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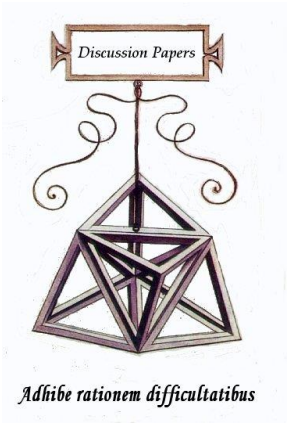

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Delaying and Motivating Decisions in the (Bully) Dictator Game

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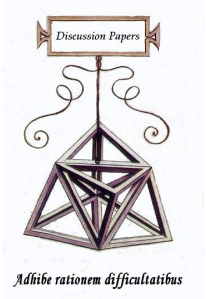


Ennio Bilancini, Leonardo Boncinelli, Pietro Guarnieri, Lorenzo Spadoni

Delaying and Motivating Decisions in the (Bully) Dictator Game

Abstract

We investigate experimentally how decisions in the Dictator Game are affected by cognitive manipulations aimed at promoting greater reliance on deliberation. Specifically, we run an online experiment where we have 6 distinct experimental conditions resulting from the combination of 2 conditions for the Dictator Game (*non-bully*: the dictator is initially endowed with all the money; *bully*: the initial endowment is equally split), and 3 conditions for the cognitive manipulations (*time delay*: decisions are delayed; *motivated delay*: decisions are delayed and a written motivation is required; *control*: no manipulation). We find that the equal initial endowment leads the dictator to keep less for himself, confirming in the online setting previous evidence from the lab. Further, our findings suggest that the request to write a motivation makes subjects take less for themselves with respect to the mere request to wait some time before choosing.

Keywords: dual process; motivation; deliberation; intuition; Dictator Game; bully; social norms.

JEL: D01; D81.

1 Introduction

Manipulation of cognition has been widely applied to explore how different modes of cognition affect altruistic and prosocial behavior (Capraro, 2019; Rand, 2019; Kvarven et al., 2020). The literature has mostly focused on the distinction between intuition and deliberation (Kahneman and Egan, 2011), rooted in the dual process theory of cognition (Evans and Stanovich, 2013). An array of experimental conditions has been designed to induce greater reliance on intuition or deliberation. Some conditions use time-related manipulations, others rely on priming or involve tasks that require cognitive effort. However, it is unclear to what extent the impact on behavior is sensible to the specific features of these conditions, i.e., the specific mechanism through which they affect prosocial behavior (Chen and Krajbich, 2018; Crosetto and Güth, 2020). Regarding the conditions aimed at promoting reliance on intuition, although there is no systematic comparative study on their effects, some evidence has been accumulated which suggests that relying on time pressure (Merkel and Lohse, 2019; Alós-Ferrer and Garagnani, 2020; Teoh et al., 2020), cognitive load Deck and Jahedi (2015); Schulz et al. (2014); Achtziger et al. (2020), or ego depletion (Baumeister et al., 1998; Baumeister, 2019; Alós-Ferrer et al., 2019) may not be neutral (Tinghög et al., 2016; Capraro and Cococcioni, 2016; Grossmann et al., 2017; Evans and Rand, 2019). In contrast, no substantial evidence has been produced regarding the conditions aimed at promoting reliance on deliberation.

It is widely believed that requiring decision-makers to wait before actually making a decision induces, on average, greater reliance on deliberation (Horstmann et al., 2009). More recently a new method, where experimental subjects are required to motivate their decision with a written text, has been applied with the aim of inducing greater reliance on deliberation (Bilancini et al., 2019, 2020, 2021). This new method yields a delay in decision times, since writing down a motivation requires time, but it can also trigger a specific form of reflection aimed at finding a motivation. Therefore, the time delay condition and the motivated delay condition, while both hinging upon time delay, differ one from the other because the latter also requires actively reflecting on one's own motivations while the former typically does not. While in many situations this difference may not play any substantial role, we conjecture that it does play a role in social contexts where moral judgment and social norms are relevant. The reason is that actively thinking about a motivation for one's own decision may affect the salience and relevance of moral judgments and social norms. For instance, by asking a

decision-maker to motivate why she wants to allocate money between herself and another person in a certain way, we can expect to make the decision-maker reflect upon what she, her peers, or the society, think to be the right thing to do.

The Dictator Game (Forsythe et al., 1994; Engel, 2011) is a simple game where the decision-maker is called to allocate money between herself and another recipient. Decision-making in dictator games are likely to involve both moral judgment and social norms. More precisely, we employ the two variants of the Dictator Game known as "bully" and "non-bully" (Krupka and Weber, 2013). In the bully variant the initial endowment of money is equally distributed between the decision-maker and the other recipient, while in the non-bully variant the decision-maker is initially endowed with all the money. This difference in initial endowments is likely to trigger different judgments of what is fair or acceptable, individually or socially, due to the great importance of the notion of private property in modern societies. At the same time, manipulating initial endowments is likely to induce subjects to focus on the normative appropriateness of actions per se, rather than on the consequences of decisions on final allocations, thus making deontological considerations more salient than utilitarian (Gawronski et al., 2017; Baron and Goodwin, 2020; Gawronski et al., 2020; Baron and Goodwin, 2021).

In this paper we run an experiment to compare the effects of a time delay condition and a motivated delay condition (with respect to a baseline condition) on allocation decisions in the Dictator Game, for both the bully and non-bully variants. This is meant to address our primary question on potential differences between the time delay condition and the motivated delay condition in a setting which is prone to moral judgments and where social norms are likely to play a role. The experiment also allows to test, in an online setting, previous results in the literature obtained in a lab setting. Further, we collect empirical expectations, normative beliefs and normative expectations (Bicchieri and Xiao, 2009). Empirical expectations are what we expect others to do. Normative beliefs are what ought to be done. Normative expectations what we expect others think we should do. We attempt to assess the role of empirical expectations, normative beliefs and normative expectations in allocation choices.

We are not the first to investigate the effect on Dictator Game of an exogenous manipulation of the mode of cognition.[1] In particular, our research relates to those studies exploring

[1] Capraro (2019) provides an extensive survey of the literature.

the effect of time delay on Dictators' decision and for which the evidence is not univocal. Although a substantial portion of these studies finds no effect (Carlson et al., 2016; Tinghög et al., 2016; Andersen et al., 2018), in others delaying the Dictator's decision results in more giving (Mrkva, 2017), or less (Grolleau et al., 2018; Chuan et al., 2018).

The experimental evidence that we collect provides a number of findings. First, the dictator keeps less for herself in the bully variant, confirming in the online setting what has been found in a lab setting (Krupka and Weber, 2013). Second, in the motivated delay condition the dictator keeps less for herself with respect to the baseline condition, while this is not the case for the time delay condition. Third, empirical expectations, normative beliefs and normative expectations elicited for the bully Dictator Game are not significantly different from those elicited for non-bully Dictator Game, notwithstanding the fact that our experimental design embedded dedicated graphic aimed at fostering the salience of the initial distribution of endowments; this finding differ from what has been found in a lab setting (Krupka and Weber, 2013) where endowments were made salient by providing them physically.

Overall, our findings suggest that requesting decision-makers to motivate their decisions may affect behavior beyond the mere fact that providing a motivation requires time, at least in the context like the Dictator Game. In particular, since asking to provide a motivation leads dictators to keep less for themselves and be closer to the fifty-fifty split, we can conjecture that asking people to motivate their decisions is an effective tool to promote decisions which are more in line with moral preferences and norms.

2 Methods

The experiment was implemented in oTree (Chen et al., 2016) and conducted on the online platform Prolific.co (Palan and Schitter, 2018) in July 2020. We recruited 1,022 participants living in the US at the time of the experiment. The experiment lasted on average 6 minutes and participants received a participation fee of 0.32 USD. The design and the analyses were pre-registered on AsPredicted.org including the *a priori* power analysis for our sample size (pre-registration number 44855).

