An Experiment on Dilemma Aversion and Information Avoidance

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Abstract

Many people claim to intend to act pro-socially but fail to implement their intention when informing themselves about the consequences of their own action is necessary for a pro-social action. This attitude-behavior-gap is well documented, even in situations where informing can be done without additional costs. One reason for this attitude-behavior gap might be that after being informed the perceived social dilemma is increasing. It might become more obvious that one can not get both an individual and a socially optimal outcome. In this study, I am exploring whether reducing the potential dilemma in the second stage is affecting ignorance behavior in the first stage. Using a novel identification strategy with the disadvantage of a counter-directed confounding factor by defusing the dilemma size, this study finds no evidence for dilemma aversion being an important factor in explaining information avoidance behavior.

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Keywords: willful ignorance, strategic ignorance, conflict aversion, dilemma aversion, trade-off aversion

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1 Introduction

Small changes in consumption choices implemented by enough people have the power to change the world. Indeed, many people claim that they prefer fairly traded and environmentally friendly products. If everybody would follow their claim, we would live in a more sustainable world. Sometimes this claim, however, is not reflected in observed behavior—a phenomenon known as the attitude-behavior gap.[1]

One reason for this gap might be that people are not aware of the consequences of their choices. They may even prefer it to stay that way. In other words, they are vaguely aware that once they have informed themselves, they can no longer, with a good conscience, buy what otherwise seems like a very attractive option. Indeed, Dana et al. (2007) provide experimental evidence that up to 46% of subjects do not inform themselves about the potentially negative consequences of their choices on others—even if they could do so with one mouse click. This observation of information avoidance has been replicated in multiple studies (Larson and Capra, 2009; Matthey and Regner, 2011; Feiler, 2014; Grossman, 2014; Kajackaite, 2015; Spiekermann and Weiss, 2016; Grossman and Van Der Weele, 2017; Exley and Kessler, 2021).[2] In their recent study, Exley and Kessler (2021) find that self-image concerns align with Grossman and Van Der Weele (2017) indeed are relevant for a substantial share of ignorance behavior. However, a large share of the observed ignorance is still unexplained. The question of what other mechanisms are causing the ignorance behavior remains. One possible explanation is the aversion to being in a social dilemma situation in which one has to decide between an individual and socially optimal option. I might want to buy a car and can choose between a combustion engine or a plug-in car. The electronic plug-in solution comes at higher individual costs. For an uninformed person, there might be uncertainty about which of the two is socially (environmentally) better. When informing, one enters a situation in which one with

[1] see Carrington et al. (2014), Hassan et al. (2016) and Farjam et al. (2019) for evidence on intention-behavior-gaps and consumer behavior.

[2] Similar observations have been made in replications with different paradigms (Andreoni et al., 2017; DellaVigna et al., 2012; Ganguly and Tasoff, 2017; Knutsson et al., 2013; Serra-Garcia and Szech, 2022; Li et al., 2021; Thunström et al., 2021).

certainty might not reach both an individual and a socially optimal solution at the same time. Not acquiring information can help avoid such a situation, as one can not be sure that the individually optimal option is not also socially optimal. Thus, an aversion to such a social dilemma could explain why people avoid information, potentially revealing a dilemma.

This study presents a simple experiment that builds on Dana et al. (2007) and tests whether defusing the social dilemma affects information avoidance behavior. By doing this in a neutral anonymous laboratory setting, the possibility that the decision-maker feels personally pressured and possible confounding peer group effects are eliminated.[3]

Next, the study describes why dilemma aversion might be a relevant factor for information avoidance. Consider a situation in which an individual has to choose between at least one individual better and one socially better option. A social dilemma is defined as one that can not reach both the individual and the socially better solution simultaneously. Similarly, in the decision of which engine to use, I can either spend less money or can choose an environmentally friendly car, but I can not save money and be environmentally friendly.

The following section presents different arguments why being in a dilemma comes at psychological costs.

In a dilemma situation, the two options can be interpreted as reference points for the reachable egoistic or social utility. Not reaching these reference points can, for different arguments, come with psychological costs. Sarver (2008) argues that people anticipate regret as either the egoistic or the social part of oneself will not reach the reference point. In a social dilemma, people will regret not being social or not maximizing their payoff. In our example, I might regret spending more money or not choosing an environmentally friendly car. Building on Sarver (2008), Toussaert (2018) states that agents have two tempting options in a dilemma situation. One option is more tempting for the egoistic self, and one option is more tempting for the social self. Even if one option is preferred, the existence of the other might causes

[3]An exploratory theoretical description of why dilemma aversion could affect information acquisition can be found in the appendix.

psychological costs of control. Similar Woolley and Risen (2018) argue that avoiding information can help to protect initial preferences. Dwenger et al. (2018) describe that people are averse to responsibility as they do not want to be causal for a bad outcome or, as put by Leonhardt et al. (2011), that people want to minimize one's causal role in determining an outcome. Similar Le Lec and Tarroux (2020) argue that agents fear making a wrong decision in a dilemma as they may account for a future change in their preferences. Avoiding a dilemma situation in which no clear best option exists can help avoid being responsible for a decision that ex-post would be judged as wrong. Grossman and Van Der Weele (2017) describes that in his self-image model in equilibrium, some subjects do not reveal information because of a fear of being in a trade-off situation. A more classical economic argument might be that in a social dilemma, acting selfishly causes opportunity costs of not implementing the optimal social option and vice versa.

Overall, there are several reasons why being in a dilemma could cause psychological costs. Intuitively, the costs of being in a dilemma may depend on the size. It might be acceptable to be in a minor dilemma. If the dilemma size increases, one might want to avoid the situation. Hence, reducing a dilemma might also reduce mental costs connected with being in the dilemma situation. To explore how dilemma costs affect the decision not to inform oneself, I will discuss how being informed can affect the dilemma. If a person willfully closes her eyes to the consequences and does not inform herself, she can ignore the social optimal reference point. This ignorance allows behaving as if the dilemma would not exist. Put differently when being able to deceive oneself, by ignoring or informing, one can decide whether to play a game with or without a perceived dilemma situation. Thus, if a person does not like to be in a social dilemma and informing herself reveals the social dilemma, this person may decide to rather stay uninformed because of her dilemma aversion[4]. Clearly, this self-serving evaluation of the dilemma builds on

[4]This avoidance mechanism is similar to the behavior observed by Dwenger et al. (2018), who find that some people prefer flipping a coin instead of making a decision. Flipping a coin and avoiding information is instrumental in reducing the mental costs of deciding on a dilemma situation.

the ability to fool oneself, as the dilemma does not disappear. Ignoring information just helps to avoid certainty about the situation.[5]

Agents suffering additional costs from dilemma information is in line with Golman et al. (2021). They argue that people are motivated to avoid information because they do not want to learn possible bad news, such as being in a dilemma situation. Similar Exley and Kessler (2021) and in their earlier paper Golman et al. (2017) mention an aversion to learning bad news and an aversion to being disappointed in interpersonal trade-off situations. Jarke-Neuert and Lohse (2022) describes this as conflict aversion.

To test whether dilemma aversion can explain ignorance behavior, an experimental study in which the size of the dilemma is varied is conducted. In the study, a decider can choose between two options. The outcome of the option for herself is known. The outcome for a second player is hidden, but the information can be freely requested. Importantly, it might be that after learning the outcome, the decider is in a social dilemma situation, in which she can decide to let go own payoff in order to help the second person. The treatment variations, using two different approaches, defuse the worst possible outcome and thereby defuse the size of the dilemma in the game. In the DEFUSE treatment in the dilemma situation, the payoff for the passive player when acting selfish is increased. In the MEDIOCRE treatment, a third option is added to the game, which uses the same payoff as in the DEFUSE treatment and dominates the worst option.

After informing, in the treatments, one can no longer end up in an unpleasant situation with the highest possible dilemma. Instead, the potentially resulting dilemma after informing is smaller as the social loss for the selfish option is reduced. The potential regret of not acting pro-social and the external effect for which one may feel responsible is reduced.

Looking at the arguments by Dwenger et al. (2018) and Leonhardt et al. (2011),

[5]The core ingredient is that not informing about the consequences reduces the perceived costs of being in a dilemma. This could also be due to a self-serving interpretation of uncertainty such that possible costs of not reaching an uncertain reference point are perceived as less painful. Alternatively, it could be that subjects can, instead of accounting for the expected costs of the dilemma under uncertainty, account for the costs of being in an expected dilemma.

information avoidance was instrumental in not being causally responsible for a bad outcome. As the worst outcome becomes defused, the instrumental value of ignoring information also reduces. This is in line with Retief et al. (2013), who finds that the more similar alternatives are, the easier is the trade-off decision perceived. Here it is important to disentangle that Retief et al. (2013) by describing a decision as easy refers to additional psychological costs, not costs of deciding what to do. For example, if two options are very similar, one may need to think harder about which is better in line with the own preferences. To illustrate the reduced dilemma, let us look at the implemented payoffs. In the baseline game, behaving selfishly comes at a social loss of 30 cents. In the game with the defused option, selfish behavior results in a social loss of 10 cents. The potential harm is reduced in the defused variants while the costs of pro-social actions are constant. Thus, the dilemma should be smaller compared to the baseline game.

If less information avoidance can be observed in one of the treatments with the defused options, this hints that dilemma aversion might be a driver of willful ignorant behavior.

Implementing two treatments to reduce the dilemma accounts for possible confounding factors directed in the opposite direction. These factors would hide the pure effect of a defused dilemma. In the DEFUSE treatment, the dilemma costs and the potential benefit of informing are reduced. Helping the passive player becomes less important, and one can not, to the same degree, benefit anymore from a higher self-image because of being prosocial. The possible benefit from a higher image level and also the possible benefit from prosocial preference decreases. This confounding factor should decrease information acquisition.

In comparison in the MEDIOCRE treatment, the worst option still exists as a reference point. Because of the existence of the reference point, looking at possible benefits from image concerns and prosocial behavior, the situation seems to be more comparable to the baseline. This could mean that the possible contrary confounding factor is smaller compared to the DEFUSE treatment. On the other side, having three options could increase the decision costs as decisions with wider choice sets

cause mental costs. Increasing the decision costs should cause subjects to inform themselves less often and instead make a decision directly. Also, the third option could be used as wiggle room to excuse not informing by directly choosing a mediocre option. This argument is in line with Engel and Szech (2020), who describe that many people act pro-socially not because they want to be prosocial but because they do not want to be selfish. Subjects might be happy with just avoiding the worst option, and thus informing is no longer necessary.

Being aware of the potential confounding factors working against the positive effect of a reduced dilemma, conducting two treatments with different confounding factors increases the chance of observing a potential effect. Not being able to ex-ante estimate the potential counter-directed-effect sizes, the design might fail to find evidence for the role of dilemma aversion on information avoidance.

1.1 Contribution to Literature

The paper contributes to the research on information avoidance, which is part of the growing field of moral decision-making within economics. The starting point for many studies on information avoidance is Dana et al. (2007). They are the first to find evidence of information avoidance and its harmful effect on welfare in a controlled environment. Most studies still build on the core experimental design used by Dana et al. (2007).

Trying better to understand the ignorance behavior Grossman (2014) shows that the design of how one can reveal information strongly affects the ignorance behavior. Subjects react to default effects and are more likely to ignore information if they can do so by passively not revealing instead of actively avoiding information. Grossman and Van Der Weele (2017) argue that image concerns are an important factor in explaining ignorance behavior. However, Exley and Kessler (2021) show that there is still a large share of unexplained ignorance behavior. They raise the question of which other mechanisms drive ignorant behavior. This paper directly responds to their question and explores whether dilemma aversion and a dilemma's size can explain some of the ignorance behavior.

The closest studies to this paper are Exley and Kessler (2021) and Jarke-Neuert and Lohse (2022). Similar to the approach in this paper Exley and Kessler (2021) explore the role of interpersonal trade-offs. In one of their treatments, they adapt the game's payoff structure such that the interests are always aligned after informing. Thereby, they eliminate potential dilemma costs. They observe a significant reduction in information avoidance. Whether the reduction directly mirrors information avoidance or is confounded by other factors is less clear. Due to the change in the payoffs, the characteristic of the game changed. It is no longer a typical dictator game variant, as acting pro-social is free of cost. Also, it needs to be made clear how other motives as image effects or information curiosity, are affected. Looking at Exley and Kessler (2021), I interpret their results as an important first step. In comparison, the experimental design in this study does not vary the nature of the dictator game and could better attribute observed effects to manipulating the dilemma size. Similar Jarke-Neuert and Lohse (2022) argue that conflict aversion can explain ignorance. By observing clicking times, they argue that subjects make quick decisions not to inform to avoid a more time-demanding dilemma situation. In their follow-up experiment, they additionally flip that the decider is aware of the payoff for the passive person but not for herself. They argue that in such a scenario, image concerns should no longer matter and explain the still observed ignorance by avoiding conflicting situations. In principle, I share the interpretation of their results as an indicator of conflict aversion. However, given that the study was conducted as an online experiment and had less control, it might be that a part of the remaining ignorance can be attributed to error-like motives such as confusion or inattention. Different from both Exley and Kessler (2021) and Jarke-Neuert and Lohse (2022), the identification in this study is not based on excluding other motives such that only dilemma aversion is left, but on reducing the dilemma and holding the other motives as good as possible constant. In comparison, this approach is robust towards a constant unknown baseline ignorance rate due to error-like motives.

