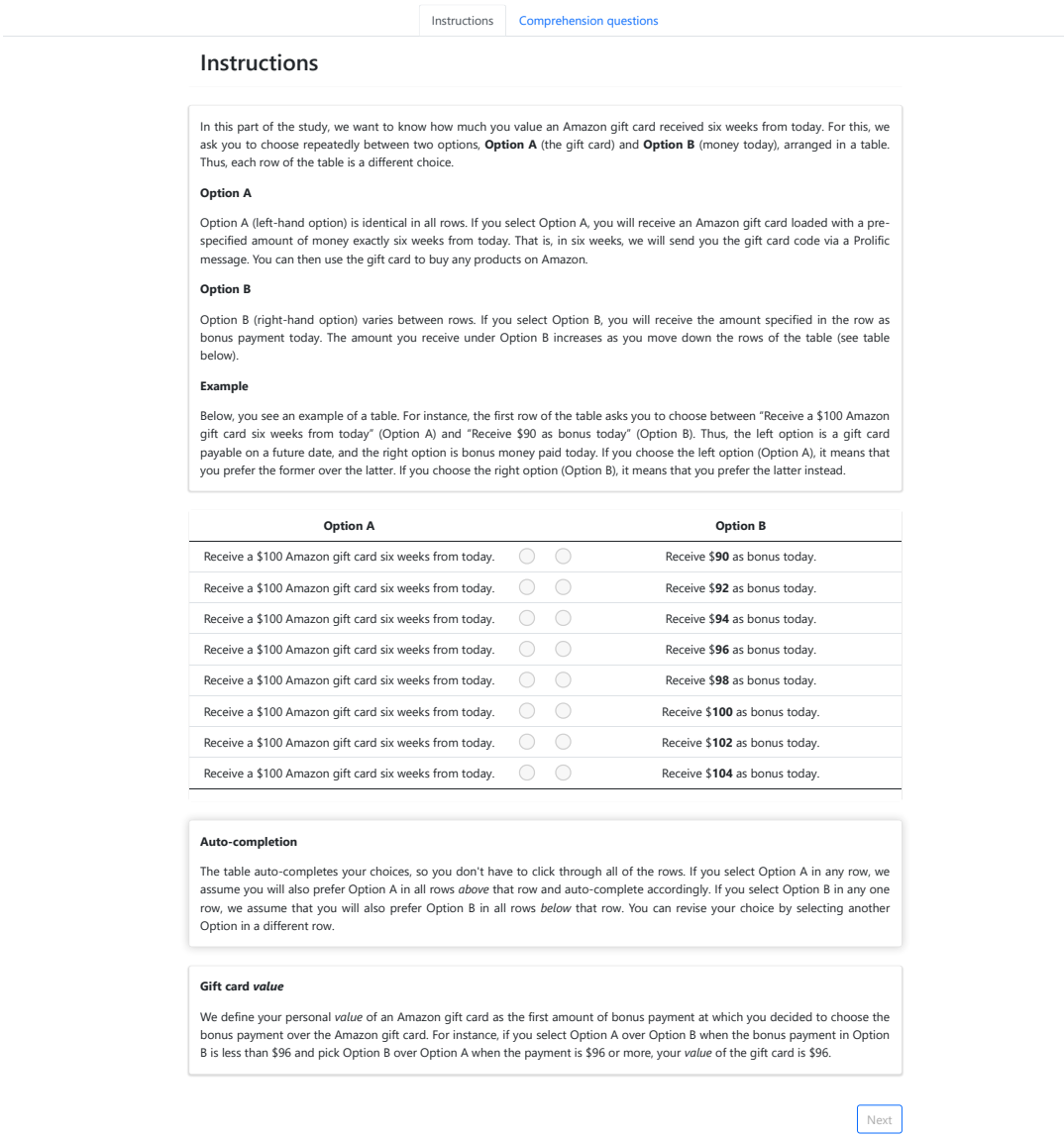


Figure G.87: Giving versus Taking paradigm screen 3

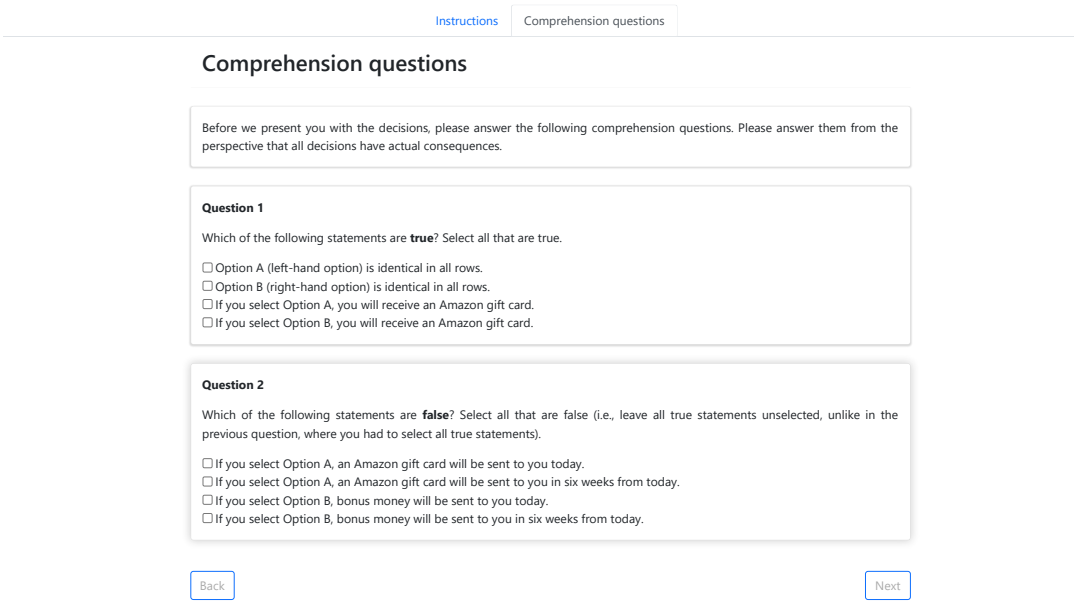


Figure G.88: Giving versus Taking paradigm screen 4

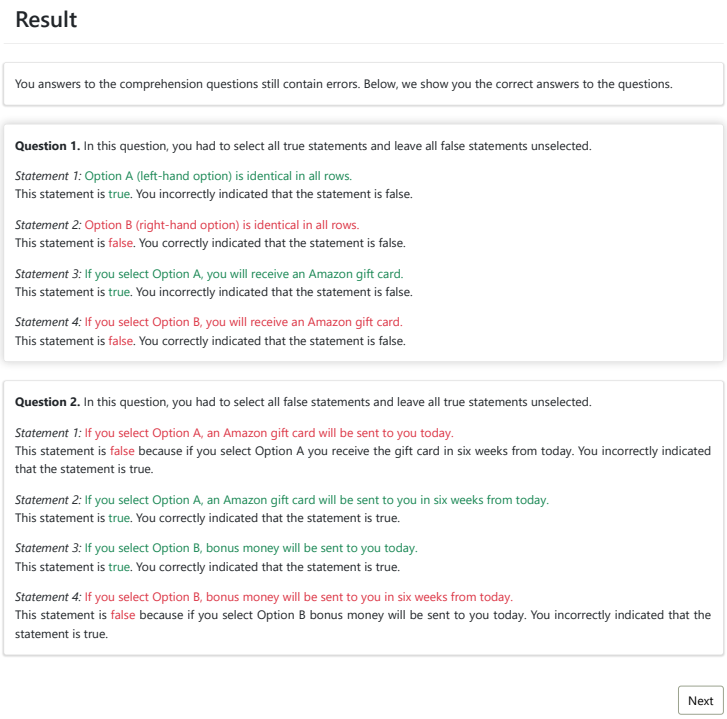


Figure G.89: Giving versus Taking paradigm screen 5

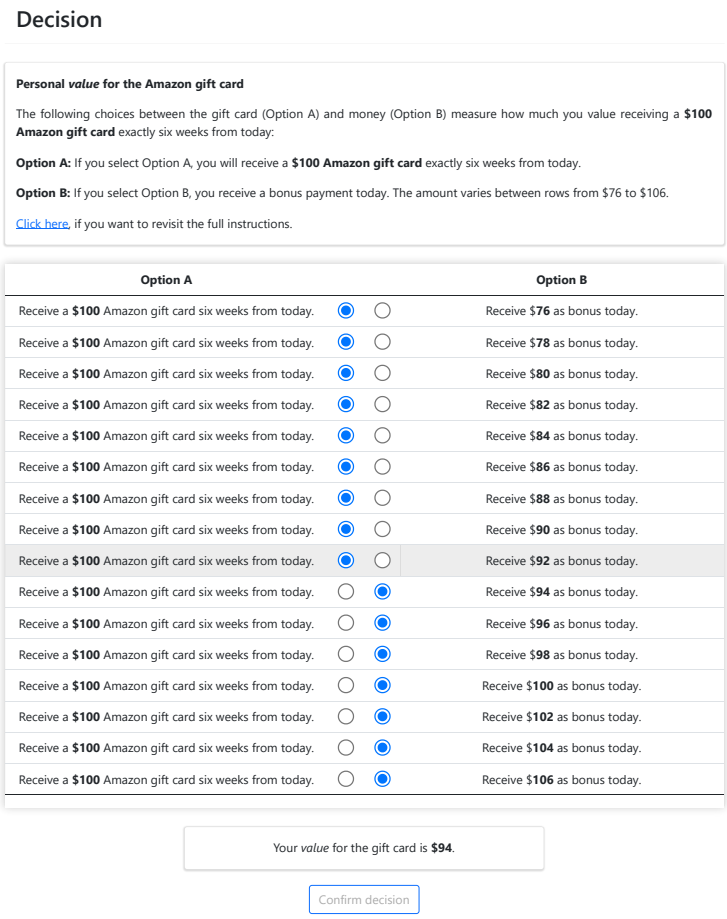


Figure G.90: Giving versus Taking paradigm screen 6

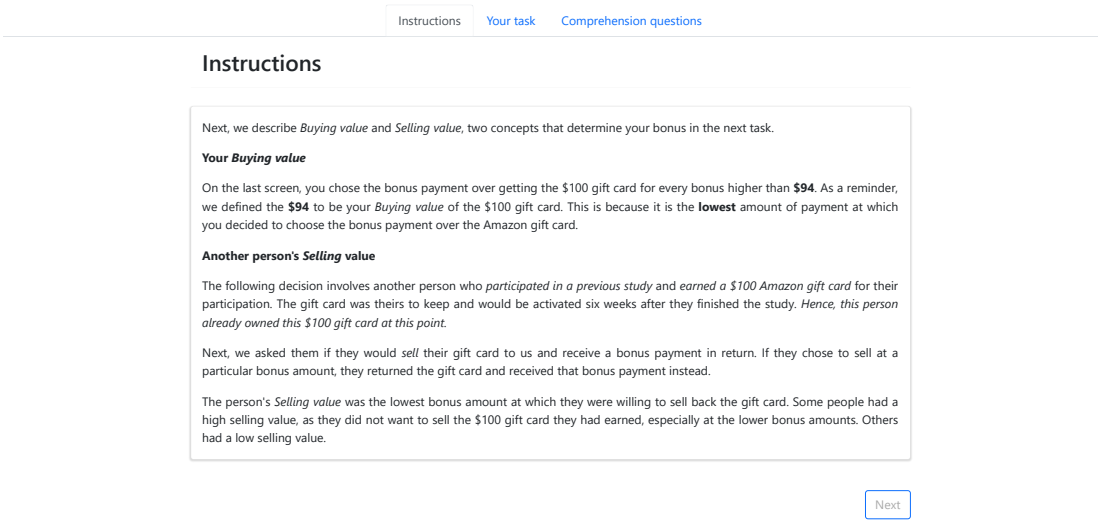


Figure G.91: Giving versus Taking paradigm screen 7

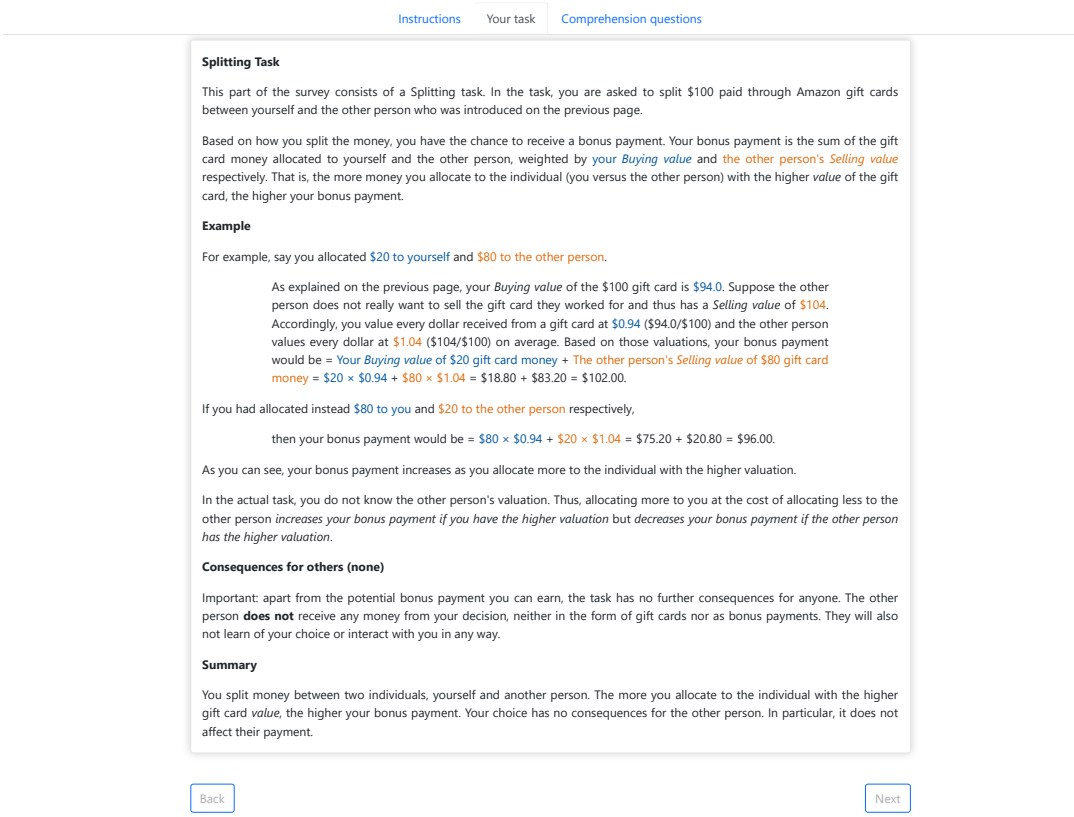


Figure G.92: Giving versus Taking paradigm screen 8

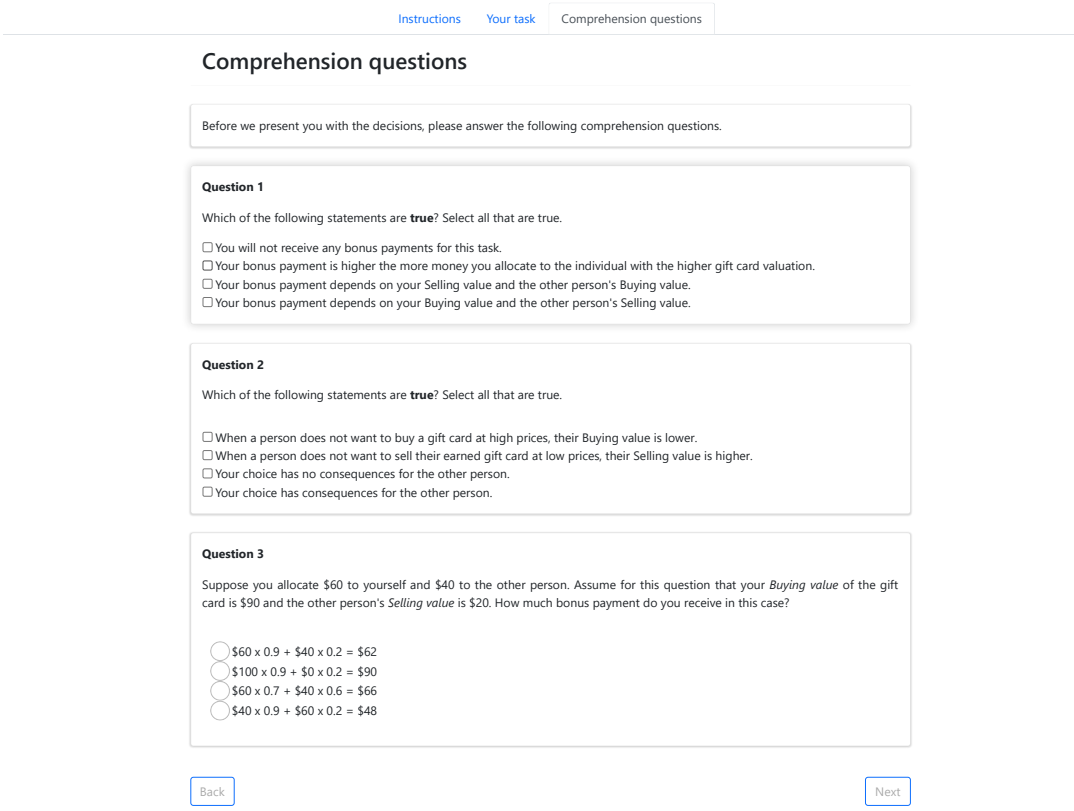


Figure G.93: Giving versus Taking paradigm screen 9

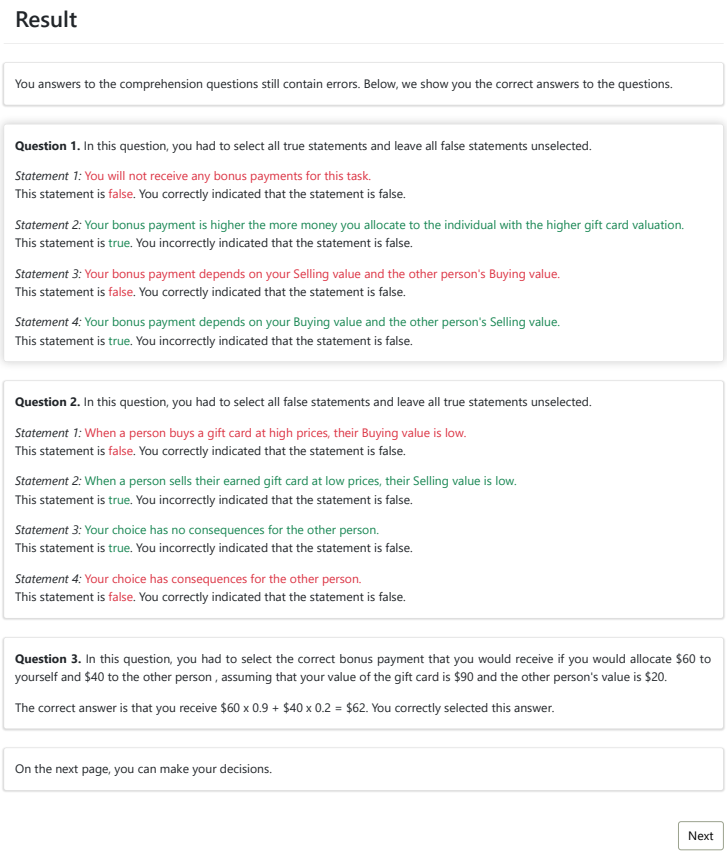


Figure G.94: Giving versus Taking paradigm screen 10

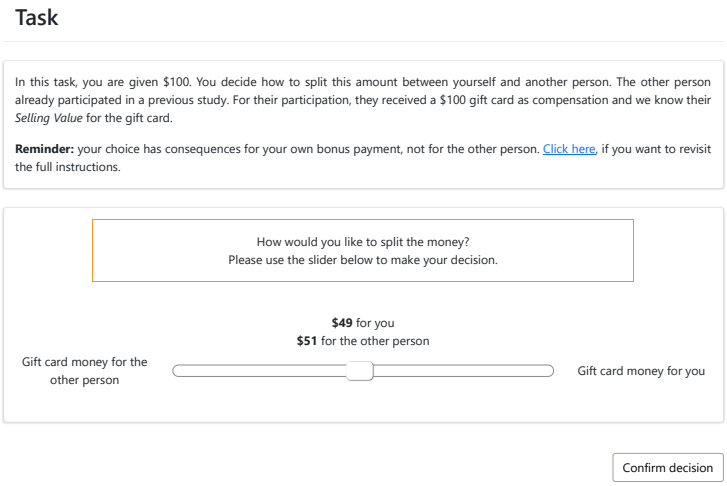
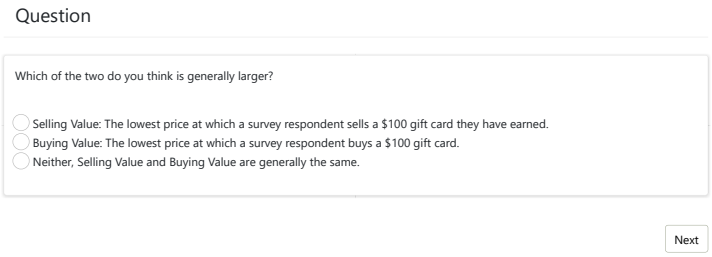
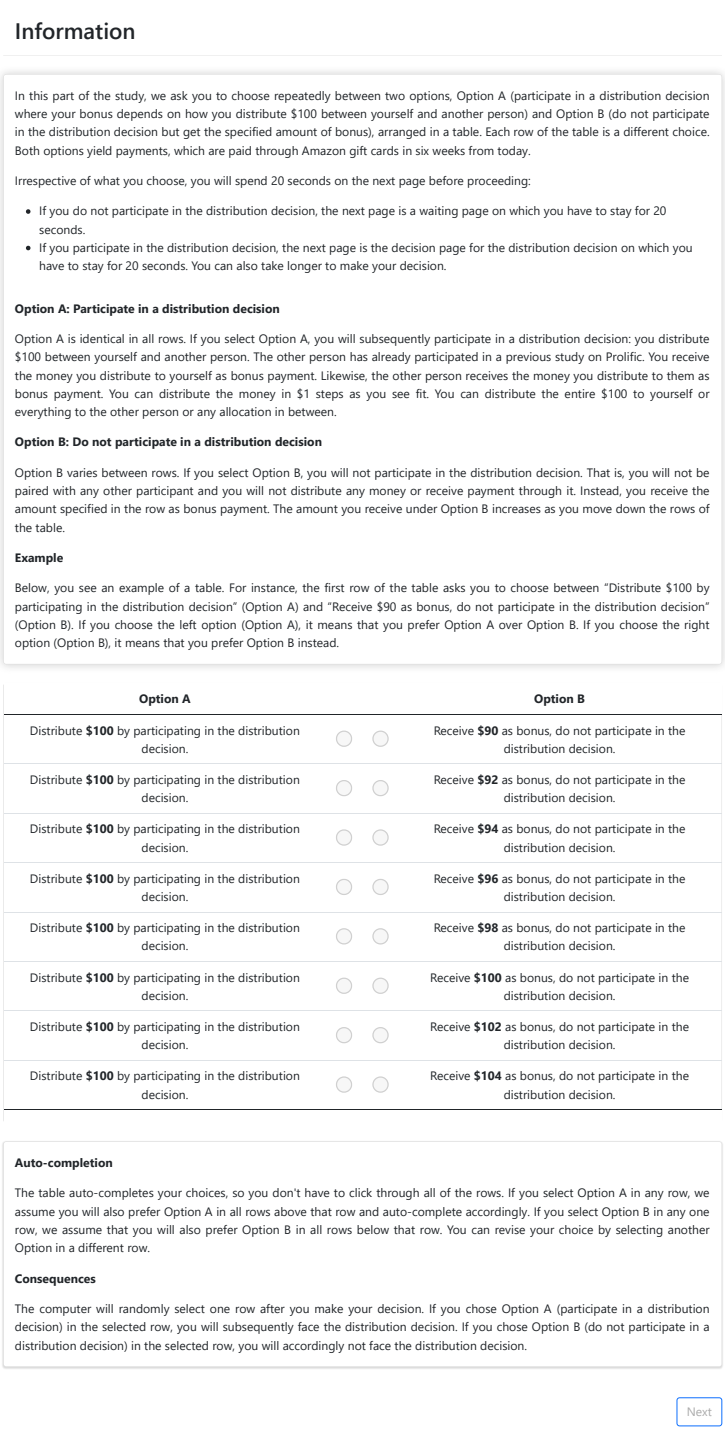


Figure G.95: Giving versus Taking paradigm screen 11



G.4 Avoiding the ask paradigm screens

Figure G.96: Avoiding the ask paradigm screen 1