2.1 Experimental conditions

Cognition was manipulated by means of two conditions: time delay and motivated delay. In the Time Delay (TD) treatment participants were asked to wait 40 seconds before making their decision; in the Motivated Delay (MD) treatments participants were asked to write a short text (of at least 40 characters) providing a motivation for their choice while also waiting 40 seconds before making their decision; lastly, in a Control (C) treatment participants were asked to make their decision without any time constraint or request of motivations.

Following Krupka and Weber (2013), we attempted to manipulate perceived norms by presenting subjects either with a standard Dictator Game (DG) or a Bully Dictator Game (BDG). In the DG the dictator decided how to allocate 0.60 USD between herself and the receiver, starting from an initial allocation of 0.60 USD for the dictator and 0 for the receiver. In the BDG, the dictator decided how to allocate the same total amount, but starting from the equal split of 0.30 USD for the dictator and 0.30 USD for the receiver.

Table 1: Number of participants for each of the 3x2 experimental conditions

	Control	Time Delay	Motivated Delay
Standard Dictator Game	DG-C (N=174)	DG-TD (N=169)	DG-MD (N=166)
Bully Dictator Game	BDG-C (N=176)	BDG-TD (N=174)	DG-MD (N=163)

Note. *Control*: decision without any time constraint or request of motivations. *Time Delay*: decision delayed 40 seconds. *Motivated Delay*: decision with a written motivation and delayed 40 seconds. *Standard Dictator Game*: Dictator initially endowed with 0.60 USD who decides how much to give to the receiver. *Bully Dictator Game*: Dictator initially endowed with 0.30 USD who decides how much to give or take from the receiver initially endowed with 0.30 USD.

The 3x2 scheme in Table 1 summarizes the six conditions to which participants were randomly assigned and reports the number of subjects in each of them. The slight unbalance between treatments, and in particular the decrease in the number of observations in the time delay treatment, is not unexpected. The occurrence of dropouts is one of the limitations of the online experimental setting. However, at least to some extent, the fact that some subjects leave the experiment can be ascribed to exogenous factors. For instance, the time spent on the main task is correlated with the probability of unintentional drop out, and

participants spent on average more in the treatments where we had more dropouts (see Section 3). On the other hand, we cannot in principle exclude that sample selection that is endogenous to treatments. To check for this, we can look at the composition of samples across treatments. Table 2 shows that all six samples are statistically similar with respect to several socio-demographic characteristics.

Table 2: Differences across treatments of socio-demographic characteristics

Demographic	*Test*	p
Female	χ^2	0.5274
Age	Kruskal-Wallis	0.5098
Household income	Kruskal-Wallis	0.2862
Children	χ^2	0.821
Full time job	χ^2	0.171
Christian	χ^2	0.339
Student	χ^2	0.994
Democrat	χ^2	0.549

Note. *Female*: 1 if female; 0 if male. *Age*: integer number *Household income*: variable ranging 0, 1, ..., 12 where 0 is household income $<$ 10000 USD and 12 is household income $>$ 150000 USD. *Children*: 1 if household with at least one child; 0 if not. *Full time job*: 1 if full time employment; 0 if not *Christian*: 1 if Christian; 0 if not. *Student*: 1 if student; 0 if not *Democrat*: 1 if Democrat; 0 if not. The third column lists the probabilities, p, of having a different distribution across the 6 experimental conditions, respectively computed with the tests indicated in the second column.

We elicited participants' personal normative orientations and social expectations referred to the decision task (Bicchieri and Xiao, 2009; Bicchieri and Chavez, 2010), providing material incentives for empirical and normative expectations, not for normative beliefs.

We also administered a variant of the Cognitive Reflection Test (Frederick, 2005) and, lastly, a self-reported measure of how much the participants reflected in the main task. This latter measure was added in order to have an alternative way to evaluate the effectiveness of the cognitive manipulations to induce reflection.

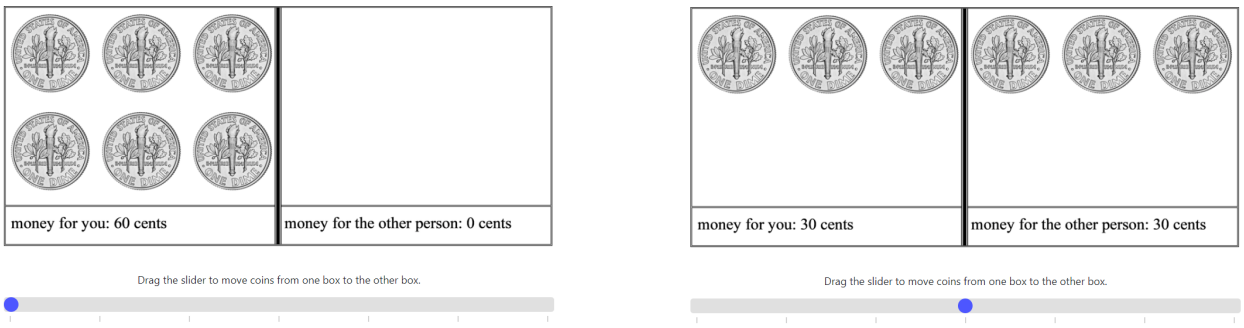
2.2 Experimental protocol

The online setting requires simple and readable instructions to avoid the risk that contextual conditions may distract participants and drive their attention away from the experimental tasks. To this purpose, we provided very succinct and plain instructions minimizing the cognitive load and reading time, using graphical elements and user-friendly tools. All screens showed to participants during the experiment can be found in the Supplementary Material.

After giving their informed consent, participants were presented with the task description explaining that each participant would have been paid as dictators or receivers of other dictators' decisions with a 50% probability. In the same screen participants where told what task they would have to go through, depending on the treatment: for C simply make a decision, for TD wait for forty seconds before making a decision, and for MD wait for forty seconds and write a motivation before making a decision.

Both the DG and the BDG were presented in the following screen, in the way shown in Figure 1. As can be noted, the difference between the DG and the BDG lies in the initial allocation of the endowments, which was highlighted by means of a graphical distribution of six ten-cent coins. In this way we could provide participants with a simple and clear picture of initial endowments without having them to read and think too much about. Subsequently, participants could alter the initial distribution by operating the slider below the cells, moving one by one the coins from one box to the other and then, when satisfied with their choice, implement their decisions by clicking on the "confirm" button. By devising the decision task as a concrete manual operation causing a perceivable change in the representation of the coin allocation – rather than for example a merely numerical list of distributions in a radio button – we aimed at reproducing online the setting of the decision task in Krupka and Weber (2013) (i.e. the concrete operation of moving money from two envelops respectively addressed to the dictator and the receiver) making both the initial allocation and the decision to change it more salient and tangible to participants.

The actual screen of the decision task varied depending on the treatments. In the C treatment participants were immediately allowed for operating the slider and click the confirmation button. In the TD treatment participant could not operate the slider and confirm the chosen allocation for the first 40 seconds, with both the slider and the button kept invisible during this time. The same happened in MD treatment with the only difference that during the first 40 seconds participants were asked to write a motivation long at least 40



Non-Bully Variant

Bully Variant

Figure 1: Task screens of the Standard Dictator Game and the Bully Dictator Game. The dictator changes the initial allocation by operating the slider below the boxes. As the position of the slider changes, the coins move between the two boxes representing the dictator's account (left) and the receiver's account (right), respectively.

characters; in particular, the slider and the confirmation button became clickable only when the participants had typed at least 40 characters.

Two reasons motivated our decision to hide the slider and the confirmation button for the initial 40 seconds in TD and MD. In the first place, by making the initial allocation not modifiable for 40 seconds we further highlighted endowments. In the second place, by keeping the same protocol we maximized the comparability of the TD and MD treatments. This would not had been the case if operating the slider was made available: moving coins would had become an action in alternative to writing the motivation.