2 Experimental Design

At the core of the experiment are one dictatorial choice and the decision to inform oneself about the consequences of the choice. First, the BASELINE treatment, which replicates the hidden information treatment by Dana et al. (2007), and next, the treatments DEFUSE and MEDIOCRE are described. Being more specific for the replication, this study follows the design and wording by Exley and Kessler (2021), who also conducted the experiment online and used a similar experimental software. The variables of interest are whether subjects inform themselves and whether subjects choose the more welfare optimal allocation.[6]

2.1 Baseline - Replication

Subjects form groups of two. One is the actively dictating player 'D,' and the other becomes the passively receiving player 'R'. Both act as if they are in the active role and only at the end of the experiment learn their actual role. The decisions of the active subject are relevant for both. The dictatorial decision can determine the payoff for oneself and the other subject. The decision is a binary choice problem in which the payoff for the active player is known for both options. The options are neutrally framed as 'A' and 'B'. By choosing 'A', the active player receives 60 cents; by choosing 'B', she receives 50 cents. The consequences of the decision on the passive player differ with the state of the world. In the first possible state, the passive player receives 50 cents if 'A' is chosen and 10 cents if 'B' is chosen. In the second possible state of the world, the payoffs are symmetrically switched. In the second possible state, the passive player receives 10 cents if 'A' is chosen and 50 cents if 'B' is chosen. The two possible states of the world are referred to as aligned interests (AI) and conflicting interests (CI).

At the beginning of the experiment, the active player does not know which state of the world is relevant. But she can access this information without having any

[6]Same as Exley and Kessler (2021), this study uses small stakes and is a rather short experiment. As shown in previous studies on ignorance behavior, online experiments with small stakes will usually also replicate with larger stakes when conducted in the laboratory.

monetary costs by clicking on a button. It is known that both states can be relevant with a probability of 50%. Using this design allows us to observe the share of subjects who inform themselves about the possible consequences of their own choice on the other subject and, at the same time to observe the share of subjects who do not inform themselves. To ensure a sufficient understanding of the experiment, subjects receive detailed instructions and have to answer questions on the instructions. Table 1 presents the payoff structure.

Table 1: Payoffs in baseline Hidden Information Game

	Unknown state: (AI or CI)	Aligned Interests (AI)	Conflicting Interests (CI)
A	60;?	60;50	60;10
B	50;?	50;10	50;50

Note. The first number represents D's material payoff, the second that of the passive player R.

The extensive form of the game is represented by the tree diagram in Figure 1.

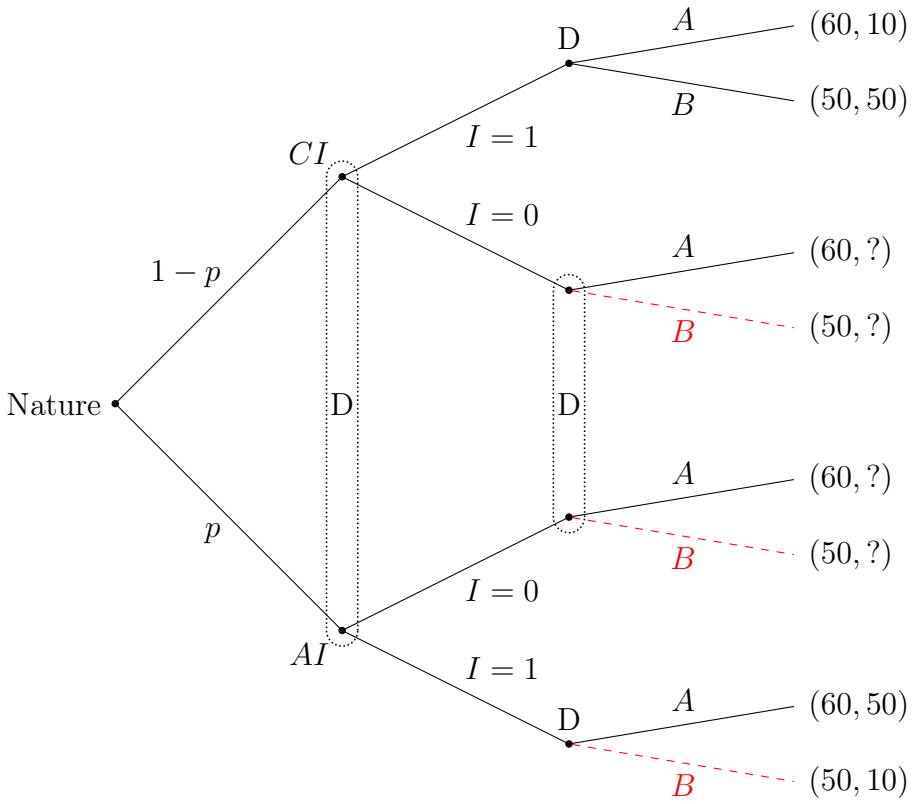

Figure 1: D's problem in the baseline treatment as a game against nature; the first number represents D's material payoff, the second that of the passive player R.

First, nature draws whether the state of the world is aligned and $W = -w$ or conflicting and $W = w$. Being unaware of the true state, player D decides to learn the relevant state ($I = 1$) or not ($I = 0$). Assuming D to not always be purely selfish dominated paths are marked by a red dotted line. Option' B' is always dominated when being in the aligned state or when not informed. The information set for non-informers is the same - independent of the real state of the world. In such a situation, a somehow rational agent would, under normal conditions, not choose the dominated option 'B'. The only unlikely exception might be an agent with anti-social preferences. Such an agent might be willing to let go own payoff to decrease the other player's payoff. Only after informing and being in the conflicting interests state the agent faces a dilemma situation. Both choosing 'B' or 'A' can be reasonable.

2.2 Treatment: Defusing the Dilemma

In the treatment group, the subjects are in the same situation as in the baseline. The only difference compared to the baseline is that the subjects have a defused worst possible outcome. The lowest possible outcome for the passive player increases from 10 cents to 30 cents. The payoff scheme is presented in Table 2.

Table 2: Payoffs in the Hidden Information Game with defused Option

	Hidden State: (AI or CI)	Aligned Interests (AI)	Conflicting Interests (CI)
A	60;?	60;50	60;30
B	50;?	50;30	50;50

Note. The first number represents D's material payoff, the second that of the passive player R.

From the perspective of the active decision-maker, two mechanisms are affected by this change. First, the relative added utility of acting prosocial is reduced. This might reduce the willingness to inform oneself as subjects now can argue that there is no big need to reveal the relevant situation anymore. In contrast, the dilemma situation after informing is defused. If subjects in the baseline avoid information because of the fear of ending up in a dilemma and this effect is bigger than a possible

contrary effect, more subjects should reveal the information in the defused situation.

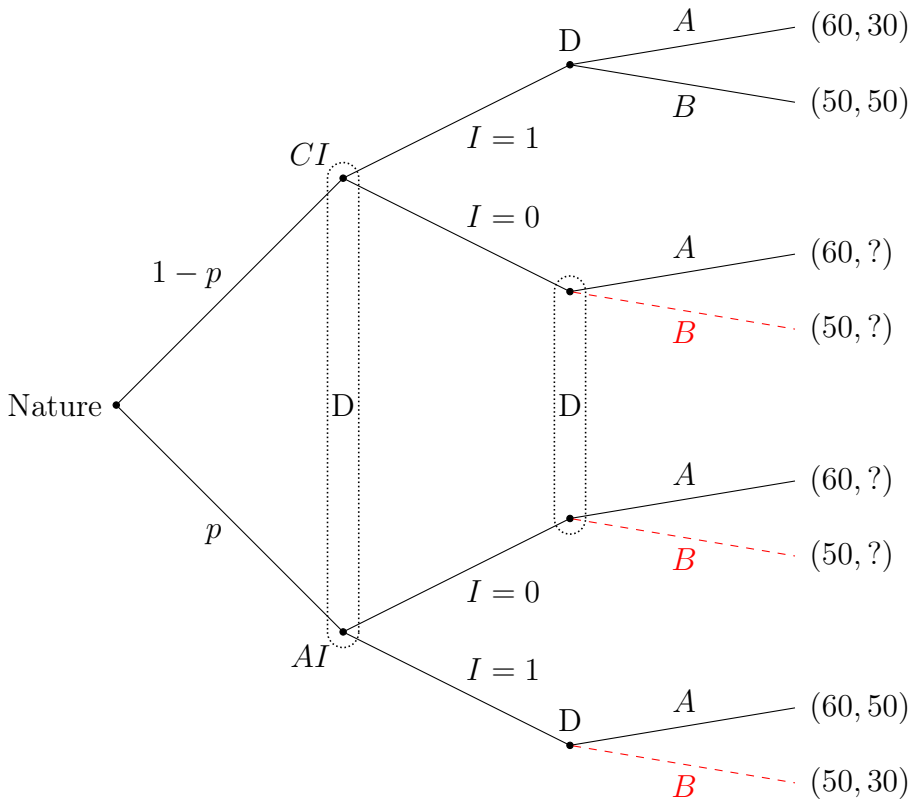

Figure 2: D's problem in the DEFUSE treatment as a game against nature; the first number represents D's material payoff, the second that of the passive player R.

Figure 2 represents the structure in the defused game. Dominated paths are indicated by red dotted color. Assuming non-anti-social preference, the strategies for all sub-games other than the situation in which the agent informs herself and face the conflicting situation should not be affected. When not informing, option 'B' is dominated by 'A'. After informing, one would choose option 'A' in the aligned state or face the conflicting state. On the choice level, this is the only sub-game that could be affected as the dilemma in the situation is defused compared to the baseline.

2.3 Treatment: Adding a Mediocre Option

In the treatment group, the subjects are in the same situation as in the baseline. The only difference compared to the baseline is that the subjects have an additional

mediocre option 'C'. Other than for the two initial options, 'A' and 'B', the payoff for the passive player in the mediocre option 'C' is fixed. Player D's payoff is 60 cents, and the payoff for the passive player R is 30 cents, as displayed in Table 3.

Table 3: Payoff in the Hidden Information Game with Mediocre Option

	Hidden State: (AI or CI)	Aligned Interests (AI)	Conflicting Interests (CI)
A	60;?	60;50	60;10
B	50;?	50;10	50;50
C	60;30	60;30	60;30

Note. The first number represents D's material payoff, the second that of the passive player R.

The mediocre option 'C' can, independently of the state of the world, be selected. Figure 3 represents the structure in the mediocre game.

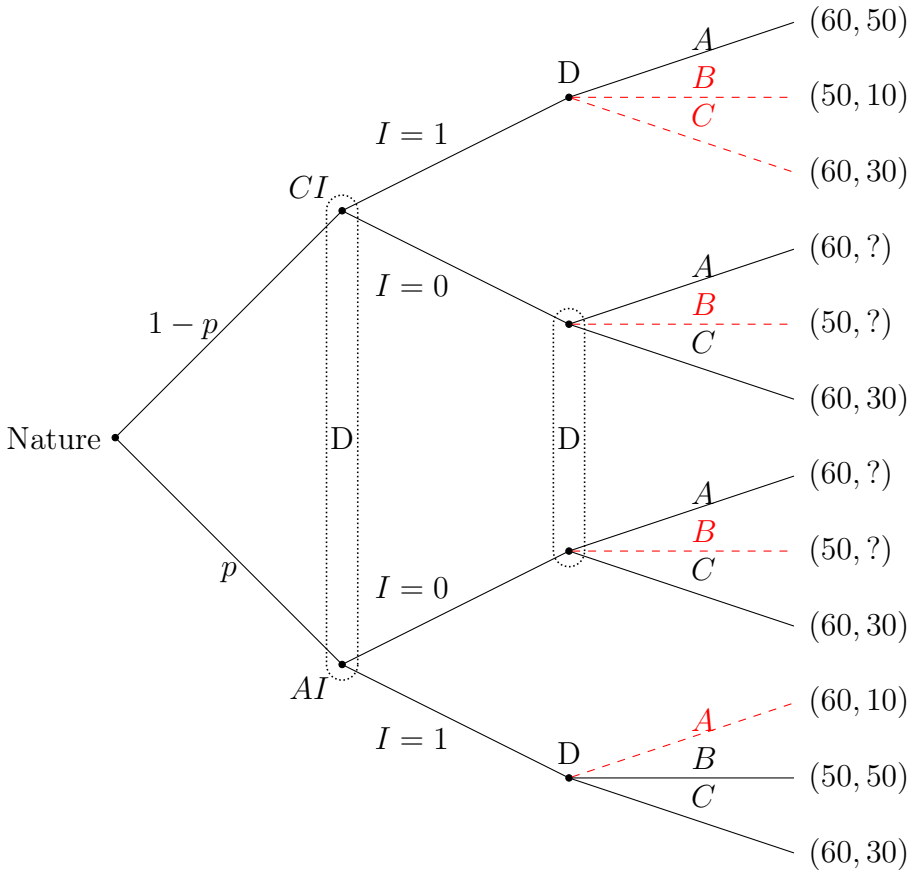

Figure 3: D's problem in the MEDIOCRE treatment as a game against nature; the first number represents D's material payoff, the second that of the passive player R.

Dominated paths are indicated by red color. In expected values, the mediocre

option is identical to option 'A' before revealing the state of the world. From a joint payoff perspective, the mediocre option is always dominated by one other option and is also always dominating the least attractive option. When not informing, option 'B' is dominated by option 'A'. Note that depending on the risk preferences, either option 'C' or option 'A' is at least weakly dominating the other option. Risk-averse agents would choose option 'C' and risk-loving agents option 'A'. Risk-neutral agents are indifferent. After informing, one would either choose option 'B' or 'C' in the conflicting state or option 'A' in the aligned state.

2.4 Additional Measures

Supplementary to the core experiment, subjects are asked for demographics, and a conflict avoidance scale based on Goldstein (1999) is elicited. Subjects are confronted with 15 statements and have to state how much they agree with each statement. Additionally, the time spent on each page is recorded. This allows learning whether subjects made decisions directly or spent time on a page.