Information

In this part of the study, we ask you to choose repeatedly between two options, Option A (participate in a distribution decision where your bonus depends on how you distribute $100 between yourself and another person) and Option B (do not participate in the distribution decision but get the specified amount of bonus), arranged in a table. Each row of the table is a different choice. Both options yield payments, which are paid through Amazon gift cards in six weeks from today.

Irrespective of what you choose, you will spend 20 seconds on the next page before proceeding:

- If you do not participate in the distribution decision, the next page is a waiting page on which you have to stay for 20 seconds.
- If you participate in the distribution decision, the next page is the decision page for the distribution decision on which you have to stay for 20 seconds. You can also take longer to make your decision.

Option A: Participate in a distribution decision

Option A is identical in all rows. If you select Option A, you will subsequently participate in a distribution decision: you distribute $100 between yourself and another person. The other person has already participated in a previous study on Prolific. You receive the money you distribute to yourself as bonus payment. Likewise, the other person receives the money you distribute to them as bonus payment. You can distribute the money in $1 steps as you see fit. You can distribute the entire $100 to yourself or everything to the other person or any allocation in between.

Option B: Do not participate in a distribution decision

Option B varies between rows. If you select Option B, you will not participate in the distribution decision. That is, you will not be paired with any other participant and you will not distribute any money or receive payment through it. Instead, you receive the amount specified in the row as bonus payment. The amount you receive under Option B increases as you move down the rows of the table.

Example

Below, you see an example of a table. For instance, the first row of the table asks you to choose between "Distribute $100 by participating in the distribution decision" (Option A) and "Receive $90 as bonus, do not participate in the distribution decision" (Option B). If you choose the left option (Option A), it means that you prefer Option A over Option B. If you choose the right option (Option B), it means that you prefer Option B instead.

Option A		Option B
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$90** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$92** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$94** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$96** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$98** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$100** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$102** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○ ○	Receive **$104** as bonus, do not participate in the distribution decision.