The task was immediately followed by the elicitation of norms. We followed Bicchieri and Xiao (2009); Bicchieri and Chavez (2010) and measured empirical expectations (EE), personal normative beliefs (NB) and normative expectations (NE). Accordingly, in each experimental treatment, we asked subjects the following set of questions respectively for eliciting EE, NB and NE:

EE Consider the allocation task you faced.
Which allocation do you believe is chosen mostly by the other participants?

NB Consider again the allocation task you faced.
Which allocation do you believe ought to be chosen?

NE Which allocation do you believe is chosen mostly by the other participants in the above

question?

We separated in two different screens the question regarding EE from the questions regarding NB and NE in order to minimize cross-contamination of responses. Only EE and NE were incentivized, specifically by paying 0.10 USD for each correct answer. The very small magnitude of the incentives and the lack of transparency of the potential for hedging risks by coordinating answers to these questions and the choice in the task, suggest that the risk of behavior being influenced by hedging motives is minimal (Blanco et al., 2010).

Subsequently, a modified 6-item Cognitive Reflection Test (CRT) (Primi et al., 2016) task was administered, where we slightly reworded the first three well known items taken from Frederick (2005) in order to avoid the recognition of these tasks by subjects.

Lastly, we asked participants to report how much they carefully reflected on the main task. Specifically, we asked participants how much they agreed (measured on a 0-to-10 Likert scale) on a sentence stating that they carefully reflected on the allocation task.

2.3 Research questions and preregistered analysis

The described experimental setup was designed in order to answer to three pairs of research questions:

1. Are allocation choices in DG different under TD, MD and C? If this is the case, in which treatment the dictator gets a larger share?

2. Are allocation choices in the BDG different under TD, MD and C? If this is the case, in which treatment the dictator gets a larger share?

3. Do allocation choices under TD, MD and C differ between DG and BDG? If this is the case, in which variant of the game the dictator gets a larger share?

In the next section we attempt to provide answers to these questions relying on the method of analysis that we pre-registered along with the questions, including the a priori power analysis for our sample size. For more details on this part of the preregistration see pre-registration n.44855 on AsPredicted.org.

3 Results

3.1 Effectiveness of cognitive manipulation

We begin with two preliminary checks of the effectiveness of the cognitive manipulations employed. The first check is relative to the self-reported extent of reflection during the main task. Figure 2 shows that both the TD treatment and the MD treatment generated a higher self-reported extent of reflection (Kruskal-Wallis test, χ^2=5.749, p=0.0564), in particular with the one reported in the MD treatment being statistically significantly higher (Mann-Whitney test, z=2.340, p=0.0193). The second check is relative to the time actually spent on the main task. Figure 3 shows that both the TD and MD treatments led participants to spend substantially more time on the screen of the main task than the C treatment did (Kruskal-Wallis test, χ^2=633.3, p=0.0001), suggesting that the time constraint was effectively delaying decisions. We also see that it took a longer time in the MD treatment than in the TD treatment (Mann-Whitney test, z=9.340, $p < 0.0001$), suggesting that participants did not perfectly substitute writing and waiting. Overall, these figures provide a good indication that the cognitive manipulations were effective, in line with the "default interventionist" model of moral judgment, according to which slower responses often arise from a system-two correction on utilitarian grounds of system-one deontological intuitions (Baron and Gürçay, 2017).

3.2 Main Analysis

To answer our first two research questions we test if allocation choices in the DG and in the BDG are different under the TD treatment, the MD treatment, and the C treatment, and, in the case that a difference is detected, we check in which treatment the dictator gets a larger share. Henceforth, we use "Kept" to indicate the variable that records the dictator's share. Figure 4 reports average values of Kept in the DG, which appear not to be statistically different across the TD, MD, and C treatments (Kruskal-Wallis, p=0.5204). Figure 5 reports average values of Kept in the BDG, which instead appear to be statistically different across the TD, MD, and C treatments (Kruskal-Wallis, p=0.0145). Pairwise comparisons to test differences between treatments show that dictators on average kept less for themselves in the MD treatment with respect to both the TD treatment (Mann-Whitney test, z=2.467, p=0.0136) and the C treatment (Mann-Whitney test, z=2.659, p=0.0078), whereas no sta-

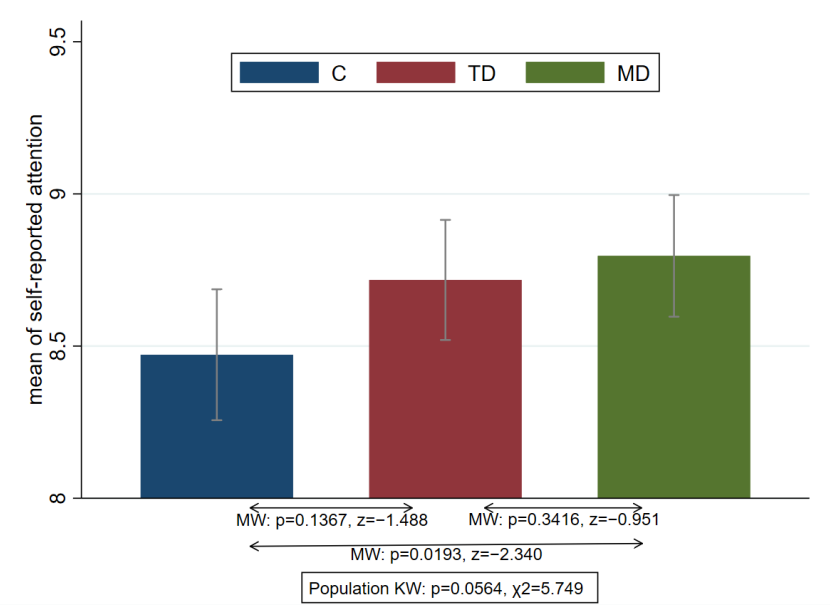


Figure 2: **Self-reported reflection is higher in the Motivated Delay treatment than in the Control treatment and is not different from the self-reported reflection in the Time Delay treatment.** The average of self-reported reflection in the Motivated Delay treatment (M=8.79, SD=1.85) is 0.32 points higher than that in the Control treatment (M=8.47, SD=2.05) and not different from self-reported reflection in the Time Delay treatment (M=8.72, SD=1.86). Note. In the figure, *KW* stands for the Kruskal-Wallis equality-of-populations rank test and *MW* for the Wilcoxon rank-sum (Mann-Whitney) test.Confidence intervals on means are at 95%

tistically significant difference appears to emerge when comparing the TD and C treatments (Mann-Whitney test, z=0.289, p=0.7723).

To answer our third research question we test if, for each of the TD, MD and C treatments, Kept differs between the DG and BDG conditions, and in the case that a difference is detected, we check under which condition the dictator gets a larger share. Figure 6 reports average values of Kept for the DG and BDG conditions. We see that Kept, on average, is smaller in BDG than in DG in all cases, but only in the MD treatment the difference between the two conditions is statistically significant (Mann-Whitney test, z=2.595, p=0.0095).

3.3 Secondary Analysis

We further investigate whether the findings of our main analysis are robust to an array of controls. Specifically, we check if, once we control for EE, NB, and NE, the experimental