2.5 Behavioral Predictions

I will first describe the behavioral predictions about the pro-social choice selected depending on the information available in the baseline and discuss how the predictions differ for the treatment variations. Note that the costs of being a dilemma or costs of revealing information for these decisions are either not existing or are sunk costs and should not be regarded. In the next step, I will describe predictions about information acquisition decisions and how they differ between the treatments.

For uninformed subjects, I can make a clear prediction. Subjects should not choose option B. The expected payoff for the passive person from choosing any option is the same. Thus, while remaining uninformed, one should be indifferent between both options. Looking at the own payoff, one can only reduce the payoff by choosing option B. Taken together, option B is weakly dominated and should not be chosen. The predictions hold for the BASELINE and the DEFUSE treatment.

In the MEDIOCRE treatment, uninformed subjects might - depending on their risk preference - prefer the additional option C over option A or the other way around. Assuming that most subjects are risk-averse, I expect more subjects to prefer option C.

Hypothesis 1. *In the BASELINE and in the DEFUSE treatment, uninformed subjects will prefer option A over option B. In the MEDIOCRE treatment, uninformed subjects will either choose option A or C but not option B.*

Looking at subjects who revealed the information and are in the aligned interests situation, again, a dominant option exists in all treatments. Option A maximizes both the individual and the joint payoffs.

Hypothesis 2. *In all treatments, informed subjects with aligned interests will prefer option A.*

Informed subjects in the conflicting state should, depending on the strength of their social preferences, in the BASELINE either choose option A or option B. Selfish subjects will maximize their payoff by choosing option A. Prosocial subjects might choose option B if the social benefits exceed the costs.

Let us assume that the group of informed subjects has similar characteristics between the treatments. The prosocial value of choosing option B is decreased in the DEFUSE and the MEDIOCRE treatment. This might cause subjects to more often choose the selfish option A in the DEFUSE treatment and option C in the MEDIOCRE treatment.

Hypothesis 3. *Based on the assumption that the informed group between treatments has a similar prosocial level, subjects in the DEFUSE and the MEDIOCRE treatment should less often choose the prosocial option B compared to the BASELINE.*

The assumption that the average characteristics and strength of social preferences within the informed groups do not differ between the treatments has to be critically reviewed. Clearly, this depends on information acquisition behavior and how prosocial subjects sort themselves into informers and non-informers.

Let us now focus on the decision to reveal information or to remain uninformed. Assuming that subjects have heterogeneous social preferences and heterogeneous levels of dilemma aversion, the share of information avoidance in the BASELINE treatment is used as the benchmark ignorance rate. This benchmark should be similar to the share of information avoidance behavior in other replications. Importantly not all subjects should inform themselves, and some subjects which inform themselves do not choose the prosocial option. Two contrary effects can be expected in the DEFUSE and the MEDIOCRE treatment. The dilemma size is reduced. This should promote information acquisition. But due to the possible contrary directed confounding factors, one would expect less information acquisition.

Being agnostic about potential effect sizes, the design is based on the optimistic belief that the positive effect of reducing the dilemma in one of the treatments would outweigh the contrary adverse effects. If this study observes a significant reduction in information avoidance in either of the treatments, this would be a strong indicator that dilemma aversion is an important driver of information avoidance behavior.

Hypothesis 4. *Less subjects should remain uninformed in the DEFUSE treatment compared with the BASELINE.*

Hypothesis 5. *Less subjects should remain uninformed in the MEDIOCRE treatment compared with the BASELINE.*

The overall effect on prosocial behavior depends on how many subjects decide to inform themselves and how often the informed group behaves in a prosocial way. As a consequence of turning the before dilemma-avers-driven non-informers into informers, one could expect more prosocial behavior. In contrast, in the group of informed subjects with conflicting interests, fewer subjects might choose the prosocial option (see Hypothesis 3). Not knowing possible effect sizes, I can only make some conditional predictions about the overall share of prosocial behavior. If subjects in the treatments more often reveal the information, I can not make any prediction. If in contrast, subjects do not reveal the information more often in line with Hypothesis 3, fewer subjects should choose the prosocial action.

2.6 Experimental Procedures

The experiment was conducted as an online experiment supported by the Business and Economics Laboratory (BaER-Lab) of the Paderborn University. The sessions took place between June and September 2022. All sessions were conducted using the experimental software Otree (Chen et al., 2016). Subjects are recruited using Prolific.[7] The decisions were taken anonymously. Additionally, demographics using a short questionnaire after the experiment are elicited. The average participation lasted 5-7 minutes, and the average earnings were 1.25 GBP, including a baseline fee of 0.75 cents. This results in 10.70 GBP/hour. The experiment was approved by the ethical board of the Paderborn University and preregistered using the American Economic Association's registry for randomized controlled trials (AEARCTR-0009057).

3 Results

The results are structured into three subsections. Section 3.1 presents demographics and randomization checks. Section 3.2 will investigate the choice behavior predicted by hypotheses 1-3. Section 3.3 presents the main result by exploring whether information behavior is affected by the treatments as predicted by hypotheses 4 and 5. Section 3.4 will analyze the overall welfare effect by testing whether the treatments affect the share of prosocial behavior. Section 3.5 will examine additional measures based on the questionnaire and the decision time.

3.1 Demographic Statistics and Randomization Checks

The study consists of 7 sessions with a total of 688 subjects. The subjects were randomly assigned to treatments, as all treatments took place simultaneously. Most of the subjects were non-students. 102 were students, and 33 of them considered themselves as graduated students. 2.3% of the subjects reported studying economics. The average age was 38 years. 51% of the subjects have been female and 48% male.

[7] As participating criteria, subjects should be fluent in English speaking, be located in the UK, and have a 90% approval rating or better.

1% selected the option 'other'. Table 4 reports the demographic characteristics by treatment. To check whether the characteristics are equally distributed between the treatment samples, Pearson χ^2 tests are conducted.

Table 4: Randomization Check

	BASELINE (n=225)	DEFUSE (n=238)	MEDIOCRE (n=225)	p-value
Female	.53	.52	.48	.834
Students	.16	.16	.14	.752
Econ. students	.01	.03	.03	.475
Age	38.5	38.1	38.4	.055
Conflict avoidance	20.3	19.6	19.7	.854
Observations	225	238	225	

Note. As a result of participants, who logged in via prolific but did not complete the study, the observations per treatment differ. There seems to be no selection, as the dropping-out rate was independent of the randomly assigned treatment.

According to the data, the randomization seems to have worked. Only looking at age, the difference seems to be weakly significant. The mean age, however, is similar across all treatments. The subjects do not significantly differ by any other demographic characteristic. Similarly, the observed conflict avoidance level is not significantly different across the treatments.

3.2 Effect on Prosocial Choice Behavior

In this section, I will structured by the available information sets, explore the subjects' behavior in the experiment. Table 5 presents the choices of subjects who do not reveal the information in the game. For these uninformed subjects' choices, A and C maximize their own and the other expected payoff.

Following from Hypothesis 1, uninformed subjects should prefer all other available choices over B. However, in the data across all treatments, some non-rational behavior of reducing the own payoff without any expected external effect can be observed. One explanation would be erratic behavior or a missing understanding of the experiment. However, this should be prevented by using understanding questions at the beginning of the experiment. Comparing the behavior of the BASE-

Table 5: Share of choices by non-informed subjects by treatment

	BASELINE	DEFUSE	MEDIOCRE
A	.76	.79	.30
B	.24	.21	.24
C	-	-	.46
Observations	74	94	90

Note. Option C was only available in the MEDIOCRE treatment. The number of observations results from the information acquisition behavior across the treatments.

LINE with the other treatments, the share of irrational selecting choice B is not significantly different from the MEDIOCRE (Fisher's exact p-value>.99) and the DEFUSE treatment (Fisher's exact p-value=.711). This hints that whatever the reason for the observed irrational behavior might be, the treatments do not affect this reason.

Result 1. *Most uninformed subjects make an individual and joint optimal choice. However, in the experiment, a minority of 21%-24% act irrationally. The share of irrational behavior seems to be not affected by the treatments.*

The fraction of irrational behavior is slightly above Grossman and Van Der Weele (2017), who reports a share of 15% in a laboratory setting. An explanation for the difference might be that subjects in the laboratory show less inattention and, thus, are less prone to irrational behavior. To further explore the irrational behavior, I use the tracked time per experimental page and the number of attempts to answer the control questions. Subjects who make an irrational choice spend on average 45 seconds more on the instructions compared to 158 seconds of the other subjects (Pearson χ^2 p-value: .053). Looking at the number of false attempts to answer the control questions, the more false attempts a subject needs, the more likely she will make an irrational choice (Pearson χ^2 p-value: .033). This hints that the irrational behavior, even though using control questions, is driven by a missing understanding of the game or by inattention and should be interpreted as an error-like behavior.[8]

[8]For details on irrational choices and the number of false attempts, see Table 9 and for details on irrational choices and time spent per page, see Table 10 in the appendix.

Following from Hypothesis 2, for subjects who reveal the information and learn that they are in the aligned interest situation, independent of the treatment, this group of subjects should always choose option A. Looking at Table 6, the observed behavior nearly perfectly matches my prediction. Only 4 of 199 subjects in this group did not select option A. In contrast to the uninformed group, this very small number of unexpected behavior indicates that subjects which inform themselves are not acting erratically.

Table 6: Share of choices by informed subjects in the aligned interests situation

	BASELINE	DEFUSE	MEDIOCRE
A	.97	1.00	.97
B	.03	.00	.00
C	-	-	.03
Observations	66	60	73

Result 2. *In all treatments, nearly all informed subjects in the aligned situation select the individual and also welfare optimal choice A.*

This observation is an important finding for further interpretation of the choices, as one can conclude that most informed subjects follow some rational reasoning and do not act erratically. This conclusion should also hold for informed subjects with conflicting interests.

As a preliminary condition for Hypothesis 3, some subjects in the conflicting situation choose the prosocial option B, and some the selfish option A. Table 7 presents the share of choices for informed subjects with conflicting interests on the treatment level.

Table 7: Share of choices by informed subjects in the conflicting interests situation

	BASELINE	DEFUSE	MEDIOCRE
A	.21	.30	.03
B	.79	.70	.52
C	-	-	.45
Observations	68	71	75

Option A represents the individual optimal choice in the BASELINE and the DEFUSE treatment. In the MEDIOCRE treatment, options A and C could be individually optimal. Across all treatments, option B in this situation with conflicting interests is the prosocial option. As shown in Table 7 most subjects in the MEDIOCRE treatment either choose option B or C. If subjects could help the other person without costs, nearly all subjects (73/75) at least decide to choose the free but already welfare-creating choice. Figure 4 presents how much subjects have been willing to not only create welfare at no costs but even to reduce their own payoff to help the other subject.

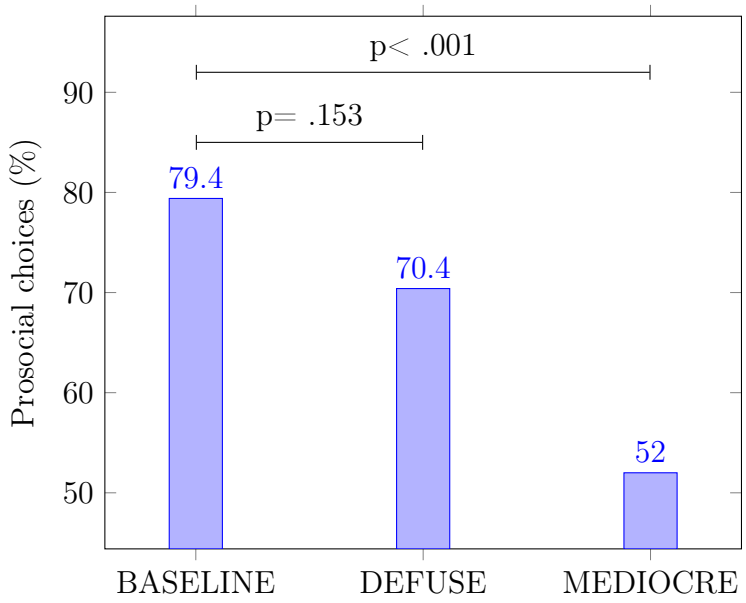

Figure 4: Share of prosocial choices in the group of informed subjects with conflicting interests by treatment

In the BASELINE, 79.4% of the subjects selected to choose the prosocial option. The fraction of people decreases non-significantly (one-sided Fisher's exact p-value= .153) to 70.4% in the DEFUSE treatment. In the MEDIOCRE treatment, the fraction reduces significantly (one-sided Fisher's exact p-value<.001) to 52%. This reduction aligns with Hypothesis 3.

Result 3. *In both treatments, informed subjects in the conflicting interests situation less often choose the prosocial choice B compared with the BASELINE. This reduction is not significant for the DEFUSE treatment(p=.153) and highly significant in*

the MEDIOCRE treatment($p<.001$).

Comparing the DEFUSE and the MEDIOCRE treatment, in both treatments the subjects could choose (60;30) or (50;50). The only difference in the MEDIOCRE treatment is the existence of the dominated option (60;10). An interesting side result is that the existence of the dominated option seems to strongly influence the behavior. Compared to the additional option, fewer people are willing to act prosocially by choosing B. Given the experimental design and the data, I can only speculate about the relevant mechanism explaining the difference. One explanation in line with Engel and Szech (2020) is that subjects do not act prosocial because of their altruistic motivation. They just do not want to pick the worst option. This would allow subjects in the MEDIOCRE treatment to, by choosing option C, not pick the costly prosocial option while simultaneously avoiding the worst option. An alternative explanation can be a surprisingly strong decoy effect.