Auto-completion

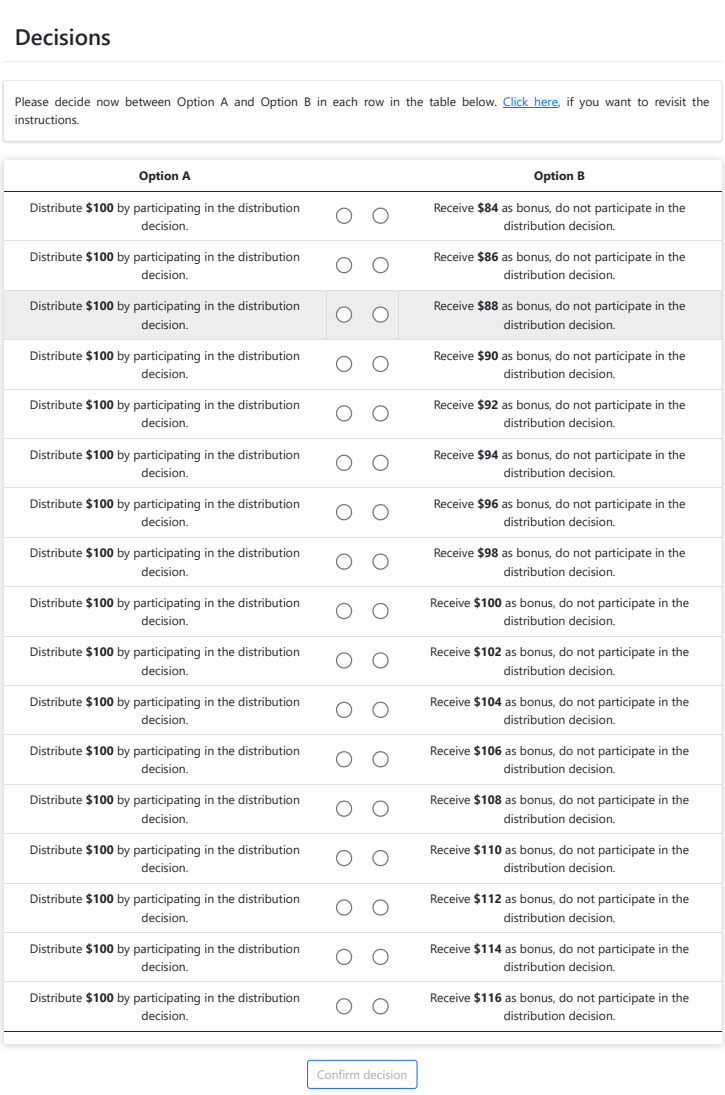
The table auto-completes your choices, so you don't have to click through all of the rows. If you select Option A in any row, we assume you will also prefer Option A in all rows above that row and auto-complete accordingly. If you select Option B in any one row, we assume that you will also prefer Option B in all rows below that row. You can revise your choice by selecting another Option in a different row.

Consequences

The computer will randomly select one row after you make your decision. If you chose Option A (participate in a distribution decision) in the selected row, you will subsequently face the distribution decision. If you chose Option B (do not participate in a distribution decision) in the selected row, you will accordingly not face the distribution decision.

Next

Figure G.97: Avoiding the ask paradigm screen 2



Decisions

Please decide now between Option A and Option B in each row in the table below. Click here, if you want to revisit the instructions.

Option A			Option B
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$84** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$86** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$88** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$90** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$92** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$94** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$96** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$98** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$100** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$102** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$104** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$106** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$108** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$110** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$112** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$114** as bonus, do not participate in the distribution decision.
Distribute **$100** by participating in the distribution decision.	○	○	Receive **$116** as bonus, do not participate in the distribution decision.