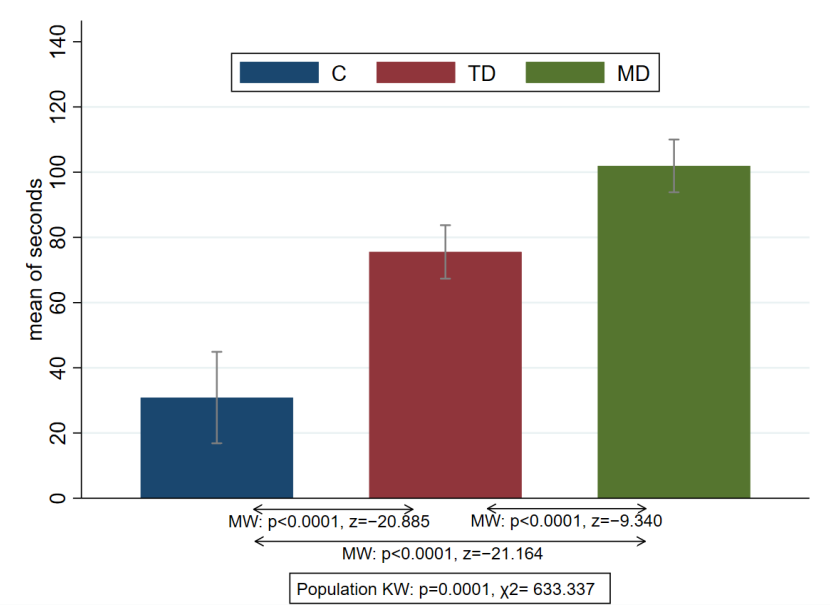


Figure 3: **Subjects spent more time on the task screen in the Time Delay and Motivated Delay treatments than in the Control Treatment; and more time in the Motivated Delay treatment than in the Time Delay treatment.** The average of seconds spent on the task screen in the Motivated Delay treatment (M=101.93, SD=74.71) is 26,39 seconds higher than those spent in the Time Delay (M=75.54, SD=77.37), which are in turn 44,67 seconds higher than the average of seconds spent on the task screen in the Control treatment (M= 30.87, SD= 133.71). Note. In the figure, *KW* stands for the Kruskal-Wallis equality-of-populations rank test and *MW* for the Wilcoxon rank-sum (Mann-Whitney) test. Confidence intervals on means are at 95%

conditions still affect the dictators' decision. Furthermore, we also control for CRT, sex and income. In the following analysis we use Tobit regressions since the main dependent variable, Kept, is bounded on both sides and has a non-negligible number of extreme values.

No causal claim can be made regarding the impact of EE, NB and NE on Kept, since EE, NB and NE are not necessarily exogenous to Kept. In addition, EE, NB, and NE might be affected by the experimental conditions. However, while we cannot test the exogeneity of EE, NB, and NE to Kept, we can check if they are affected by the experimental conditions. In Figure 7 we report the means of the three norms distinguishing by cognitive manipulation and by version of Dictator Game. The non-parametric analysis reported in caption suggests the absence of any effect on the three norms for our treatment variables, although we register a mild effect on NB for cognitive manipulation. Table 3 reports the estimates for three Tobit

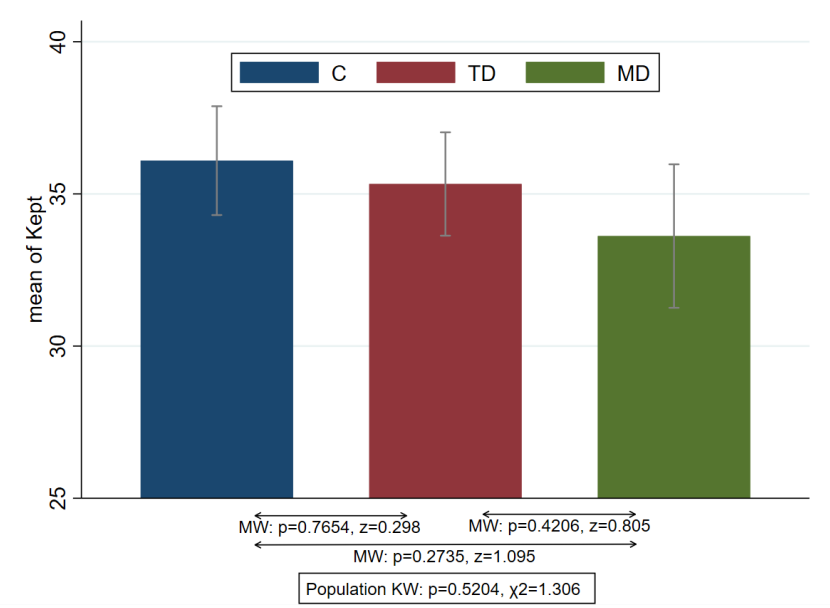


Figure 4: **In the standard Dictator Game, the amount kept by the dictators does not differ under the different cognitive manipulations and the control treatment.** There is no statistically significant difference among the average of money kept by the dictators in the Control (M=36.09, SD=12.01), the Time Delay (M=35.32, SD=11.23), and the Motivated Delay (M=33.61 , SD=15.45) treatments. Note. In the figure, *KW* stands for the Kruskal-Wallis equality-of-populations rank test and *MW* for the Wilcoxon rank-sum (Mann-Whitney) test.Confidence intervals on means are at 95%

regressions where, respectively, EE, NB, and NE are regressed on dummies for the TD, MD and BDG conditions (omitted category is the case of the DG and C conditions). No estimated coefficient of these regressors is significantly different from zero, confirming that EE, NB, and NE are not affected by our experimental conditions.

We can hence look at how Kept is affected by our treatment variables controlling for EE, NB, and NE, and, in addition, for CRT and demographics. Table 4 reports the results of four Tobit regressions. In model (1), and consistently in the other three models, we find a negative and significant effect of BDG and MD on Kept. In model (2), both EE and NB have a positive and statistically significant coefficient, while both TD and NE have a negative and not statistically significant coefficient. Note that EE, NB, and NE are elicited at the individual level, so that the corresponding coefficients indicate the partial correlation between one's own decisions (Kept and elicited norm). So, while the findings of the main

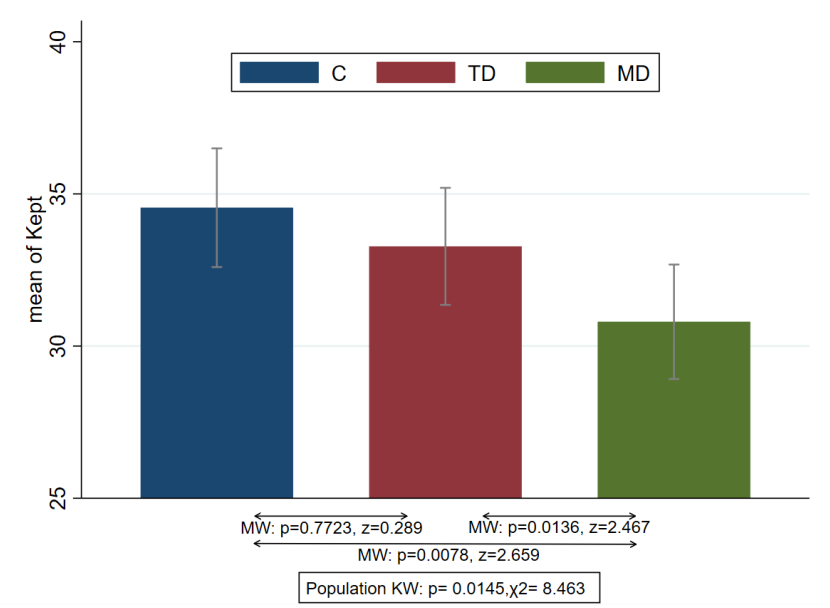


Figure 5: **In the Bully Dictator Game, the dictators keep the lowest amount under Motivated delay.** The average amount of money kept by the dictators in the Motivated delay treatment (M= 30.80, SD=12.22) is 2,48 USD lower than that kept in the Time Delay treatment (M=33.28 , SD=12.91), and 3,74 USD lower than the amount of money kept by the dictators in the Control treatment (M=34.54, SD=13.17). The difference between the amount of money kept by the dictator in the Time Delay and in the Control treatments is not statistically significant. Note. In the figure, *KW* stands for the Kruskal-Wallis equality-of-populations rank test and *MW* for the Wilcoxon rank-sum (Mann-Whitney) test. Confidence intervals on means are at 95%

analysis regarding the effects of the experimental conditions on Kept are confirmed by the Tobit regression, we also see that such findings are not washed out by controlling for elicited norms, which in turn appear not to be affected by the experimental conditions. Together these findings suggest that the experimental conditions do not affect Kept trough norms, with the only potential exception of NB.