3.3 Effect on Information Acquisition and Avoidance

Let us, in the next step, focus on information avoidance behavior. Relating the data in the BASELINE treatment to existing studies on information avoidance, the observed ignorance rate of 35.6% is in the normal range, and thus the replication was successful. However, the rate is relatively low, which makes it hard to decrease the rate further, as intended in this study.[9]

The study aims to provide evidence that dilemma avoidance is a driving factor for information avoidance behavior. If either Hypothesis 4 or Hypothesis 5 hold, this evidence would be provided. Figure 5 presents the share of information avoiding subjects by treatments.

One can already see that the share of information avoidance is not reduced in the DEFUSE and the MEDIOCRE treatment. At most, the data indicates a negative treatment effect such that more information avoidance can be observed.

[9]One possible explanation for the low rate of information avoidance might be the relatively trained pool of prolific users. Another explanation could be self-selection, as in comparison with other studies clicking through the understanding questions is not possible as subjects were told that if they too often fail to answer the questions, they are not allowed to participate.

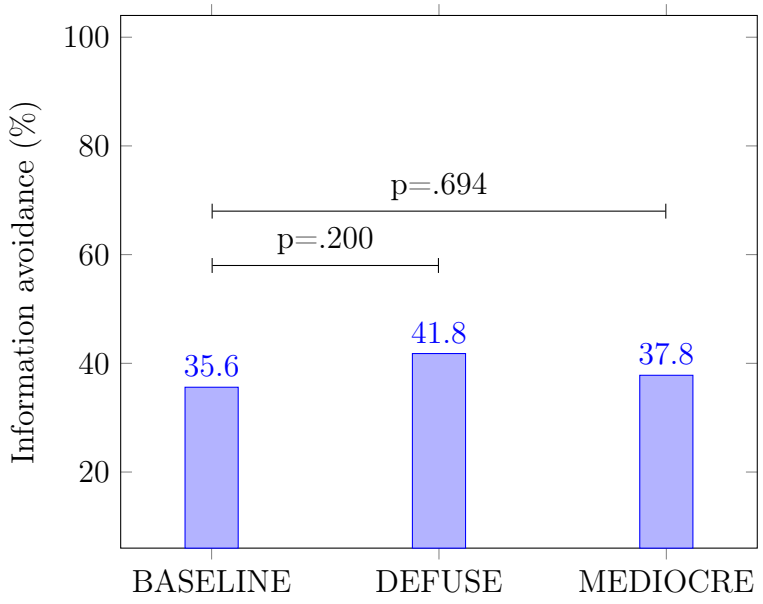

Figure 5: Share of information avoidance by treatment. P-values are calculated using Fisher's exact tests

This negative effect, however, is not significant. It follows that Hypothesis 4 and Hypothesis 5 do not hold and also that this study does not provide evidence that dilemma avoidance can explain information avoidance.[10]

Result 4. *Compared to the BASELINE, the share of information avoidance is not reduced. If at all, more (but not significantly) information avoidance can be observed in both the DEFUSE and the MEDIOCRE treatment.*

3.4 Effect on Joint and Individual Payoffs

This section will evaluate the overall effect on social welfare reflected by the joint payoffs. The potential welfare effect depends on the prosocial behavior of informed subjects, the informing behavior, and also on the absolute payoff structure of the different treatments.

More information acquisition increases the joint payoffs, and more information avoidance decreases the joint payoffs. For illustration, think of a subject which in the BASELINE is not informing herself. She creates with 50% either [60;50] or

[10]To control for demographic effects an additional regression analysis is conducted. The results remain robust. See Table 12 in the appendix.

[60;10] and thus in expectation [60;30]. If the subject informs herself, she would with 50% be in the aligned situation resulting in [60;50] and with 50% in the conflicting situation. If not all informed subjects behave selfishly, the expected joint payoff is bigger for informed subjects compared with uninformed subjects. This relation is displayed in Table 8 and holds across all treatments.

Table 8: Expected joint payoff for prosocial, selfish, and uninformed choices in the conflicting interests situation by treatment

	BASELINE	MEDIOCRE	DEFUSE
Prosocial	105¢	105¢	105¢
Selfish	90¢	100¢	100¢
Uninformed	90¢	90¢	100¢

Note. The Table reports the expected joint payoff of the active and the passive player for an informed prosocial, an informed selfish, and an uninformed subject by treatment. The calculation accounts for aligned and conflicting interests being equally likely.

Clearly, the expected joint payoffs are affected by the absolute change of payoffs, which increases the joint expected payoff for selfish subjects in the MEDIOCRE and DEFUSE treatment and the joint expected payoff of uninformed subjects in the DEFUSE treatment. If the behavior is not changing across the treatments, one would expect a positive effect on the realized payoffs.

Let us compare the overall share of welfare optimal[11] choices. To deal with uninformed choices, which by the probability of half are joint payoff optimal; also, half of the uninformed choices are defined as joint payoff maximal and the other half as not joint payoff maximal. This approach seems cleaner compared to using the resulting real payoffs, which are affected by nature‘s drawing. Figure 6 presents the share of expected joint payoff maximizing behavior.

The difference of 4.7% between the BASELINE and the DEFUSE treatment is not significant (one-sided Fisher's exact p-value=.161). The difference between the BASELINE and the MEDIOCRE treatment is significant (one-sided Fisher's exact p-value=.020). This negative direction of the effect directly follows from more

[11]Here, welfare optimal describes the joint payoff maximizing behavior and is not necessarily related to joint utility, which may depend on various factors.

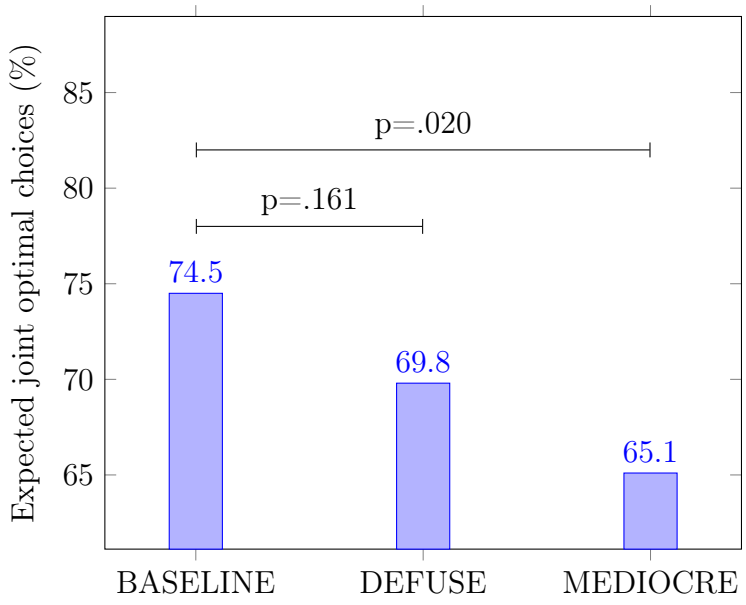

Figure 6: Share of expected joint optimal choices by treatment. P-values are calculated using one-sided Fisher's exact tests

uninformed subjects (Result 4) and less prosocial behavior among the informed subjects with conflicting interests (Result 3).

Result 5. *The share of joint optimal choices is lower compared to the BASELINE. If at all, the share of joint optimal behavior is even reduced in DEFUSE and in the MEDIOCRE treatment.*

A direct side effect of reducing the treatments' dilemma size is adjusting the payoff structure. In particular, the expected payoff of the passive player for uninformed behavior and the payoff of the passive player for selfish behavior differs as shown in Figure 6. Given that in both treatments, the passive player has a higher expected payoff for uninformed and for selfish behavior, one would ceteris paribus, without any behavioral change, already expect an overall positive effect on the passive player's payoff. Figure 7 compares the resulting mean payoffs by group and treatment[12].

We observe that the passive player receives, on average, 43.4 cents in the DEFUSE treatment, 39.8 cents in the BASELINE, and 39 cents in the MEDIOCRE treatment.

[12]In order to exclude a possible random effect due to nature's drawing, I use the expected payoff for uninformed choices and not the real payoff.

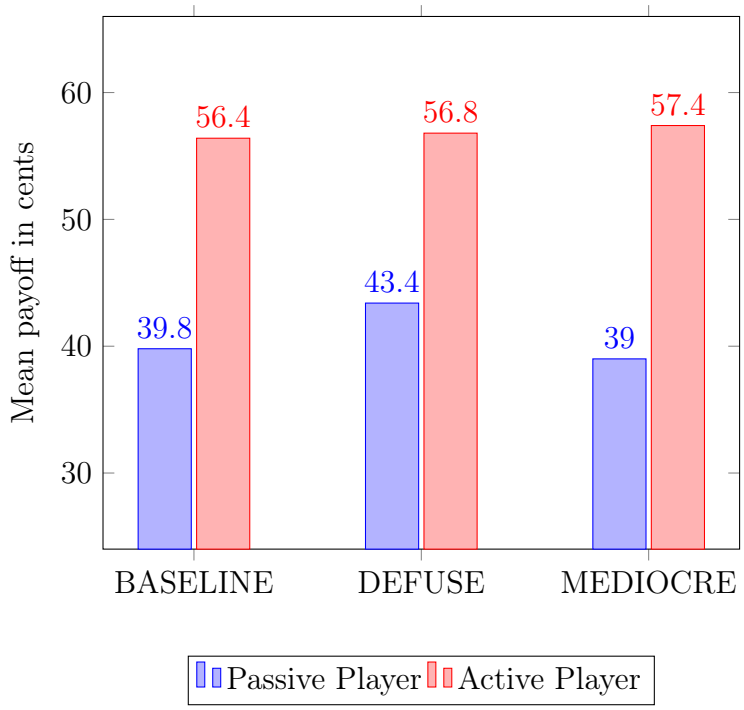

Figure 7: Mean expected payoff by role and treatment in cents

In comparison, the active player, on average, receives 56.8 cents in the DEFUSE, 56.4 cents in the BASELINE, and 57.4 cents in the MEDIOCRE treatment. Looking at the DEFUSE treatment compared to the BASELINE, the increase for the passive player is not surprising and is a direct result of the adjustment of the payoff structure. In the DEFUSE treatment, on average, both the active and the passive player ($p < .001$) receive a higher payoff compared to the BASELINE. One might expect a similar effect in the MEDIOCRE treatment. Interestingly in this experiment, adding an extra mediocre option for the passive player even has a negative effect. In comparison, the active player receives significantly ($p = .02$) more on average. The positive effect of higher expected passive payoffs for uninformed and selfish behavior is dominated by the negative effect of reducing pro-social behavior.

3.5 Analysis of Additional Measures

Using the ex-post questionnaire measure for conflict avoidance (Goldstein, 1999), I test whether this conflict-avoidance score can explain choice and information behavior in the experiment. If dilemma aversion is a relevant motive, one would also

expect a relationship between ignorance behavior and the conflict aversion scale. No economically or statistically significant relationship between the conflict avoidance score neither with the information acquisition behavior, nor the prosocial behavior in the experiment is observed.[13] In the next step, I will descriptively examine whether and to which degree the time spent on the experimental pages differs between the treatments. Subjects in the BASELINE spend 175 seconds on the instruction page. On average, subjects spent 10 seconds less in the DEFUSE treatment and 26 seconds less on the instructions in the MEDIOCRE treatment. Easier or shorter instructions can not explain this. The instructions in the DEFUSE treatment differ just by one number, and the instructions in the MEDIOCRE treatment are even slightly longer. Similarly, subjects in the BASELINE spend, on average, 55 seconds on the information acquisition page. Whereas, subjects in the DEFUSE treatment spend 7 seconds less and subjects in the MEDIOCRE treatment 13 seconds less on the information acquisition page. One explanation could be that the groups are just differently quickly. Comparing the time spent on the other pages, which do not differ between the treatments, this explanation seems to not hold as there is no relevant difference between the treatments.

4 Discussion

The study fails to provide evidence that dilemma aversion drives information avoidance. Given the possible contrary confounding effect with an unknown size, only a significant reduction would have provided clear evidence. Not observing a reduction of information avoidance should not be interpreted as evidence of a non-existing dilemma aversion effect. For the non-observed effect, different explanations exist.

One possible explanation is that dilemma aversion is no relevant factor for information avoidance. Another explanation could be that the study does not observe

[13]For details on the regression, see Table 13 and Table 14 in the appendix. However, one should not over-interpret the missing significant relation. One possible explanation for the missing predictive power of the conflict avoidance measurement might be inattention and following the missing validity of the score. Subjects knew that they had been on the last pages of the experiment and, on average, only spent 60 seconds for all of the 15 items.

an existing effect of dilemma aversion because of the contrary confounding effect. Our data at least indicates that the effect of dilemma aversion is not too big as it is smaller than the confounding effects in the experiment. An alternative explanation is that subjects are dilemma avers, but they only account for the existence and not the size of the dilemma. If this explanation is true, the experimental design could not identify such an effect, as neither the MEDIOCRE nor the BASELINE treatment aims to fully evolve the dilemma situation. Subjects might have costs of entering a dilemma situation independent of the characteristic of the dilemma. This explanation would be better in line with the existing studies of Exley and Kessler (2021) and Jarke-Neuert and Lohse (2022). Looking at the non-clear evidence about the role of dilemma aversion, it might be interesting to further explore whether subjects are averse to entering dilemma situations or are actually sensitive toward the dilemma size. However, manipulating the dilemma size without manipulating the informational value seems to be challenging and might not be possible. A different and more promising approach might be to instead of manipulating the dilemma size to affect the perceived dilemma costs. Future studies could try to uncouple dilemma costs from the informing action. If subjects are aware that they can not really avoid a dilemma situation by remaining uninformed, the protective value of remaining uninformed should be reduced. A possible treatment would be that subjects who do not reveal social information must play the strategy method.