Confirm decision

Figure G.98: Avoiding the ask paradigm screen 3

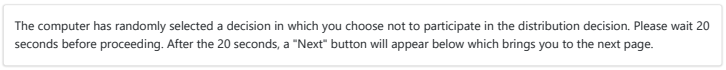


Figure G.99: Avoiding the ask paradigm screen 4

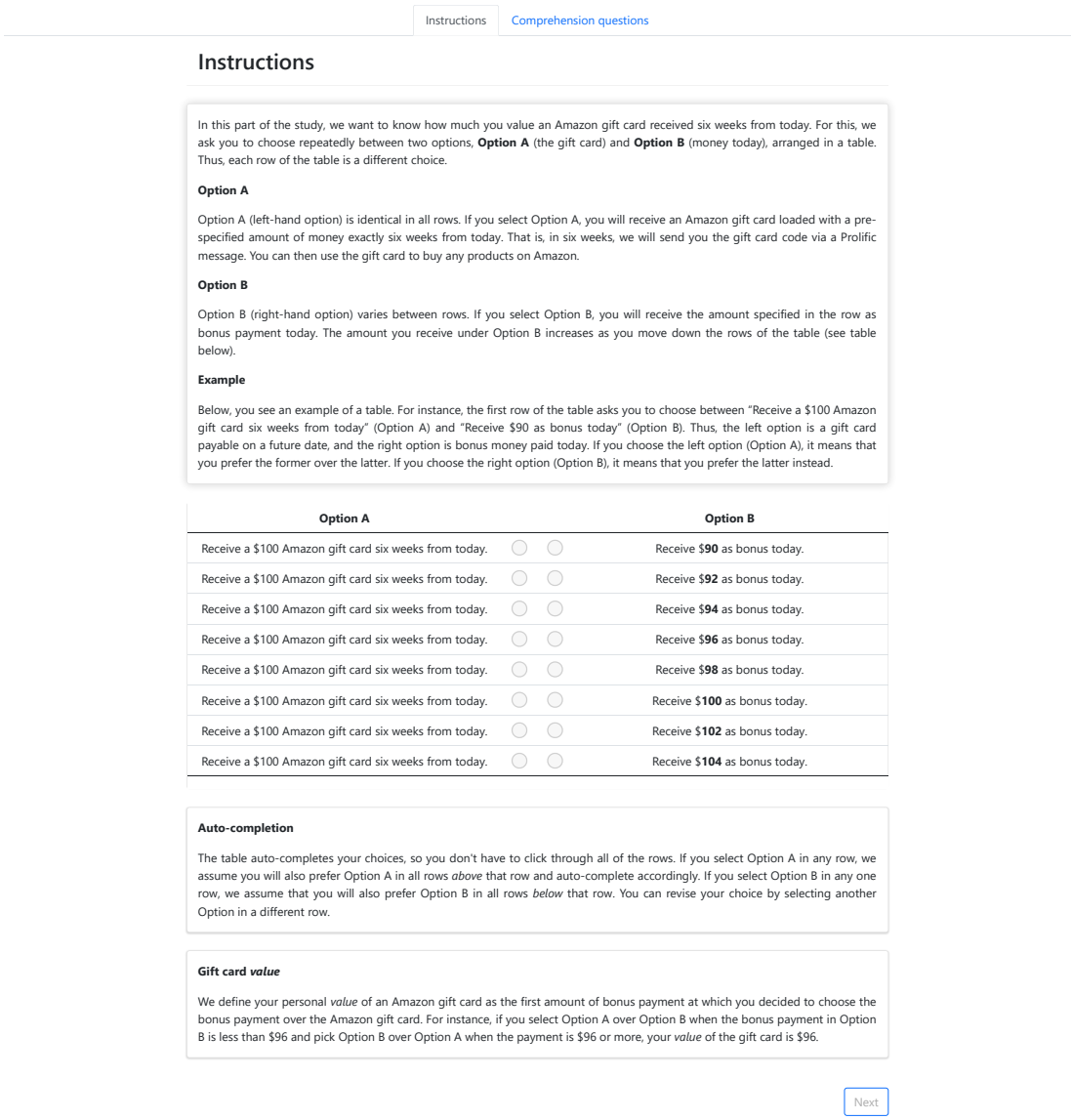


Figure G.100: Avoiding the ask paradigm screen 5

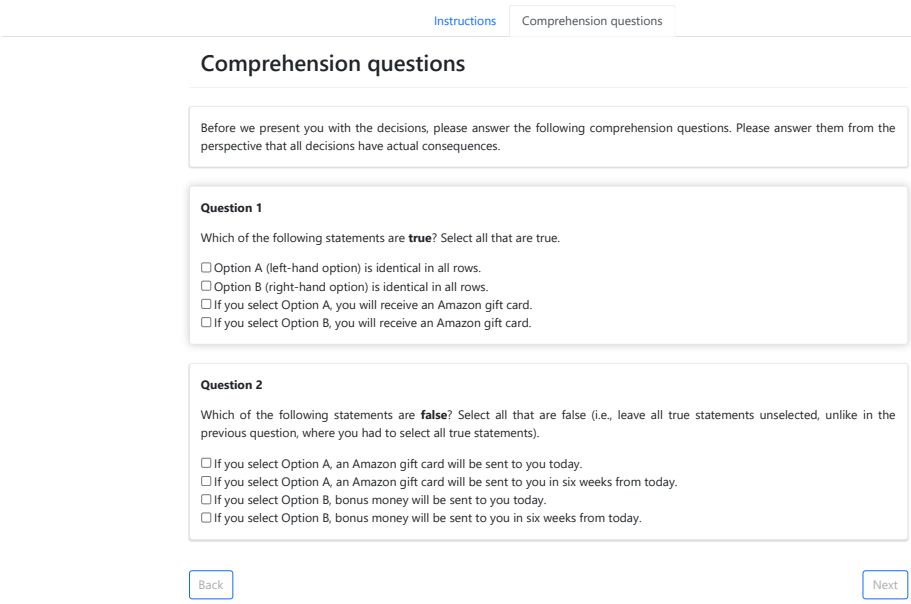


Figure G.101: Avoiding the ask paradigm screen 6

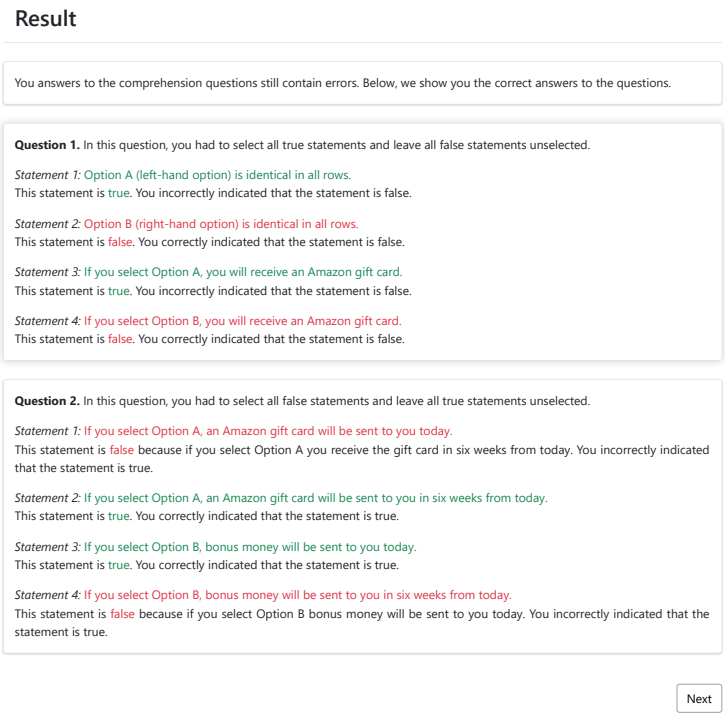


Figure G.102: Avoiding the ask paradigm screen 7

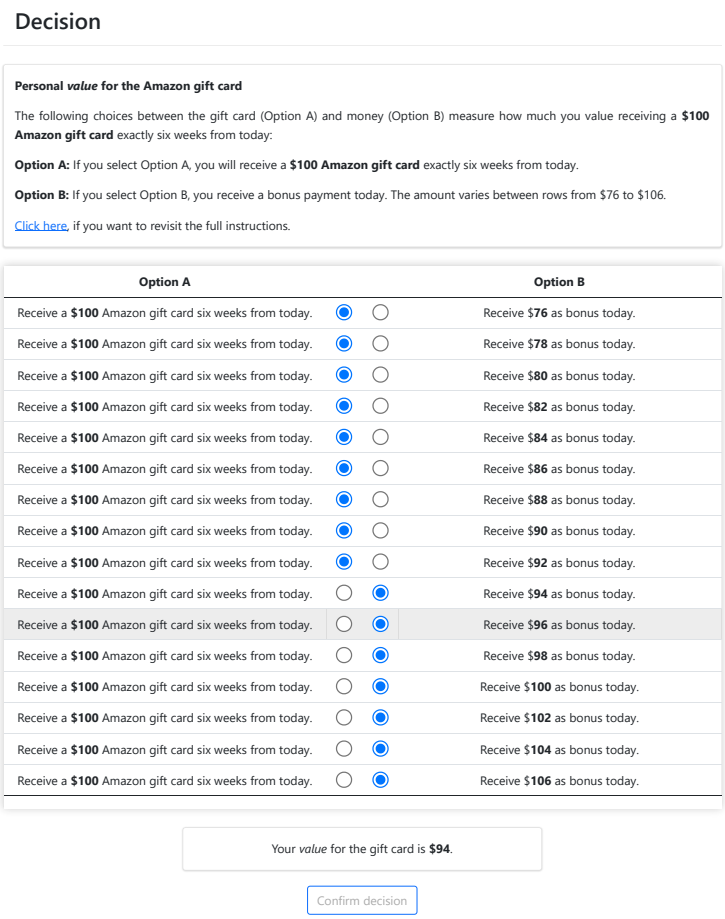


Figure G.103: Avoiding the ask paradigm screen 8

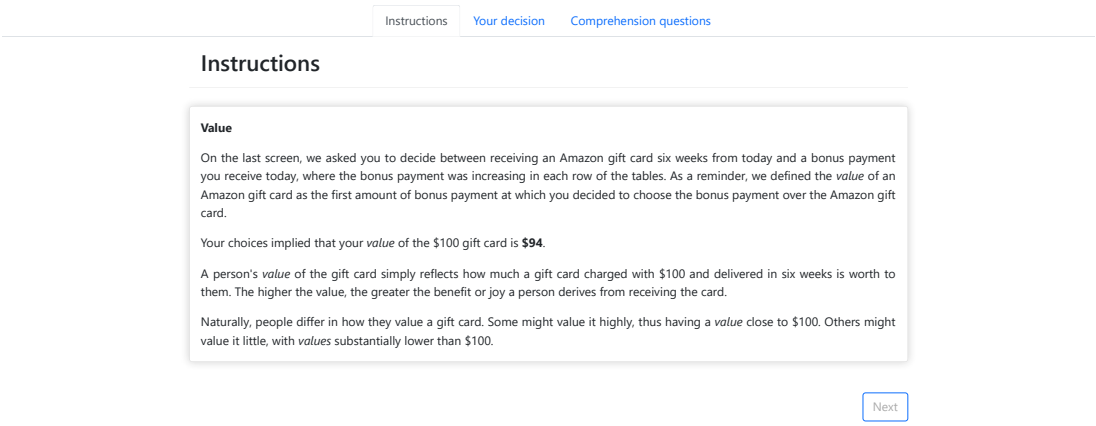


Figure G.104: Avoiding the ask paradigm screen 9

Instructions | Your decision | Comprehension questions

In this part of the study, we ask you to choose repeatedly between two options, Option A (participate in a splitting task where your bonus depends on how you split $100 between yourself and another person) and Option B (do not participate in a splitting task but get the specified amount of bonus), arranged in a table. Each row of the table is a different choice.

Irrespective of what you choose, you will spend 20 seconds on the next page before proceeding:

- If you do not participate in the splitting task, the next page is a waiting page on which you have to stay for 20 seconds.
- If you participate in the splitting task, the next page is the decision page for the splitting task on which you have to stay for 20 seconds. You can also take longer to make your decision.

Option A: Participate in a splitting task

Option A is identical in all rows. If you select Option A, you will subsequently participate in a splitting task: you split $100 paid through Amazon gift cards between yourself and another person. The other person already participated in a previous study and made choices that revealed their *value* of the gift card (as discussed in the previous page). If you participate in the splitting task, the consequences depend on how you split the money.

Consequences of Option A for you (potential bonus payment)

Based on how you split the money, you have the chance to receive a bonus payment paid to you in Dollars today. Your bonus payment is the sum of the gift card money allocated to yourself and the other person, weighted by how much each of you *value* the gift card. That is, the more money you allocate to the individual with the higher *value* of the gift card, the higher your bonus payment.

Example of splitting task

For example, say you allocated $20 to you and $80 to the other person.

> As explained on the previous page, you valued the $100 gift card at $94.0. Suppose the other person valued the gift card at $79.0. Then, you value every dollar received from a gift card at $0.94 ($94.0/$100) and the other person values every dollar at $0.79 ($79.0/$100) on average. Based on those valuations, your bonus payment would be = The value of $20 gift card money to you + The value of $80 gift card money to the other person = $20 × $0.94 + $80 × $0.79 = $18.80 + $63.20 = $82.00.

If you had allocated instead $80 to you and $20 to the other person respectively,

> then your bonus payment would be = $80 × $0.94 + $20 × $0.79 = $75.20 + $15.80 = $91.00.