In models (3) and (4) we add controls for CRT and demographics. For the CRT we build two distinct variables, one counting the number of correct answers ("CRT right", ranging from 0 to 6), which should measure the inclination to reflection, and one variable counting the number of wrong answers that may be considered more intuitive ("CRT int", ranging from 0 to 6), which should measure the inclination to answer more intuitively. While CRT right is a standard measure, CRT int is relatively less reliable, having been shown to

Table 3: Tobit regressions of elicited norms on experimental conditions

	(1) EE	(2) NB	(3) NE
BDG	0.0693	-0.399	-0.0731
	(0.925)	(0.716)	(0.757)
TD	-0.256	0.179	-0.267
	(1.106)	(0.844)	(0.898)
MD	-1.514	-1.334	-0.116
	(1.162)	(0.886)	(0.943)
log likelihood	-3718.3	-3712.3	-3736.7
N	1022	1022	1022

Note. Dependent variables. *EE* (empirical expectations): variable ranging 0.10, 0.20, ... 0.60. *NB* (normative beliefs): variable ranging 0.10, 0.20, ... 0.60. *NE* (normative expectations): variable ranging 0.10, 0.20, ... 0.60.
Regressors. *BDG*: 1 if Bully Dictator Game and 0 if standard Dictator Game. *TD*, 1 if time delay treatment and 0 otherwise; *MD*: 1 if Motivated Delay treatment and 0 otherwise.
Significance of coefficients: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

have weak correlation with other measures of reliance on intuition (Pennycook et al., 2016). Nevertheless, model (3) and (4) provide a consistent picture regarding the CRT. In model (3), the coefficient CRT int is positive and statistically significant, suggesting that dictators who are less inclined to reflection tend to keep more for themselves. In model (4), the estimated coefficient of CRT right is negative and statistically significant, suggesting that dictators who are more inclined to reflection tend to keep more for themselves. Lastly, socio-demographic characteristics (sex and household income) do not seem to affect the dictator's decision in either model.

4 Discussion

We have investigated how decisions in a Dictator Game played online are affected by two distinct cognitive manipulations aimed at promoting greater reliance on deliberation, using two distinct initial allocations of endowments with the purpose of influencing moral judgment and norm compliance. We have found that a more equal initial endowment leads the dictator

to keep less for herself, confirming in the online setting previous evidence from the lab (Krupka and Weber, 2013). Moreover, our findings suggest that the request to write a motivation for the allocation decision reduces the amount of money that the dictator keeps for herself, while the mere request to wait some time before choosing does not have appreciable behavioral effects. One interpretation posits that our results are produced by the interaction of a cognitive manipulation which primes choice values (the motivation condition) with a decision involving moral judgment and norm compliance (the bully and non-bully variants of the Dictator Game). To better assess the validity of this explanation, it would be useful to run a similar experiment in a more neutral context, devoid of moral considerations. This would allow to reject alternative explanations, like the one based on the idea that, in online settings, attention gets reduced in case of time delay, while this is not so in case of motivated delay, with the latter only increasing deliberation due to the switch to the engaging activity of writing a motivation (Bohannon, 2016; Chandler et al., 2014). Below we discuss a number of methodological issues that we had to deal with during the design of the experiment, which admittedly may be tackled in different ways, generating outlines for future research.

Norms are often used as explanatory variables of behavior, being formed in daily life experience and then taken by the experimental subjects into the lab setting. Coherently with this view, norms should be elicited independently from the experimental task, so not to incur the risk of declarations that are affected by own behavior. Krupka and Weber (2013) relied on a clever design to address this issue, eliciting norms from a sample of individuals which is different from the one of decision-makers, by asking them to guess social norms in an incentive compatible way. In our setting we might have relied on a similar procedure for the six cases: the two variants of the Dictator Game (bully and non-bully) combined with the three conditions regarding cognitive manipulations (control, time delay, motivated delay). We opted not to do so, because we believe that stepping into the shoes of participants who experience unfamiliar cognitive manipulations, without direct experience of the manipulation itself, may require too much of imagination and possibly lead to unreliable elicitation of norms. Rather, we have preferred to ask subjects soon after experiencing the experimental condition, which also allows us to assess whether elicited norms are affected by the cognitive manipulations. In this way we have given up the possibility to inquiry the causal relationship that goes from norms to behavior, but we have a potentially superior control at the individual level for analyzing the causal relation that goes from our experimental conditions to both

behaviors and norms.

Another issue concerns our choice to work with the bully and non-bully variants of the Dictator Game. A prominent alternative is represented by the Social Value Orientation (SVO), which is widely used in the literature to measure altruism and prosociality (Van Lange et al., 1997; Murphy et al., 2011; Murphy and Ackermann, 2014; Dolton et al., 2019). We note that cognitive manipulations have more clearly identifiable effects in single decisions, while the SVO requires at least six distinct decisions to be taken. In settings where multiple decisions have to be made, two main alternatives are possible: cognition can be manipulated just for the first decision, or for all decisions. Whatever the choice, biased effects may show up in later decisions, due to the combination of the effects of one or more manipulations with those of prior decisions taken. A solution may be to restrict the analysis on the first decision only, but this would largely reduce the desirability of additional decisions after the first – which adds burden on experimental subjects. Hence, we preferred to present just a single decision to be made. Further, the differentiation of the initial endowments, as done in the bully and non-bully variants that we have employed, are in our opinion more likely to trigger reliance on well-formed norms (based on property rights) for intuitive decision-making, with respect to the questions used to measure SVO which are more unusual and abstract and which make calculations reasonably more salient.

A final remark is about the cognitive mode which is mostly relied upon in the online setting. Online experiments are characterized by shorter procedures and lower stakes with respect to laboratory experiments, which reasonably increase the likelihood that participants make quicker and more intuitive decisions. This leads us to believe that, in online experiments, conditions increasing the reliance on deliberation may produce starker and hence more easily identifiable effects, if compared with treatments increasing the reliance on intuition. This observation has contributed to our choice to focus on cognitive manipulations aimed at promoting deliberative decisions.

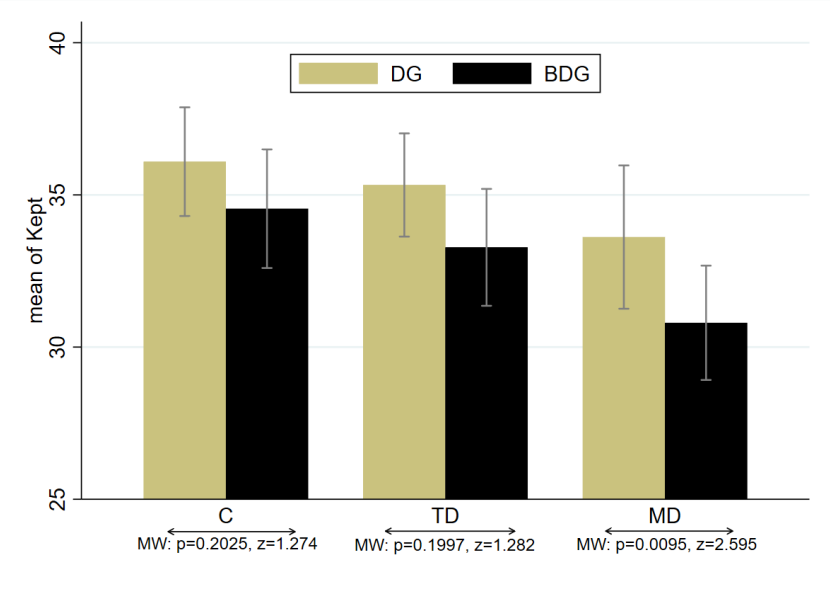


Figure 6: **Only under motivated delay the amount kept by the dictator in the Bully Dictator game is lower than that in the standard Dictator game.** The average amount kept by the dictator under Motivated Delay is lower in the Bully variant of the dicator game (M=30.80, SD=12.22) than in the standard one (M=33.61, SD=15.46). The average amount kept by the dictator under Time Delay is lower in the Bully variant of the Dictator game (M=33.28, SD=12.9) than in the standard one (M=35.33, SD=11.24). The average amount kept by the dictator in the Control treatment is lower in the Bully variant of the dictator game (M= 34.54, SD=13.17) than in the standard one (M=36.09, SD=12.01). However, the difference between the two variants of the dictator game is statistically significant only in the case of Motivated Delay (Mann-Whitney test, z=2.595, p=0.0095) Note. In the figure, KW stands for the Kruskal-Wallis equality-of-populations rank test and MW for the Wilcoxon rank-sum (Mann-Whitney) test. Confidence intervals on means are at 95%