An interesting side finding results from comparing the DEFUSE and the MEDIOCRE treatment. In the informed situation with conflicting interests, the payoffs only differ by the additional dominated option. With the option, the rate of prosocial behavior is remarkably reduced. As the study aims to find evidence for dilemma aversion and this comparison is unintended, I can only speculate about mechanisms explaining the difference.

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5 Appendix

Additional Tables

Table 9: Irrational behavior by attempts for the control questions

	#False attempts for control questions				
	0	1	2	3	4
Irrational choices (%)	38 (.08)	19 (.13)	5 (.15)	1(.33)	1(.50)
Observations	488	148	34	3	2

Note. The more false attempts a subject needed before correctly answering the control questions, the more likely we classify the choice as irrational (Pearsonχ^2 p-value: .033).

Table 10: Irrational choices and time in seconds spend on the experimental parts

Time spend (sec)	Rational	Irrational	Pearson χ^2 p-value
Starting page	78	98	.056
Instruction page	158	203	.053
Information page	55	48	.42
Decision page	61	50	.125
Questionnaire	83	90	.214
Total	380	441	.052

Note. Subjects described as irrational spend more time on reading the instructions, answering the control questions and filling out the questionnaire. In contrast on the pages, there one could just click they made quicker decisions.

Table 11: Time in seconds spend on the experimental parts by treatment.

Time spend (sec)	BASELINE	DEFUSE	MEDIOCRE
Starting page	75	82	83
Instruction page	175	164	149
Information page	55	48	42
Decision pages	15	18	17
Questionnaire	85	84	81
Total	402	390	368

Note. Subjects in the DEFUSE and the MEDIOCRE choices spend less time on the experiment. This effect is driven by the time spend on instructions and control questions and on the information acquisition page.

Table 12: Regressions of the MEDIOCRE and DEFUSE treatment on information acquisition behavior

Information	Model 1		Model 2	
Acquisition	Coef.	P>|t|	Coef.	P>|t|
MEDIOCRE	-.023	.623	−.021	.064
DEFUSE	-.065	.161	−.064	.171
Female			.036	.326
Age			.001	.918
Student			.003	.957
Graduated			.043	.492
Econ. Student			−.082	.527
Constant	.647	.001	.618	.001
				N=675

Note. In Model 1, we report the observed treatment effect. The constant represents the BASELINE level of information acquisition. Model 2 includes demographics. Coefficients remain robust.

Table 13: Regressions of the conflict avoidance score on information acquisition behavior

Information	Model 1		Model 2	
Acquisition	Coef.	P>|t|	Coef.	P>|t|
Conflict Aversion	.002	.171	.002	.240
Female			.026	.483
Age			.001	.959
Student			.013	.824
Graduated			.040	.522
Econ. Student			−.083	.523
Constant	.561	.001	.54	.001
				N=675

Note. Model 1 reports the observed effect of individual conflict avoidance (Goldstein, 1999) on information acquisition behavior. Model 2 includes demographics. Coefficients remain robust. The measurement is not much predictive power.

Table 14: Regressions of the conflict aversion score on prosocial behavior

Prosocial	Model 1		Model 2	
Behavior	Coef.	P>|t|	Coef.	P>|t|
Conflict Aversion	-.004	.171	−.004	.191
Female			−.047	.352
Age			.001	.851
Student			−.046	.569
Graduated			−.102	.220
Econ. Student			−.058	.738
Constant	.346	.001	.375	.001
				N=675

Note. Model 1 reports the observed effect of individual conflict avoidance (Goldstein, 1999) on pro-social behavior. Model 2 includes demographics. Coefficients remain robust. The measurement is not much predictive power.

Conceptual Framework

The model describes a two-player game, following the notation from Grossman and Van Der Weele (2017). Since the argument does not require image or self-image effects, we simplify their model by taking out any image concerns. The two players are the active and the passive player, where the passive player is only important as the active player may depending on her preferences, also consider the outcome of the passive player.

In the game, the active player can engage in a potentially prosocial action $a \in \{0, 1\}$, where $a = 1$ results at costs c. This action may generate some form of social welfare $W = w$ or not $W = -w$. Whether the action generates or reduces social welfare depends on the state of the world, which the agent can learn in form of a signal $\sigma \in \{\sigma_w, \sigma_0, \emptyset\}$. σ_w presents a 'conflicting' signal ($W = w$), σ_0 presents an 'aligned' signal ($W = -w$) and $\emptyset$ denotes that the agent has not informed herself Before having to decide which action to take, the agent can either inform herself ($I = 1$) about the signal σ and the impact of the action on welfare or remain uninformed ($I = 0$). In the framework and the experimental design informing is free of direct costs. But to solve indifference, let us assume that the action to inform oneself comes at small costs k ($0 < k < \epsilon$). Before informing the agent knows the prior probability $p = 0.5$ of receiving the signal σ_w and being in the 'conflicting' state ($W = w$).

The own payoff considerations are described by the costs c resulting from action $a = 1$. The agent cares for her effect on the other's payoff depending on her social preferences $\beta_i \in [0, 1]$. The higher β_i the more rewarding it is for her that she is causally responsible for the other's payoff created. Let us denote the effect on the passive player of choosing action $a = 1$ given the state of the world $W \in \{w, -w\}$ as $\Phi = W|\sigma$. It follows that knowing the state of the world, Φ equals w in the conflicting state ($W = w$) and $-w$ in the aligned state ($W = -w$).

Remember that to know the state of the world, the agents need to learn the signal σ by revealing the informing (I=1). I describe the expected effect of choosing action $a = 1$ as $E[\Phi] = E[W|\sigma]$.

To account for dilemma aversion, I extend the model by an additional term. The additional term consists of individual parameter $\delta_i \in \{0, 1\}$ for how dilemma averse the agent is, and D denoting the dilemma size. A high δ_i reflects a strong dilemma aversion.

We calculate the dilemma size D by using a payoff comparison between the welfare and the individual optimal actions. If a choice is individually and socially optimal, no dilemma is existing and thus, no dilemma size can be calculated. Similarly, if there is only one choice and no freedom of not making a choice, there is also no dilemma. I assign a situation without a dilemma with a dilemma size of zero[14]. The individual costs are described by c. The resulting dilemma size is described by the following term under certainty.

$$D = (\frac{c}{\Phi})$$

To denote uncertainty of the actual state of the world and the resulting dilemma

$$E[D] = (\frac{c}{E[\Phi]})$$

For $\Phi \geq c$, D is $\in [0, 1]$. There $D \to 1$ indicates a large dilemma and $D \to 0$ a smaller dilemma size. Importantly being not informed allows the agent to avoid the dilemma as a dominant option exists as $E[\Phi|I = 0] = 0$. In the existence of a dilemma, dilemma costs are increasing with the individual costs of acting prosocial and decreasing with the welfare effect. In the game, the probability of being in a dilemma after informing is described by p. This results in the following expected utility function for an uninformed agent:

$$u(a, I, W) = \beta_i E[\Phi]a - ac - Ik - p\delta_i E[D] \tag{1}$$

[14]Note that the measure is sufficiently working within the game. As in non of the sub-games, more than two non-dominated options exist. If the choice set of non-dominated options would be bigger, the measure is by design not able to account for all options. A more general measurement could be a normalized and somehow weighted sum of all sub-dilemmas.

After informing, uncertainty disappears and the utility function can directly be described by the known effect of choosing action $a = 1$. Similarly, the costs of informing k and of being in a dilemma are already realized, and hence disappear from the utility function:

$$v(a, W) = \beta_i * \Phi * a - a * c \tag{2}$$

Analysis

Let us describe the strategy of agent i by the four sub-game strategies $s_1 \in \{I\}$, $s_2 \in \{a|\sigma_0\}$, $s_3 \in \{a|\sigma_w\}$ and $s_4 \in \{a|\emptyset\}$. I will explore resulting rational strategies and how they depend on individual preference types. Going backward, I will first explore the sub-game strategies in the second stage and lastly the decision to inform or not.

Lemma 1. *An uninformed agent will never choose action $a = 1$ and thus, $s_4\{a = 0\}$ is the dominant sub-game strategy.*

Proof. The lemma holds if the expected utility for an agent, who will not inform herself and chooses the pro-social action is lower than not choosing the pro-social action. Because of the symmetrical payoff structure of the passive player, and $p = 0.5$, the expected payoff of choosing action $a = 1$ or $a = 0$, is the same:

$$E(\Phi|\sigma = \emptyset) = 0.5w - (1 - 0.5)w = 0$$

It follows that the individual and the socially optimal option are not conflicting and no dilemma exists $E[D] = 0$. An uninformed agent can not benefit from choosing $a = 1$. Because of $c > 0$, an uninformed agent in this game should never choose the prosocial action $a = 1$.

Setting in the parameters into the expected utility function and comparing the expected utility depending on a, one can clearly see that in the uninformed case

(I=0) the right-hand side is always bigger:

$$u(a = 1, \beta_i, E[\Phi|I = 0]) = -c < 0 = u(a = 0, \beta_i, E[\Phi|I = 0])$$

□

Lemma 2. *For an informed agent in the aligned situation,* $s_2\{a = 0\}$ *is the dominant sub-game strategy.*

Proof. I want to show that an informed agent, who knows σ_0 and that the state of the world is $W = -w$ has a higher utility when choosing $a = 0$. Because of the structure of the game, we already know that

$$\Phi(W|\sigma = \sigma_0) = -w < 0$$

and that the agent can not create but only reduce welfare by choosing $a = 1$.

Setting the parameters and simplifying the utility function the following relation results:

$$v(a = 1|W = -w) = \beta_i * (-w) * a - c < 0 = v(a = 0|W = 0) \tag{3}$$

Because $-w < 0$ and $c > 0$, overall the left side is also negative and thus smaller than zero and smaller than the right side representing the utility when choosing $a = 0$. □

Let us focus on the situation in which the state of the world (σ_w) is revealed. Here no clearly dominant strategy exists. Note that as the sub-game starts after informing the direct and indirect costs of informing such as k or potential dilemma costs are sunk costs and do not affect the strategy.

Lemma 3. *Agents will depend on their social preference parameter* β_i *either choose* $a = 1$ *or* $a = 0$. *Selfish agents* $\beta_i < \beta^*$ *will play* $s_3\{a = 0\}$ *and prosocial agents with* $\beta_i > \beta^*$ *will play* $s_3\{a = 1\}$.

Proof. Knowing that $W = w$, the agent gains from $a = 1$ if and only if

$$\beta_i w > c \iff \beta_i > \frac{c}{w}.$$

Let us describe agents with an $\beta_i > \beta^*$ such that $\beta_i > \frac{c}{w}$ as prosocial and agents with an $\beta_i < \beta^*$ such that $\beta_i < \frac{c}{w}$ as selfish agents. An agent with $\beta_i = \beta^*$ would be indifferent. □

Being aware of the dependent strategies s_2, s_3, and s_4, I can now focus on the decision to inform oneself. Let us first look at agents who are not dilemma avers $\delta_i = 0$. In the absence of dilemma costs and having marginal costs of informing k, selfish agents would never inform and prosocial agents would always inform themselves. If the costs of informing k are not marginal, some prosocial agents will stop informing.

Proposition 1. *Non dilemma-averse agents with $\beta_i \leq \beta^I$ will never inform $s_1\{I = 0\}$, and agents with $\beta_i > \beta^I$ will always inform $s_1\{I = 1\}$.*

Proof. Agents will inform themselves if the expected benefit of choosing $a = 1$ is bigger than the expected costs of the prosocial action c and the costs of informing k.

$$p\beta_i w > pc + k \iff p(\beta_i w - c) > k$$

If the expected benefit of acting pro-social $p(\beta_i w - c)$ is bigger than k, agents will decide to inform themselves. This gives us our new threshold:

$$\beta^I = \frac{pc + k}{pw}$$

It follows that agents with $\beta_i < \beta^I$ will never inform $s_1\{I = 0\}$, and agents with $\beta_i > \beta^I$ will always inform $s_1\{I = 1\}$. Because $\beta^I \geq \beta^*$ a selfish agent i with $\beta_i < \beta^*$ will never inform. But also a prosocial agent i with $\beta^* < \beta_i < \beta^I$ will remain uninformed. An agent with $\beta_i = \beta^I$ is indifferent. □

Let us now consider the behavior of dilemma-averse agents with $\delta_i > 0$. The problem changes to whether the potential costs of informing, entering the dilemma

situation, and acting prosocial are bigger or smaller than the benefit of acting prosocial. An agent would inform herself if

$$\beta_i E[\Phi]a > ac + \delta_i E[D] + Ik \tag{4}$$

Let us remind that in the absence of dilemma costs prosocial agents with $\beta_i \geq \beta^I$ would choose $I = 1$ and $a = 1|\sigma_w$ and agents with $\beta_i < \beta^I$ would choose $I = 0$ and $a = 0$. Accounting for the additional dilemma costs in the game shifts the threshold depending on the degree of dilemma aversion δ_i, the dilemma size D, and the probability of being in a dilemma p.

For any dilemma avers agent i there exists a threshold β^D such that agents with $\beta_i < \beta^D$ would remain uninformed and choose $a = 0$ and agents with a $\beta_i \geq \beta^D$ would inform themselves and choose $a = 1|\omega_w$.

