
Influence of the unit of measurement on trust and reciprocity in a Trust Game.

Does trust behavior in a Trust Game differ depending on whether gains and losses are expressed in a unit or another ?

Research thesis project

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Abstract:

This research investigate whether trust and reciprocity behaviors in the Trust Game are influenced by the type of unit used to express outcomes (money or time) and by the framing of these outcomes as gains or losses. An online experimental questionnaire was deployed to evaluate participants' decisions across four different scenarios. The findings reveal a significant framing effect, with greater transfers under loss condition. Nonetheless, no significant difference was found between money and time, suggesting that the nature of the resource may have a limited impact on the behavior.

1 Introduction

Trust and reciprocity are omnipresent feelings for everyone, in everyday life. We base decision on it : entrust your keys to your neighbor to water your plants during the vacations (trust) and thank him by doing him a small service in return (reciprocity), lend money to a friend or telling a friend a secret and trusting them not to repeat it. Those are some example of who, where and when we practice trust and reciprocity in our own lifes. Thus from here, we can take a closer look at what motivates trust and reciprocity while numerous studies has focused on how trust and reciprocity in the Trust game including the effects of repeated interactions (Berg and al., 1995; Chaudhuri, Sopher and Strand, 2002), cultural differences (Buchan and al., 2002) and social norms other research has examined more specific factors, such as interactions with artificial agents like robots (Mota and al.), or the impact of participants playing both roles in the game (Burks and al.). Those studies demonstrate that both the structure and context of the game can significantly influence decision-making behavior.

However, less attention has been given to the influence of how game's outcomes are framed. One such framing element is the unit in which gains and losses are expressed -whether in monetary, non-monetary or abstract units-. What seems like a unimportant detail could in reality subtly shape how peoples perceive risks and values and thereby influencing their willingness to trust or to reciprocate.

This study investigate how trust and reciprocity will be influenced by the gain or loss framing and if this effect will be amplified when outcomes

are framed in money rather than non-monetary resources. This hypothesis is legitimate because the emotional dimension should be taken into account and how emotion, culture, norms, or rationality can condition behavior. It seems intuitive that individuals do not react the same way depending on whether rewards are expressed in real money, points, or abstract units. For example, a participant might behave more generously in a game when rewards are framed in “tokens” rather than euros, as the subjective perception of value and the sense of loss are reduced. This intuition is supported by the work of Rottenstreich and Hsee (2001), who showed that affectively charged units (such as a kiss or physical pain) are processed differently from monetary amounts, particularly under low-probability conditions. Can a simple change in framing -using tokens instead of euros for instance- affect the way individuals behave? By addressing this question, we aim to shed light on how cognitive and emotional responses to trust and reciprocity may depend not only on strategic and rational considerations or past experience but also on how the stakes are presented.

Berg, Dickhaut and McCabe[2] in 1995 designed “an experiment to study trust and reciprocity in an investment setting”. The Trust Game (or the investment game in the original version) was born. The trust game provides a controlled environment allowing us to isolate the effect of different types of units. By using it we can quantify behavior, measure the trust (amount sent) and reciprocity (amount returned). Moreover, the trust game is ideal for studying whether trust and reciprocity behavior change based on how

gains and losses are expressed. They based their game on usuals hypothesis of rationality and pure selfishness and for a deeper analyse, and for readers fond of formalized hypotheses, see the original article.

It is also important to keep in mind that with perfect information, the unique Nash equilibrium -a situation where no one has an incentive to deviate unilaterally- predicts that the trustor (the person who decides how much of their initial endowment to send to the other agent) should send nothing. According to standard economic theory, under the assumptions of full rationality and pure self-interest, the trustee (receives the multiplied amount from the experimenter and decides how much to return to the trustor) is expected to return nothing. Anticipating this, the trustor maximizes their own utility by keeping the entire endowment.

This theoretical prediction highlights the paradox of trust : although sending and returning money could increase the total payoff for both players, rational agents acting in their own interest. The gap between this theoretical outcome (€0) and actual behavior observed in experiments (individual sent in average €5.16) suggests that other factors such as social norms, fairness, or emotional considerations may be at play.

The procedure of the Trust Game is as follow :

1. **Two players** : a trustor (player A) and a trustee (player B).
2. **Initial endowment** : the trustor receives an initial amount of money (in the original game, they gaved €10).

3. **Trust decision** : the trustor decides how much of this amount to send to the trustee. The amount sent is tripled by the experimenter.
4. **Reciprocity decision** : the trustee receives the tripled amount and decides how much to return back to the trustor as a dictator game.
5. **Final payoff** : each player ends up with the amount they keep.