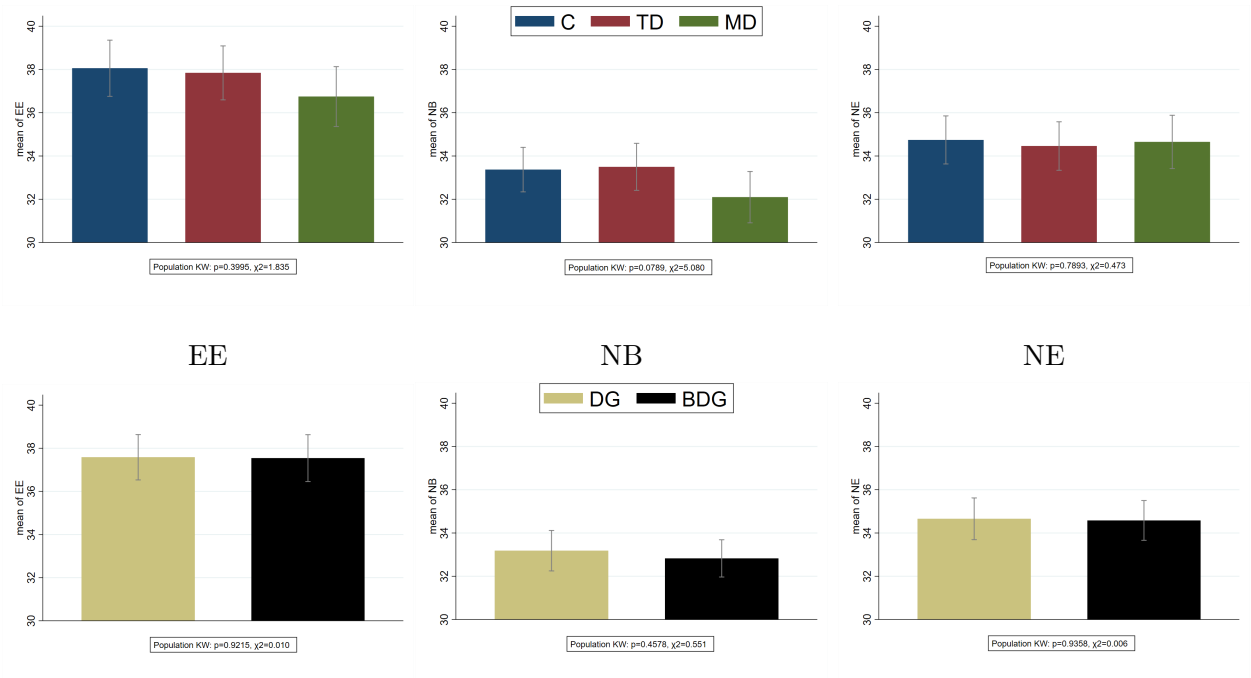


Figure 7: **The elicited norms a) do not differ under the different cognitive manipulations and the control, b) do not differ between the standard and the Bully Dictator Game** The difference in the means of Empirical Expectations (EE) , Normative Beliefs (NB) and Normative Expectations (NE) are not statistically significant neither with respect to cognitive manipulations nor to variants of the dictator game.We only note a mild effect of the cognitive manipulation on NB

Table 4: Tobit regressions of Kept on experimental conditions and controls

Kept	(1) baseline	(2) norms	(3) right	(4) intuitive
BDG	-2.302**	-2.023***	-2.035***	-2.027***
	(.952)	(0.733)	(0.737)	(0.737)
TD	-1.368	-1.262	-1.126	-1.116
	(1.110)	(0.886)	(0.878)	(0.877)
MD	-3.626***	-2.075**	-2.005**	-2.038**
	(1.219)	(0.914)	(0.915)	(0.915)
EE		0.371***	0.358***	0.357***
		(0.050)	(0.049)	(0.050)
NB		0.776***	0.785***	0.781***
		(0.068)	(0.068)	(0.068)
NE		-0.075	-0.070	-0.067
		(0.053)	(0.053)	(0.054)
CRT right/int			0.418**	-0.540**
			(0.191)	(0.213)
female			0.007	0.075
			(0.733)	(0.733)
household income			-0.010	-0.001
			(0.100)	(0.099)
log likelihood	-3795.5	-3521.9	-3507.9	-3507.1
N	1022	1022	1019	1019

Note. Dependent variable. *Kept* (dictator's share): variable ranging 0.10, 0.20, ... 0.60.
Regressors. *BDG*: 1 if Bully Dictator Game and 0 if standard Dictator Game. *TD*, 1 if time delay treatment and 0 otherwise; *MD*: 1 if Motivated Delay treatment and 0 otherwise. *EE* (empirical expectations): variable ranging 0.10, 0.20, ... 0.60. *NB* (normative beliefs): variable ranging 0.10, 0.20, ... 0.60. *NE* (normative expectations): variable ranging 0.10, 0.20, ... 0.60. *CRT right* (cognitive reflection test with "right" as number of correct answers) integer from 1 to 6 (model 3). *CRT int* (number of intuitive answers) integer from 1 to 6 (model 4).
Significance of coefficients: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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Supplementary Material

1.1 Task Description: Control

Task Description

Your task is to choose how to allocate **$0.60** between you (**decision-maker**) and a randomly picked participant (**receiver**).

There is a 50% chance that you and the receiver will be paid according to the allocation that you decide. If this does not happen, then you will be paid according to the allocation decided by a different randomly picked participant acting as a decision-maker in the same task (where you will be the receiver).

Next

1.2 Task Description: Time Delay

Task Description

Your task is to choose how to allocate **$0.60** between you (**decision-maker**) and a randomly picked participant (**receiver**).

In the next screen, you will have to **wait 40 seconds** before you can make a decision.

There is a 50% chance that you and the receiver will be paid according to the allocation that you decide. If this does not happen, then you will be paid according to the allocation decided by a different randomly picked participant acting as a decision-maker in the same task (where you will be the receiver).

Next

1.3 Task Description: Motivated Delay

Task Description

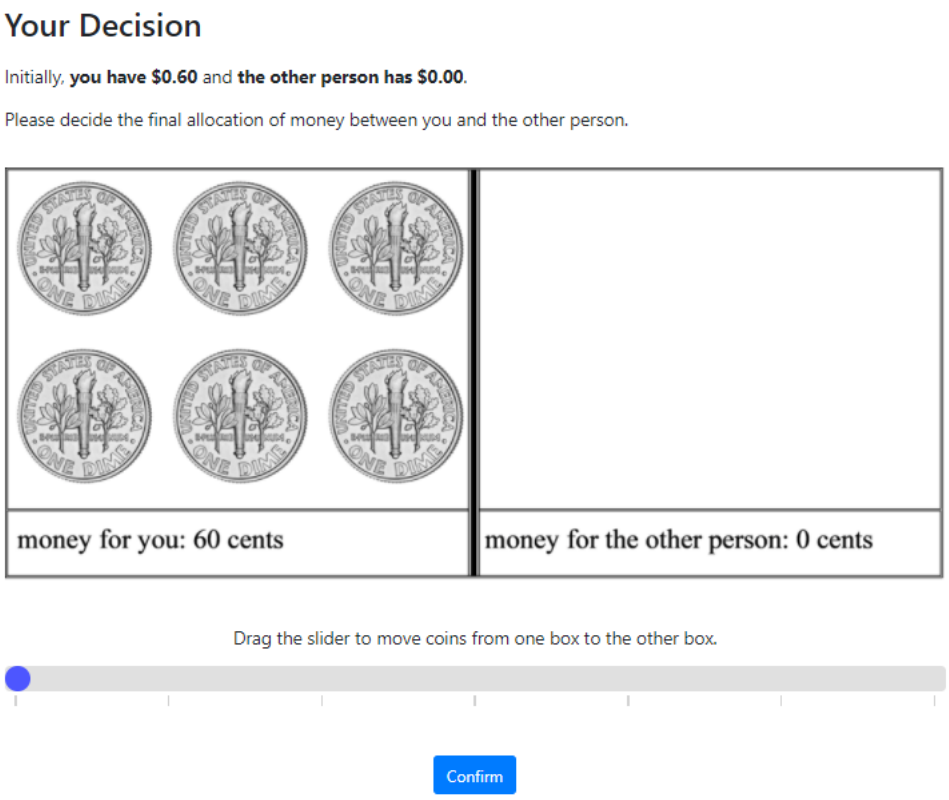
Your task is to choose how to allocate **$0.60** between you (**decision-maker**) and a randomly picked participant (**receiver**).