Proposition 2. *There exists an agent i, with β_i, where $\beta^D > \beta_i > \beta^I$, who when not accounting for dilemma aversion would play the strategy $s_1\{I = 1\}$ and when accounting for dilemma costs play strategy $s_1\{I = 0\}$. I describe this agent as a dilemma-motivated non-informer.*

Proof. Agents will inform themselves if the expected benefit of choosing $a = 1$ is bigger than the expected costs of the prosocial action c, the direct costs of informing k, and the increased expected dilemma costs after informing.

$$p\beta_i w > p(c + \delta_i E[D]) + k \iff \beta_i > \frac{p(c + \delta_i E[D]) + k}{pw}$$

Let us compare the threshold β_i with (left) and without accounting (right) for dilemma aversion for which an agent would inform herself.

$$\frac{p(c + \delta_i E[D]) + k}{pw} \geq \frac{pc + k}{pw}$$

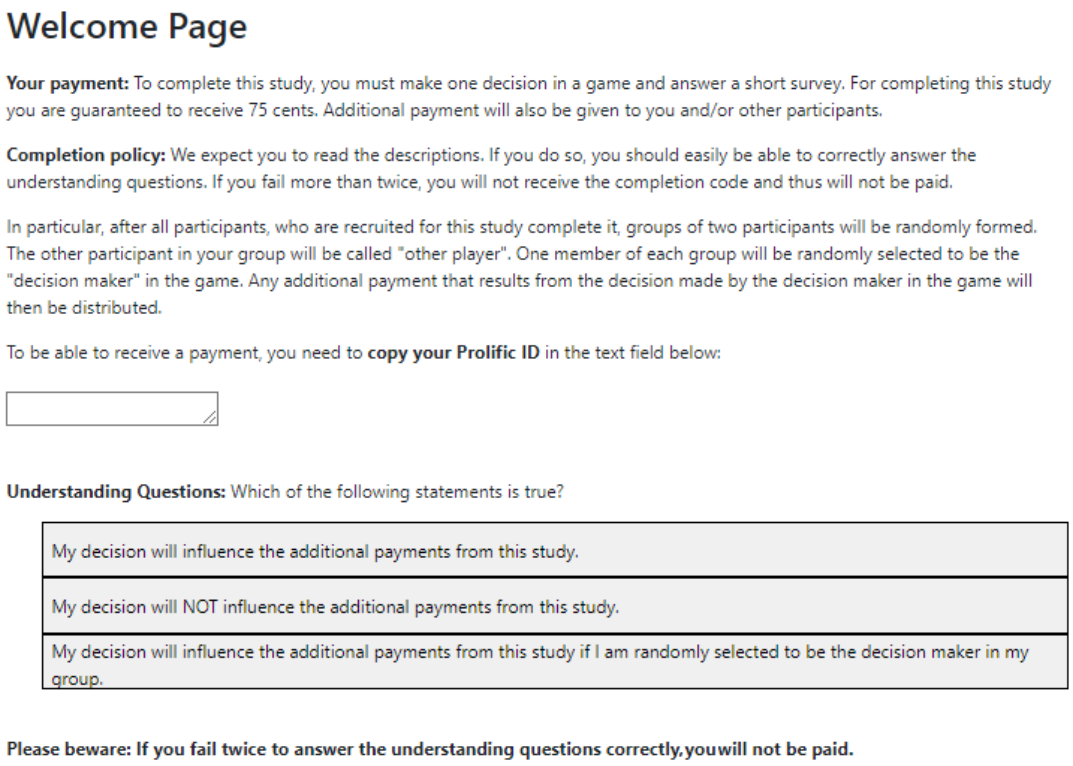
Because $\delta_i E[D] \geq 0$ the left side is at least as big as the right side. It directly follows

that if accounting for dilemma aversion the threshold increases:

$$\beta_i^D \geq \beta^I$$

□

Experimental Screens



Welcome Page

Your payment: To complete this study, you must make one decision in a game and answer a short survey. For completing this study you are guaranteed to receive 75 cents. Additional payment will also be given to you and/or other participants.

Completion policy: We expect you to read the descriptions. If you do so, you should easily be able to correctly answer the understanding questions. If you fail more than twice, you will not receive the completion code and thus will not be paid.

In particular, after all participants, who are recruited for this study complete it, groups of two participants will be randomly formed. The other participant in your group will be called "other player". One member of each group will be randomly selected to be the "decision maker" in the game. Any additional payment that results from the decision made by the decision maker in the game will then be distributed.

To be able to receive a payment, you need to **copy your Prolific ID** in the text field below:

Understanding Questions: Which of the following statements is true?

- My decision will influence the additional payments from this study.
- My decision will NOT influence the additional payments from this study.
- My decision will influence the additional payments from this study if I am randomly selected to be the decision maker in my group.

Please beware: If you fail twice to answer the understanding questions correctly,youwill not be paid.

Figure 8: Screenshot of first page of the experiment for all treatments

Instructions

As an active player, you have two options: A and B. Your choice has consequences on your payoff and that of the passive player.

You will receive **60 cents** if you choose **A** and **50 cents** if you choose **B**.

The passive player`s payoff depends on the situation. The passive player receives...

- **10 cents** if you choose A and **50 cents** if you choose B **in Situation 1.**
- **50 cents** if you choose A and **10 cents** if you choose B **in Situation 2.**

Put differently, according to whether you are in Situation 1 or Situation 2 and whether you choose A or B, the payoffs for you and the other player can be described as follows:

	Situation 1	
	Active Player Receives	Passive Player Receives
A	60 cents	10 cents
B	50 cents	50 cents

	Situation 2	
	Active Player Receives	Passive Player Receives
A	60 cents	50 cents
B	50 cents	10 cents

Situations 1 and 2 are equally likely to occur. If you want to know in which situation you are, you can click on **First reveal the situation** before making a decision. You can also decide to **directly make a choice**.

Understanding Question: As a decision maker, you will receive more money if. . .

- ... you choose A irrespective of the situation.
- ... you choose B irrespective of the situation.
- ... you choose A in Situation 1 and B in Situation 2.
- ... you choose B in Situation 1 and A in Situation 2.

Understanding Question: The passive player will receive more money if. . .

- ... you choose A irrespective of the situation.
- ... you choose B irrespective of the situation.
- ... you choose A in Situation 1 and B in Situation 2.
- ... you choose B in Situation 1 and A in Situation 2.

Please beware: If you fail twice to answer the understanding questions correctly, you will not be paid.

Next

Figure 9: Screenshot of instructions for the BASELINE treatment

Instructions

As an active player, you have two options: A and B. Your choice has consequences on your payoff and that of the passive player.

You will receive **60 cents** if you choose **A** and **50 cents** if you choose **B**.

The passive player`s payoff depends on the situation. The passive player receives...

- **30 cents** if you choose A and **50 cents** if you choose B **in Situation 1.**
- **50 cents** if you choose A and **30 cents** if you choose B **in Situation 2.**

Put differently, according to whether you are in Situation 1 or Situation 2 and whether you choose A or B, the payoffs for you and the other player can be described as follows:

	Situation 1	
	Active Player Receives	Passive Player Receives
A	60 cents	30 cents
B	50 cents	50 cents

	Situation 2	
	Active Player Receives	Passive Player Receives
A	60 cents	50 cents
B	50 cents	30 cents

Situations 1 and 2 are equally likely to occur. If you want to know in which situation you are, you can click on **First reveal the situation** before making a decision. You can also decide to **directly make a choice**.

Understanding Question: As a decision maker, you will receive more money if. . .

- ... you choose A irrespective of the situation.
- ... you choose B irrespective of the situation.
- ... you choose A in Situation 1 and B in Situation 2.
- ... you choose B in Situation 1 and A in Situation 2.

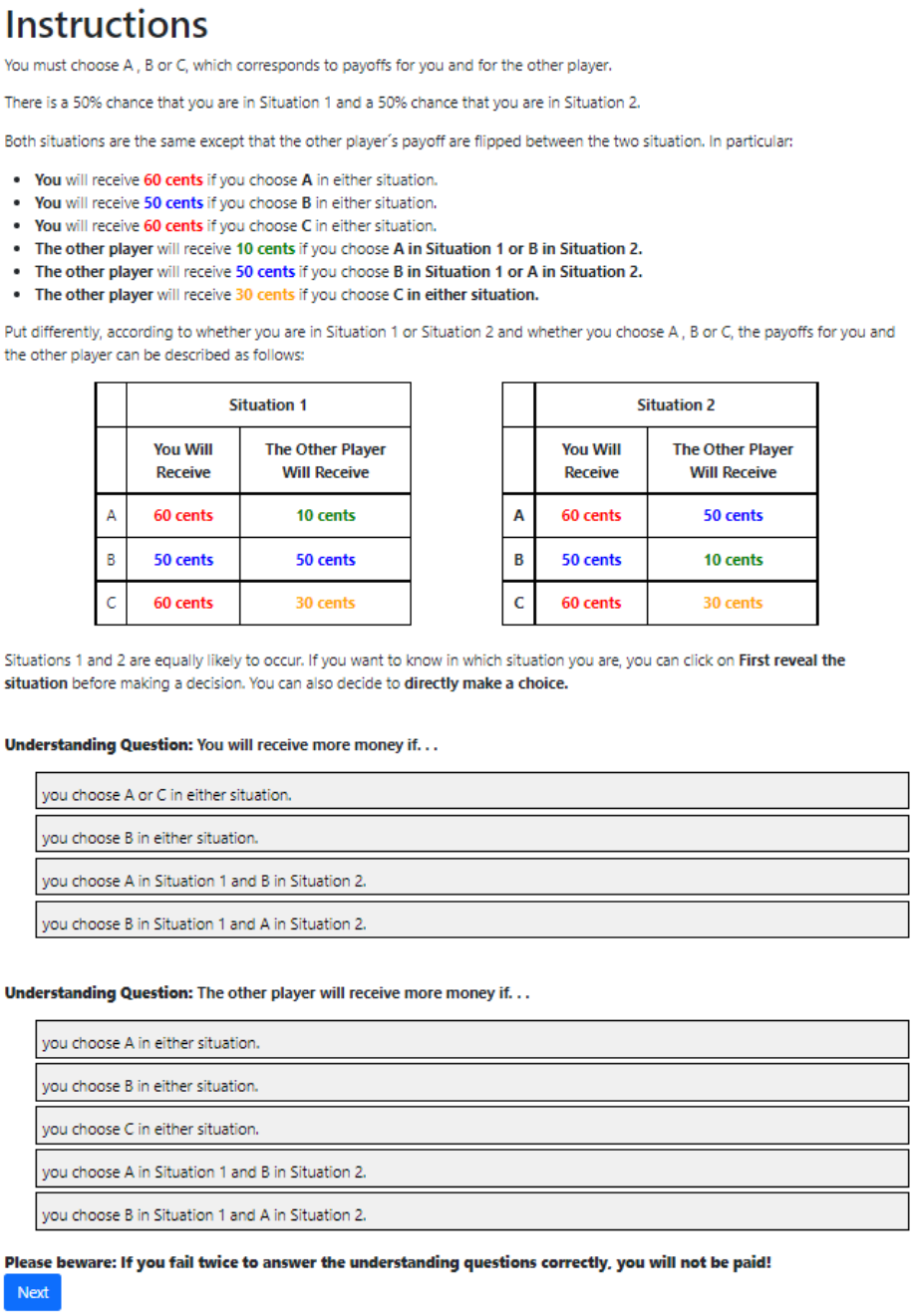
Understanding Question: The passive player will receive more money if. . .

- ... you choose A irrespective of the situation.
- ... you choose B irrespective of the situation.
- ... you choose A in Situation 1 and B in Situation 2.
- ... you choose B in Situation 1 and A in Situation 2.

Please beware: If you fail twice to answer the understanding questions correctly, you will not be paid.

Next

Figure 10: Screenshot of instructions for the DEFUSE treatment



Instructions

You must choose A , B or C, which corresponds to payoffs for you and for the other player.

There is a 50% chance that you are in Situation 1 and a 50% chance that you are in Situation 2.

Both situations are the same except that the other player's payoff are flipped between the two situation. In particular:

- **You** will receive **60 cents** if you choose **A** in either situation.
- **You** will receive **50 cents** if you choose **B** in either situation.
- **You** will receive **60 cents** if you choose **C** in either situation.
- **The other player** will receive **10 cents** if you choose **A in Situation 1 or B in Situation 2.**
- **The other player** will receive **50 cents** if you choose **B in Situation 1 or A in Situation 2.**
- **The other player** will receive **30 cents** if you choose **C in either situation.**

Put differently, according to whether you are in Situation 1 or Situation 2 and whether you choose A , B or C, the payoffs for you and the other player can be described as follows:

	Situation 1	
	You Will Receive	The Other Player Will Receive
A	60 cents	10 cents
B	50 cents	50 cents
C	60 cents	30 cents

	Situation 2	
	You Will Receive	The Other Player Will Receive
A	60 cents	50 cents
B	50 cents	10 cents
C	60 cents	30 cents

Situations 1 and 2 are equally likely to occur. If you want to know in which situation you are, you can click on **First reveal the situation** before making a decision. You can also decide to **directly make a choice.**

Understanding Question: **You will receive more money if. . .**

- you choose A or C in either situation.
- you choose B in either situation.
- you choose A in Situation 1 and B in Situation 2.
- you choose B in Situation 1 and A in Situation 2.

Understanding Question: **The other player will receive more money if. . .**

- you choose A in either situation.
- you choose B in either situation.
- you choose C in either situation.
- you choose A in Situation 1 and B in Situation 2.
- you choose B in Situation 1 and A in Situation 2.

Please beware: If you fail twice to answer the understanding questions correctly, you will not be paid!