As you can see, your bonus payment increases as you allocate more to the individual with the higher valuation. In this example, you have the higher valuation.

In the actual task, you do not know whether you or the other person has the higher valuation. Thus, allocating more to you *increases your bonus payment if you have the higher valuation* but *decreases your bonus payment if the other person has the higher valuation*.

Consequences of Option A for others (none)

Important: apart from the potential bonus payment you can earn, the task has no further consequences for anyone. The other person **does not** receive any money from your decision, neither in the form of bonus payments payed through gift cards nor other payments. They will also not learn of your choice or interact with you in any way.

Option B: Do not participate in a splitting task

Option B varies between rows. If you select Option B, you will not participate in the splitting task. That is, you will not be paired with any other participant and you will not split any money or receive payment through it. Instead, you receive the amount specified in the row as bonus payment paid through Amazon gift cards in six weeks from today. The amount you receive under Option B increases as you move down the rows of the table.

Example

Below, you see an example of a table. For instance, the first row of the table asks you to choose between "Split $100 by participating in the splitting task" (Option A) and "Receive $90 as bonus, do not participate in the splitting task" (Option B). If you choose the left option (Option A), it means that you prefer Option A over Option B. If you choose the right option (Option B), it means that you prefer Option B instead.

Option A			Option B
Split **$100** by participating in the splitting task.	○	○	Receive **$90** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$92** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$94** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$96** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$98** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$100** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$102** as bonus, do not participate in the splitting task.
Split **$100** by participating in the splitting task.	○	○	Receive **$104** as bonus, do not participate in the splitting task.

Auto-completion

The table auto-completes your choices, so you don't have to click through all of the rows. If you select Option A in any row, we assume you will also prefer Option A in all rows above that row and auto-complete accordingly. If you select Option B in any one row, we assume that you will also prefer Option B in all rows below that row. You can revise your choice by selecting another Option in a different row.

Consequences

The computer will randomly select one row after you make your decision. If you chose Option A (participate in a splitting task) in the selected row, you will subsequently face the splitting task. If you chose Option B (do not participate in a splitting task) in the selected row, you will accordingly not face the splitting task.