In the next screen, you will have to **write a motivation** and **wait 40 seconds** before you can make a decision. Motivations will not be read by other participants.

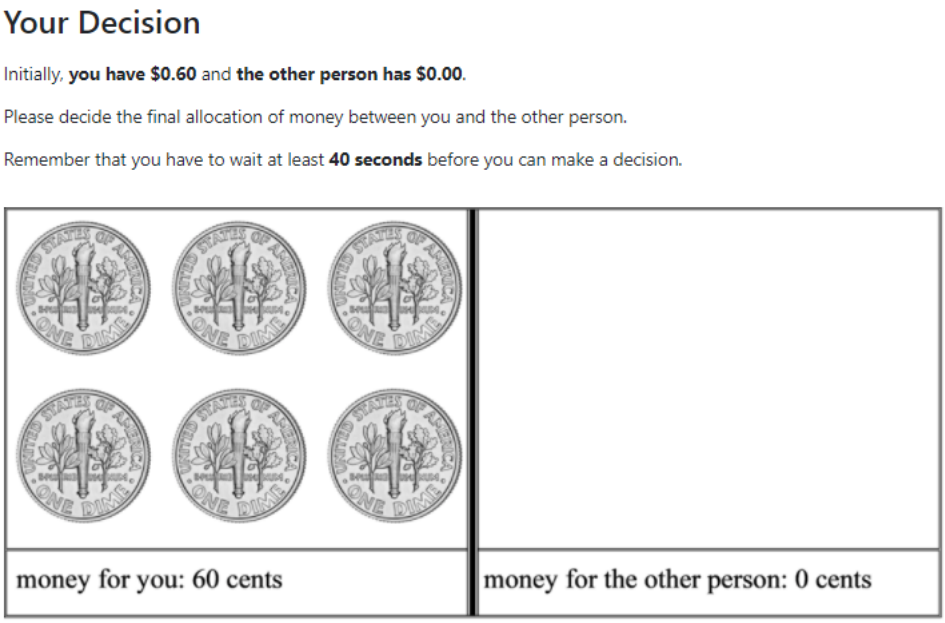
There is a 50% chance that you and the receiver will be paid according to the allocation that you decide. If this does not happen, then you will be paid according to the allocation decided by a different randomly picked participant acting as a decision-maker in the same task (where you will be the receiver).

Next

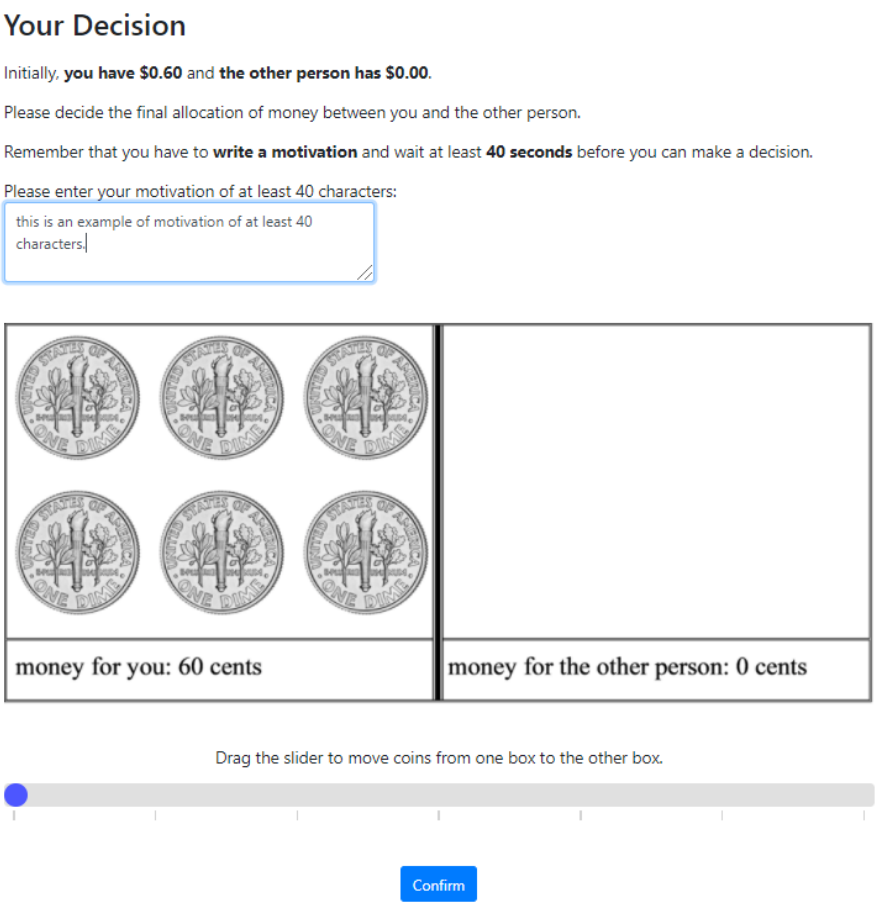
2.1.1 Decision screen: Dictator Game and Control



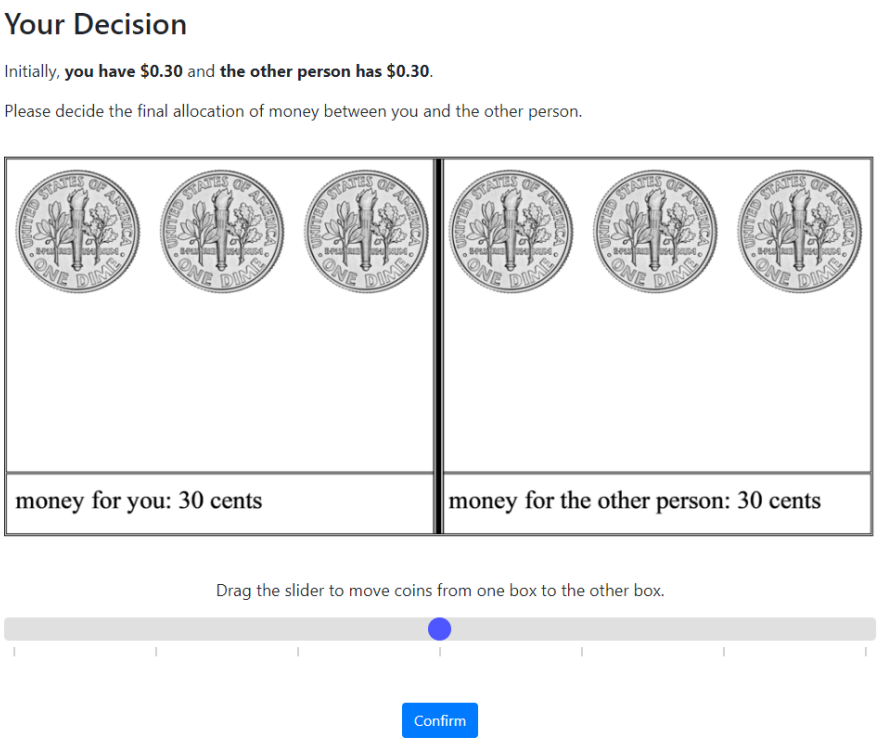
2.1.2 Decision screen: Dictator Game and Time Delay