Next

Figure 11: Screenshot of instructions for the MEDIOCRE treatment

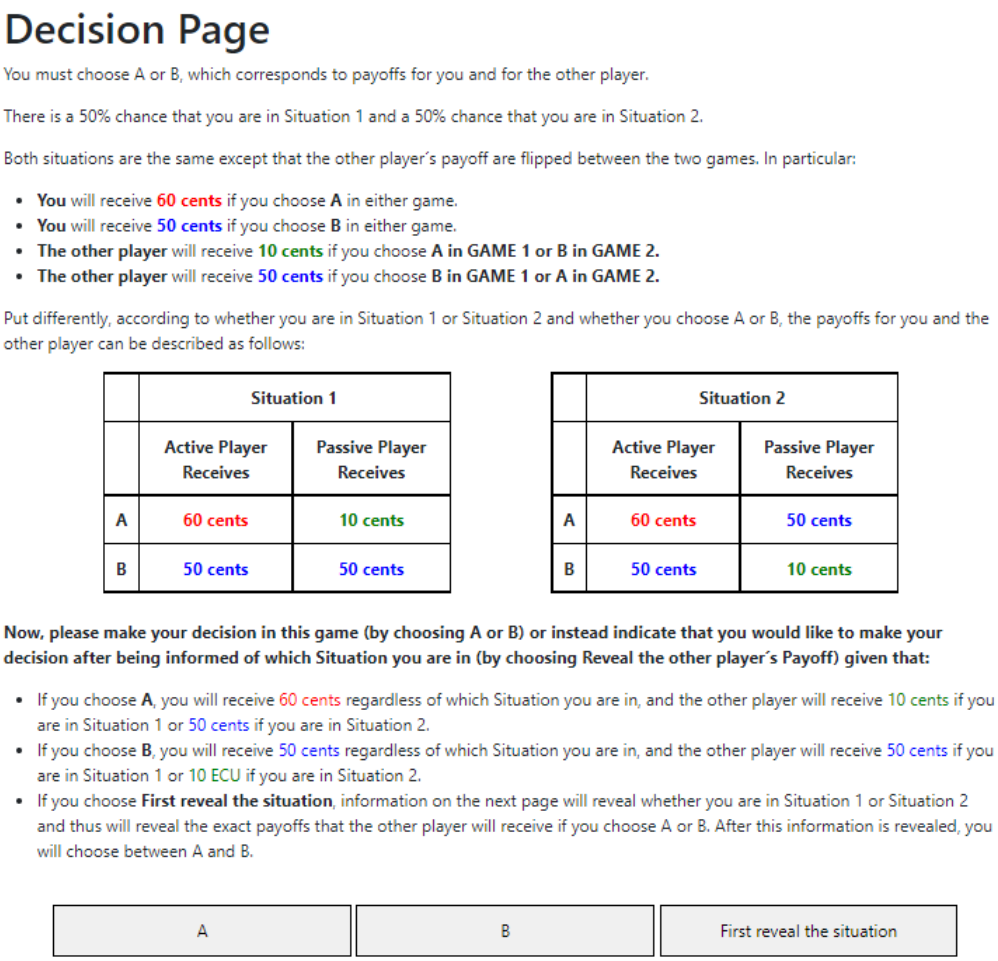


Figure 12: Screenshot of the decision page for the BASELINE treatment before making a decision

Decision Page

You must choose A or B, which corresponds to payoffs for you and for the other player.

There is a 50% chance that you are in Situation 1 and a 50% chance that you are in Situation 2.

Both situations are the same except that the other player's payoff are flipped between the two games. In particular:

- **You** will receive **60 cents** if you choose **A** in either game.
- **You** will receive **50 cents** if you choose **B** in either game.
- **The other player** will receive **30 cents** if you choose **A in GAME 1 or B in GAME 2.**
- **The other player** will receive **50 cents** if you choose **B in GAME 1 or A in GAME 2.**

Put differently, according to whether you are in Situation 1 or Situation 2 and whether you choose A or B, the payoffs for you and the other player can be described as follows:

	Situation 1	
	Active Player Receives	Passive Player Receives
A	60 cents	30 cents
B	50 cents	50 cents

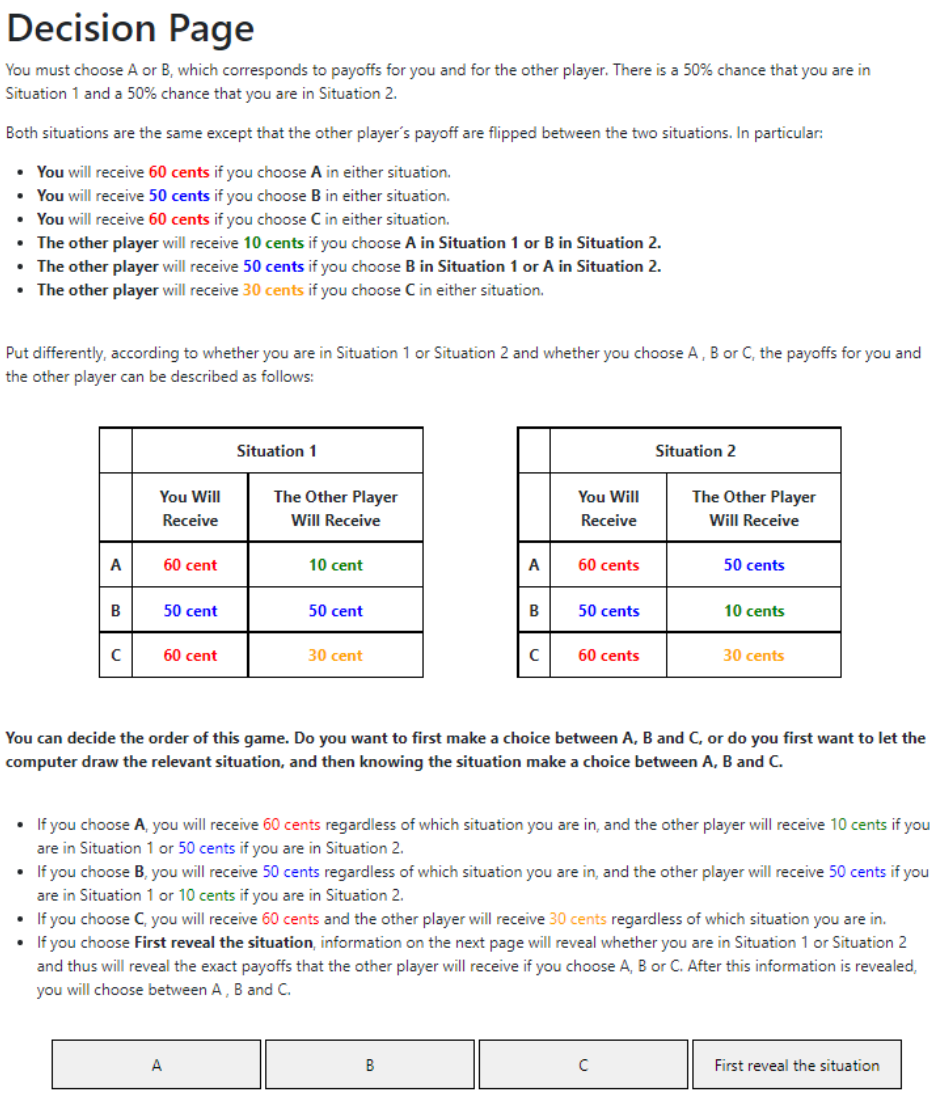
	Situation 2	
	Active Player Receives	Passive Player Receives
A	60 cents	50 cents
B	50 cents	30 cents

Now, please make your decision in this game (by choosing A or B) or instead indicate that you would like to make your decision after being informed of which Situation you are in (by choosing Reveal the other player's Payoff) given that:

- If you choose **A**, you will receive 60 cents regardless of which Situation you are in, and the other player will receive 30 cents if you are in Situation 1 or 50 cents if you are in Situation 2.
- If you choose **B**, you will receive 50 cents regardless of which Situation you are in, and the other player will receive 50 cents if you are in Situation 1 or 30 ECU if you are in Situation 2.
- If you choose **First reveal the situation**, information on the next page will reveal whether you are in Situation 1 or Situation 2 and thus will reveal the exact payoffs that the other player will receive if you choose A or B. After this information is revealed, you will choose between A and B.

A | B | First reveal the situation

Figure 13: Screenshot of the decision page for the DEFUSE treatment before making a decision



Decision Page

You must choose A or B, which corresponds to payoffs for you and for the other player. There is a 50% chance that you are in Situation 1 and a 50% chance that you are in Situation 2.

Both situations are the same except that the other player's payoff are flipped between the two situations. In particular:

- **You** will receive **60 cents** if you choose **A** in either situation.
- **You** will receive **50 cents** if you choose **B** in either situation.
- **You** will receive **60 cents** if you choose **C** in either situation.
- **The other player** will receive **10 cents** if you choose **A in Situation 1 or B in Situation 2.**
- **The other player** will receive **50 cents** if you choose **B in Situation 1 or A in Situation 2.**
- **The other player** will receive **30 cents** if you choose **C** in either situation.

Put differently, according to whether you are in Situation 1 or Situation 2 and whether you choose A , B or C, the payoffs for you and the other player can be described as follows:

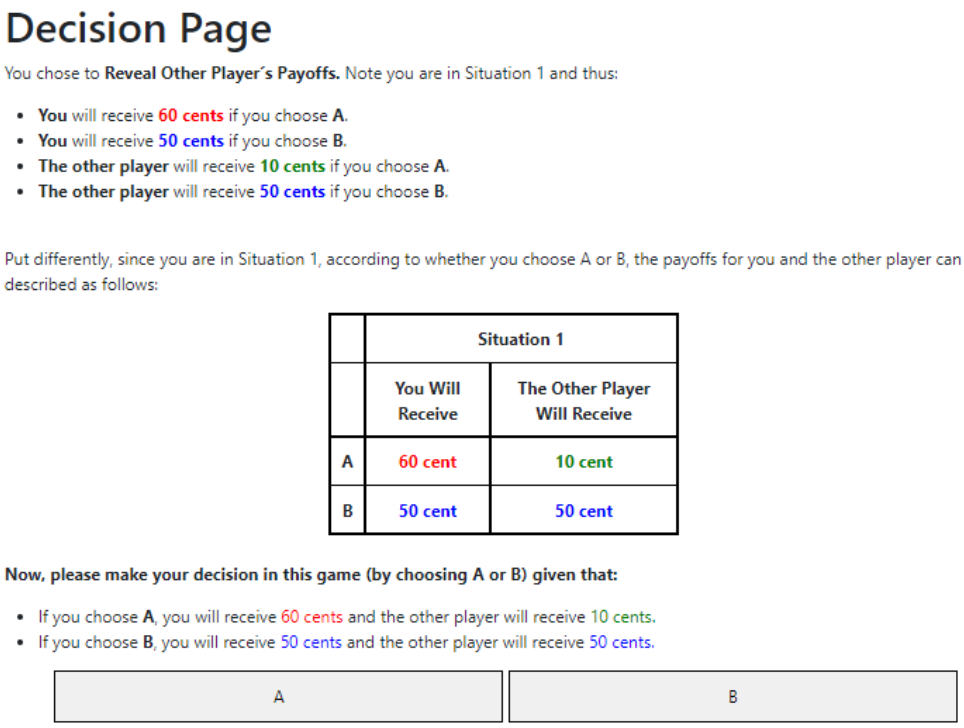
	Situation 1	
	You Will Receive	The Other Player Will Receive
A	60 cent	10 cent
B	50 cent	50 cent
C	60 cent	30 cent

	Situation 2	
	You Will Receive	The Other Player Will Receive
A	60 cents	50 cents
B	50 cents	10 cents
C	60 cents	30 cents

You can decide the order of this game. Do you want to first make a choice between A, B and C, or do you first want to let the computer draw the relevant situation, and then knowing the situation make a choice between A, B and C.

- If you choose **A**, you will receive 60 cents regardless of which situation you are in, and the other player will receive 10 cents if you are in Situation 1 or 50 cents if you are in Situation 2.
- If you choose **B**, you will receive 50 cents regardless of which situation you are in, and the other player will receive 50 cents if you are in Situation 1 or 10 cents if you are in Situation 2.
- If you choose **C**, you will receive 60 cents and the other player will receive 30 cents regardless of which situation you are in.
- If you choose **First reveal the situation**, information on the next page will reveal whether you are in Situation 1 or Situation 2 and thus will reveal the exact payoffs that the other player will receive if you choose A, B or C. After this information is revealed, you will choose between A , B and C.

Figure 14: Screenshot of the decision page for the MEDIOCRE treatment before making a decision



Decision Page

You chose to **Reveal Other Player´s Payoffs.** Note you are in Situation 1 and thus:

- **You** will receive **60 cents** if you choose **A**.
- **You** will receive **50 cents** if you choose **B**.
- **The other player** will receive **10 cents** if you choose **A**.
- **The other player** will receive **50 cents** if you choose **B**.

Put differently, since you are in Situation 1, according to whether you choose A or B, the payoffs for you and the other player can be described as follows:

	Situation 1	
	You Will Receive	The Other Player Will Receive
A	60 cent	10 cent
B	50 cent	50 cent

Now, please make your decision in this game (by choosing A or B) given that:

- If you choose **A**, you will receive 60 cents and the other player will receive 10 cents.
- If you choose **B**, you will receive 50 cents and the other player will receive 50 cents.