Back | Next

Figure G.105: Avoiding the ask paradigm screen 10

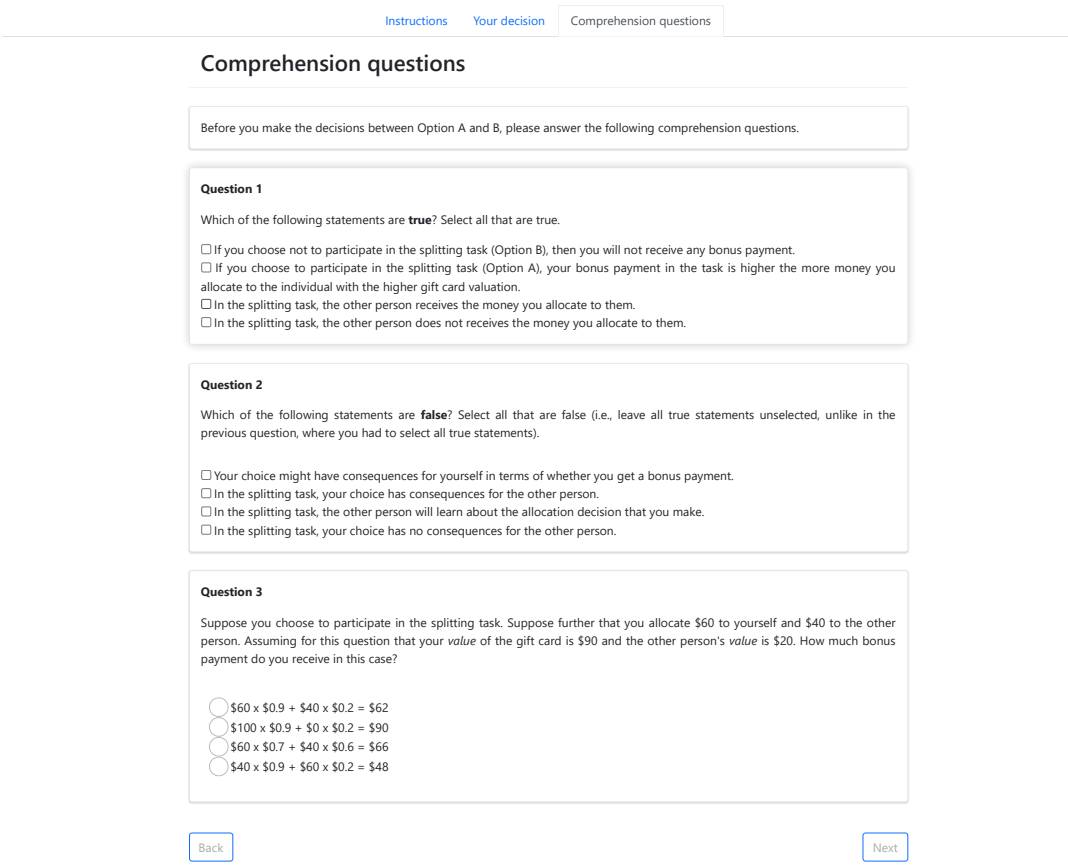


Figure G.106: Avoiding the ask paradigm screen 11

Result

You answers to the comprehension questions still contain errors. Below, we show you the correct answers to the questions.

Question 1. In this question, you had to select all true statements and leave all false statements unselected.

Statement 1: If you choose not to participate in the splitting task (Option B), then you will not receive any bonus payment.
This statement is false. You correctly indicated that the statement is false.

Statement 2: If you choose to participate in the splitting task (Option A), your bonus payment in the task is higher the more money you allocate to the individual with the higher gift card valuation.
This statement is true. You incorrectly indicated that the statement is false.

Statement 3: In the splitting task, the other person receives the money you allocate to them.
This statement is false. You correctly indicated that the statement is false.

Statement 4: In the splitting task, the other person does not receives the money you allocate to them.
This statement is true. You incorrectly indicated that the statement is false.

Question 2. In this question, you had to select all false statements and leave all true statements unselected.

Statement 1: Your choice might have consequences for yourself in terms of whether you get a bonus payment.
This statement is true. You correctly indicated that the statement is true.

Statement 2: In the splitting task, your choice has consequences for the other person.
This statement is false because your choice only has consequences for your bonus payment, not for the other person. You incorrectly indicated that the statement is true.

Statement 3: In the splitting task, the other person will learn about the allocation decision that you make.
This statement is false because the other person will not interact with you in any way, and thus also not learn about your choice. You incorrectly indicated that the statement is true.

Statement 4: In the splitting task, your choice has no consequences for the other person.
This statement is true. You correctly indicated that the statement is true.

Question 3. In this question, you had to select the correct bonus payment that you would receive if you would allocate $60 to yourself and $40 to the other person , assuming that your value of the gift card is $90 and the other person's value is $20.

The correct answer is that you receive $60 x $0.9 + $40 x $0.2 = $62. You correctly selected this answer.

On the next page, you can make your decisions.

Next

Figure G.107: Avoiding the ask paradigm screen 12

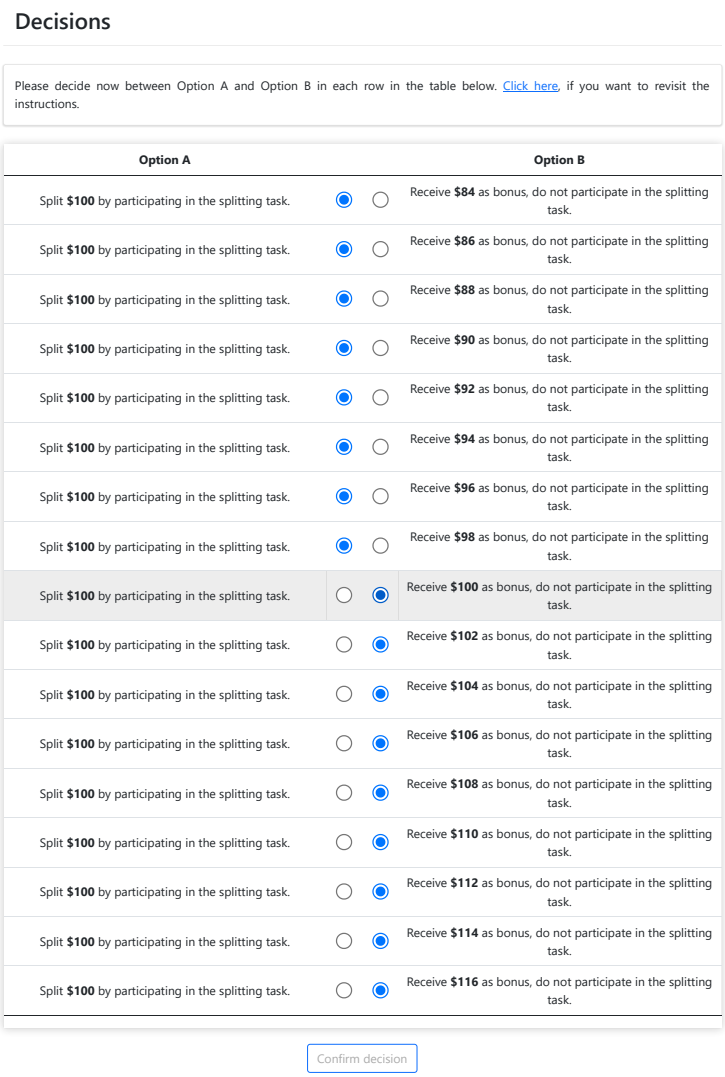


Figure G.108: Avoiding the ask paradigm screen 13