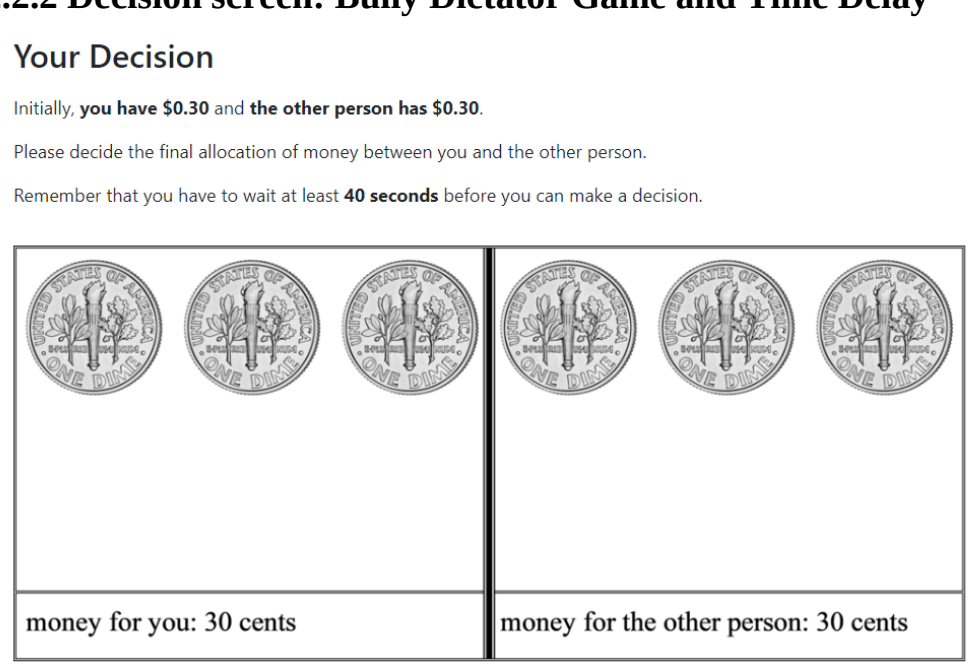
2.1.3 Decision screen: Dictator Game and Motivated Delay



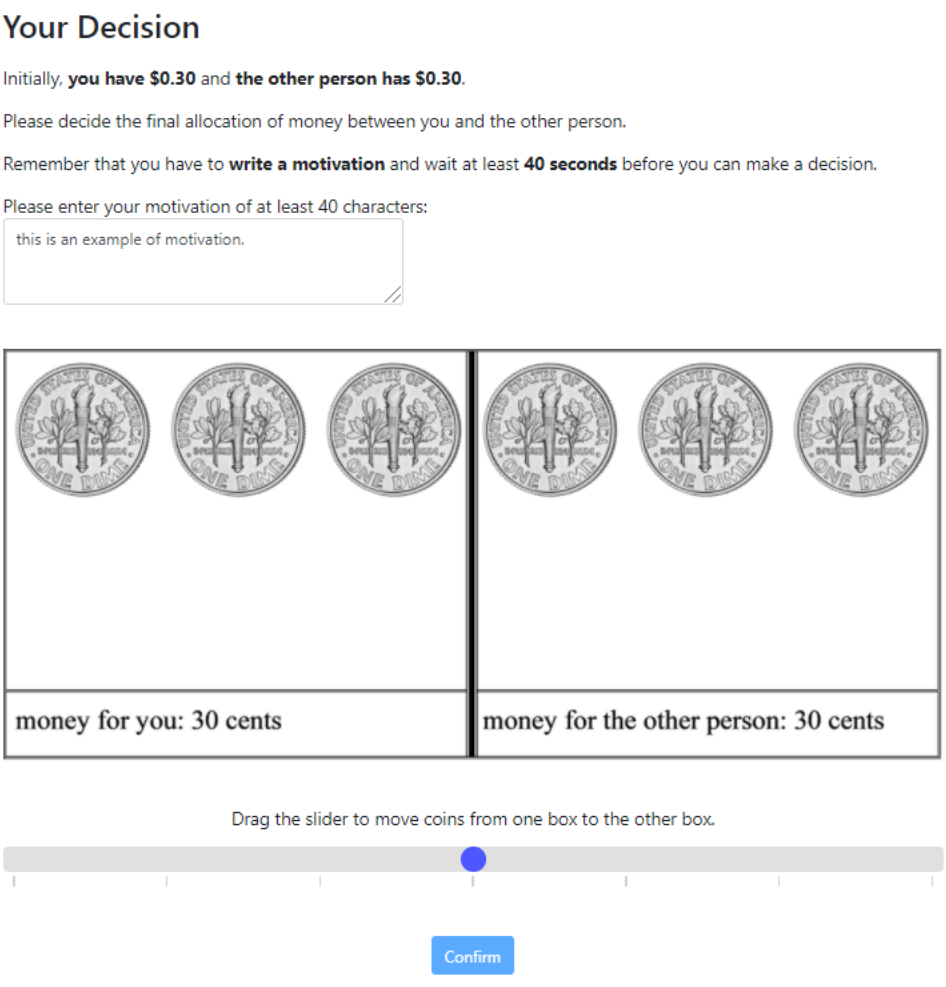
2.2.1 Decision screen: Bully Dictator Game and Control



2.2.2 Decision screen: Bully Dictator Game and Time Delay



2.2.3 Decision screen: Bully Dictator Game and Motivated Delay



3.1 Elicitation of Empirical Expectations

Your Opinion

Consider the allocation task you faced.

Which allocation do you believe is chosen mostly by the other participants?

You will receive **additional $0.10** if you select the option that is chosen mostly by the **other participants** faced with **your own allocation task**.

Decision-maker gets	60	50	40	30	20	10	0
Receiver gets	0	10	20	30	40	50	60
	○	○	○	○	○	○	○

Next

3.2 Elicitation of Personal Normative Beliefs and Normative Expectations

Your Opinion

Consider again the allocation task you faced.

Which allocation do you believe ought to be chosen?

Decision-maker gets	60	50	40	30	20	10	0
Receiver gets	0	10	20	30	40	50	60
	○	○	○	○	○	○	○

Which allocation do you believe is chosen mostly by the other participants in the above question?

You will receive **additional $0.10** if you select the option that is chosen mostly in the **above question** by the **other participants** faced with **your own allocation task**.

Decision-maker gets	60	50	40	30	20	10	0
Receiver gets	0	10	20	30	40	50	60
	○	○	○	○	○	○	○

Next

4 Cognitive Reflection Test

Survey

Please answer the following questions.

A pen and a paper cost $1.10 in total. The pen costs $1.00 more than the paper. How much does the paper cost?

cents

If it takes 5 nurses 5 minutes to measure the blood pressure of 5 patients, how long would it take 100 nurses to measure the blood pressure of 100 patients?

minutes

In a rabbit breeding farm, each rabbit lives in 1 cage. The rabbit population doubles every month. If it takes 48 months to fill all the cages in the farm, how long would it take to fill half of them?

months

If 3 elves can wrap 3 toys in 1 hour, how many elves are needed to wrap 6 toys in 2 hours?

elves

Jerry received both the 15th highest and the 15th lowest mark in the class. How many students are there in the class?

students

In an athletics team, tall members are three times more likely to win a medal than short members. This year the team has won 60 medals so far. How many of these have been won by short athletes?

medals

Next

5 Self-reported reflection

Survey

Honestly, did you carefully reflect upon the decision about how to allocate $0.60 between you and the other participant?

Please indicate your answer on a scale from 0 to 10, where 0 means "absolutely no" and a 10 means "absolutely yes"

absolutely no	○	○	○	○	○	○	○	○	○	○	○	absolutely yes
	0	1	2	3	4	5	6	7	8	9	10	

Next

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