A B

Figure 15: Screenshot of the decision page for the BASELINE treatment after revealing the conflicting interests situation

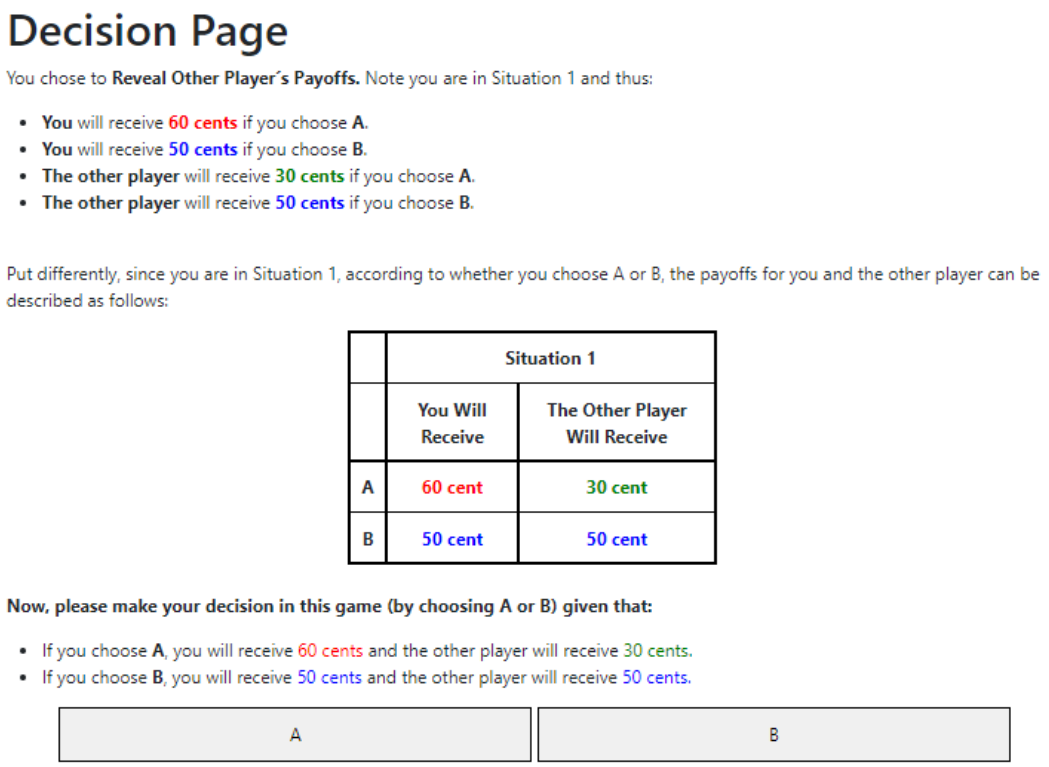
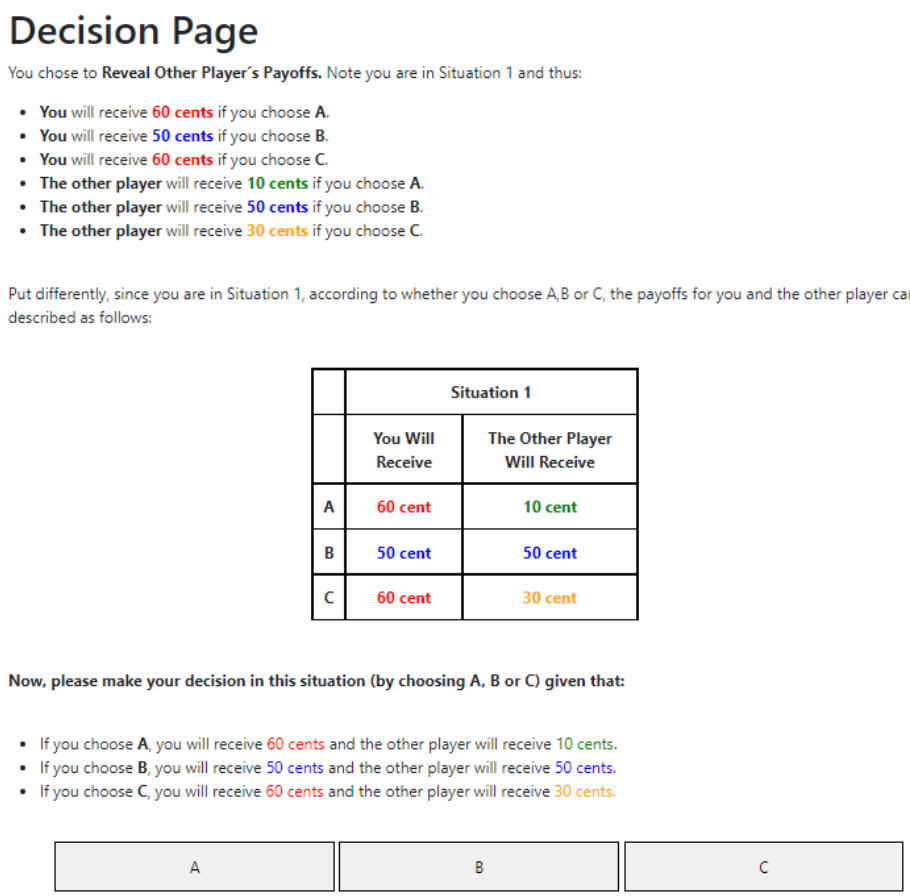


Figure 16: Screenshot of the decision page for the DEFUSE treatment after revealing the conflicting interests situation



Decision Page

You chose to **Reveal Other Player´s Payoffs.** Note you are in Situation 1 and thus:

- **You** will receive **60 cents** if you choose **A**.
- **You** will receive **50 cents** if you choose **B**.
- **You** will receive **60 cents** if you choose **C**.
- **The other player** will receive **10 cents** if you choose **A**.
- **The other player** will receive **50 cents** if you choose **B**.
- **The other player** will receive **30 cents** if you choose **C**.

Put differently, since you are in Situation 1, according to whether you choose A,B or C, the payoffs for you and the other player can be described as follows:

	Situation 1	
	You Will Receive	The Other Player Will Receive
A	60 cent	10 cent
B	50 cent	50 cent
C	60 cent	30 cent

Now, please make your decision in this situation (by choosing A, B or C) given that:

- If you choose **A**, you will receive 60 cents and the other player will receive 10 cents.
- If you choose **B**, you will receive 50 cents and the other player will receive 50 cents.
- If you choose **C**, you will receive 60 cents and the other player will receive 30 cents.

A B C

Figure 17: Screenshot of the decision page for the MEDIOCRE treatment after revealing the conflicting interests situation

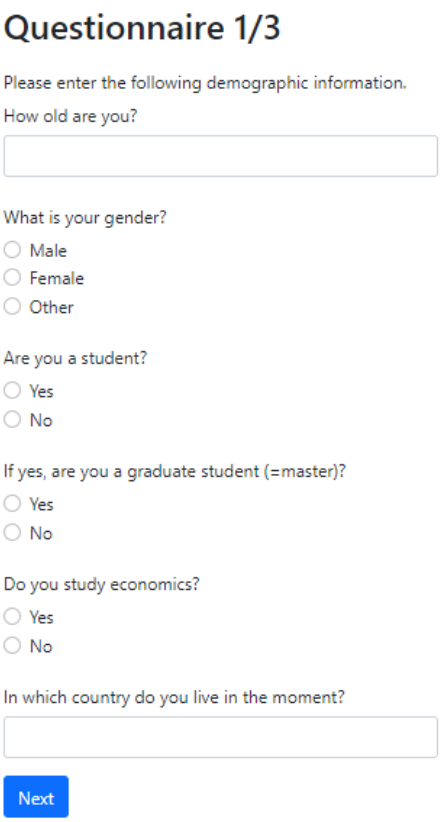


Figure 18: Screenshot of demographic questionnaire for all treatments

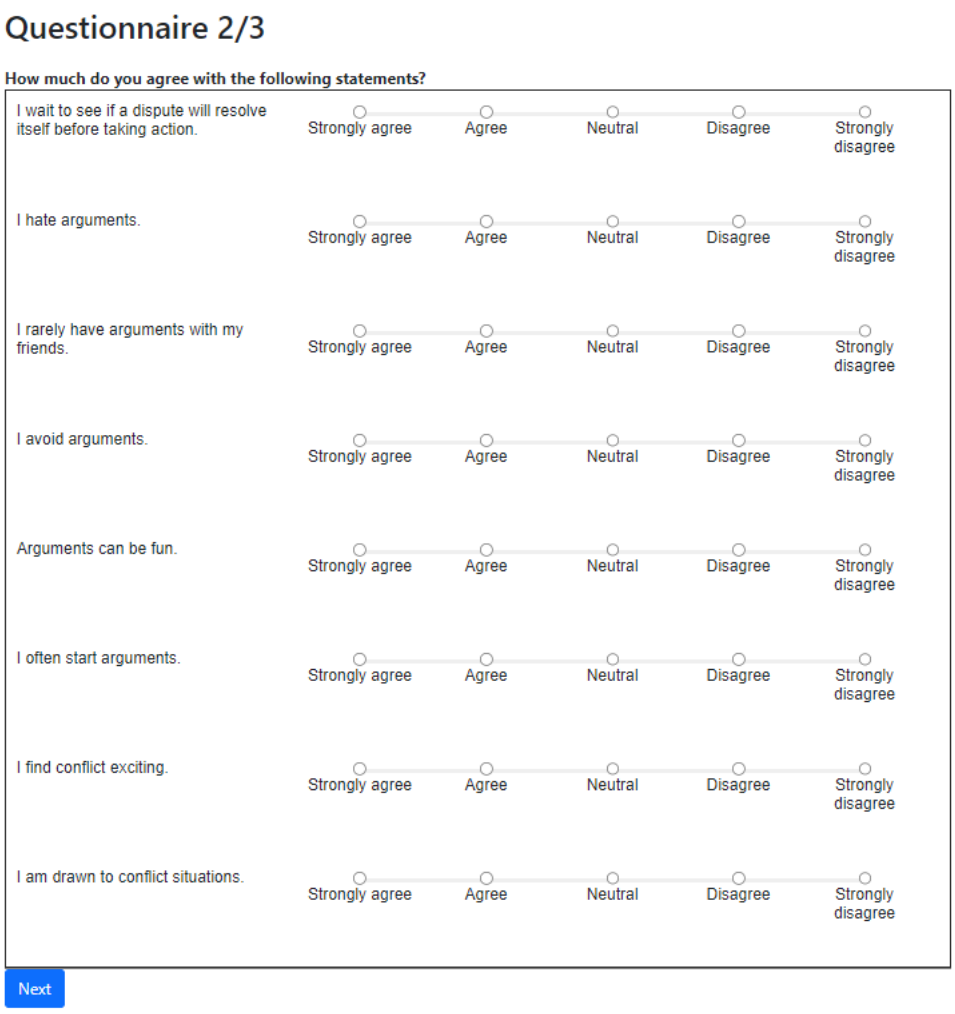


Figure 19: Screenshot of conflict avoidance scale items 1-8 for all treatments

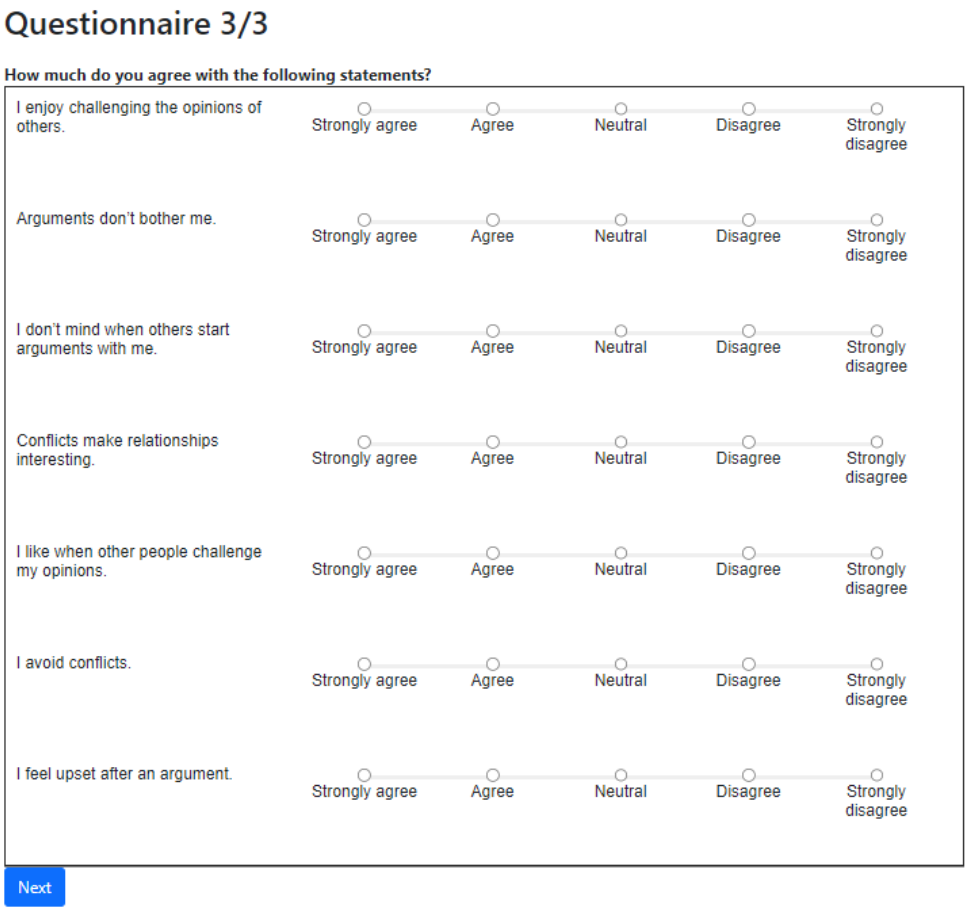


Figure 20: Screenshot of conflict avoidance scale items 9-15 for all treatments