Berg and al. (1995) used a definition of trust similar to Coleman : for him, the trustor could or not "*place a trust*" in the trustee. And the trustee is said to "*keep the trust*," i.e., to reciprocate the degree of trust. Since the trustor's decision involves sending money with no guarantee of return, trust can be interpreted as a gamble based on *a priori* expectations of reciprocity rather than an explicit contract. In addition, the trustee's decision to reciprocate or not highlights social norms and fairness considerations. Insofar that a high level of reciprocity suggests inequality aversion or altruism, whereas a lack of it are in line with selfishness hypothesis. Thus, if trust is context-dependent this implies factor like unit framing, culture, background and so on may influence trustor and trustee behavior altering the standard predictions of the trust game.

The Trust Game is a well-known and well-used experience in economics behavior, some studies used it with different types of unit. To better situate my problematic in his scientific context, it is essential to review previous work on this subject.

In order to investigate the potential influence of unit framing on trust and reciprocity, this thesis is structured as follows. First, I will present

a review of the literature on the Trust Game and its various extensions, with particular attention to studies involving different types of units of measurement. Next, I will describe the experimental protocol developed to test my hypotheses, followed by the analysis of the collected data. Finally, we will discuss the results in light of the theoretical predictions and previous findings, and we will conclude with a discussion part with suggestion for the future research. Through this structure, we aim to better understand whether the way outcomes are framed can significantly shape trust-related behavior.

2 literature review

2.1 Extensions of the Trust Game

The paper from Ola Kvaløy and Miguel Luzuriaga (2012)[10] is based on a monetary resources but with the subtlety that they test if trustworthiness and reciprocity are affected when they imply no personal financial risks. This highlights a behavioral bias influenced by fund ownership and conclude that playing with other's money involve for participants to take more risks and show less reciprocity especially for women. The difference between owning or not the money is statistically significant at the Mann-Whitney test¹ at $p < 0.05$. If as in the article the perception of intention influence behaviors, we can hypothesize that change the unit of measurement for a gain or a loss can alter this perception. An abstract unit (tokens for instance) could as

¹used when the hypothesis of normal distribution for a t -test is not respected

others' money weaken the feeling of trust and reciprocity. By extension, we can briefly mention the work of Mónica Capra (2004)[5] about how mood influences strategic decisions behavior. This paper use different type of usual games : the dictator game, the ultimatum game and obviously the Trust Game. No statistically significant differences across mood treatments was found, at $\alpha = 0.10$ for the Trust Game. This study constitutes a contribution to my thesis insofar as it points out the importance of affective factors in trust and reciprocity behavior in strategic interactions. Although my work does not directly manipulate participants' mood, the influence tested by the study suggest that the framing used in my experience (the nature of the unit of measurement applied in a Trust Game whether monetary or not) can indirectly alter emotional state, values' perceptions and so strategic behavior of trust and reciprocity.

Marie Ritter and al. (2022)[16] tried to measure collective trust via an on-line adaptation of the original game relying on the HoneyComb paradigm^{2,3}. The collective trust game they set up is based on a succession of fifteen interactions using a non-monetary units : movements in a virtual environment with potential rewards to examine how trust is built collectively. Regarding the small size of the sample ($N = 16$), and the hypothesis that investments in the collective trust game change over time, they found no significant differences in terms of trust between the first, seventh and fifteenth round. This study is relevant to quote insofar that it interrogate on the way we struc-

²It provide an experimental paradigm to investigate human movement coordination, leadership, and other types of collective behavior

³Here is a more detailed explanation of the paradigm from JoVE : <https://youtu.be/6EDvmY35Q8Q?si=KPbLDxL0dYAWN-Eh>

ture games, and the experimental framing. By using a paradigm in which value is not expressed in monetary terms but via interactive decisions, the author demonstrates via another research paper[15] published in 2021 that *"the chosen reward structure of the game strongly affects the observed following behavior in the group"*, a finding that directly illustrates how significantly the form of a reward can influence both individual and group actions. This observation underscores the critical role of reward structure as a contextual factor that molds interactive behaviors within groups.

Those studies brings to light that trust varies according to the context : Kvaløy and Luzuriaga examined decisions with other's money, Capra explore the influence of emotions and Ritter and al. the collective dynamics behind trustworthiness. Each paper use a specific unit of measurement underlining a major issue of the Trust Game : compare results obtained with different approaches. We will now look at studies using less conventional units of measurement in other usuals games.

2.2 More units of measurement in usuals games

The choice of the units of measurement is crucial, depending on what you want to assess. A research from Yuval Rottenstreich and Christopher K. Hsee (2001)[17] where they first compared kisses and money, with a simple choice to make : choose between *"the opportunity to meet and kiss your favorite movie star or €50 in cash"*, either with certainty or low probability : *"They could take part in either a lottery offering a 1% chance of winning to meet and kiss their favorite movie star or a lottery offering 1% chance of winning €50*

in cash". In the certainty condition, 70% of participants preferred the cash over the kiss, but with low-probability, 65% preferred the kiss lottery rather than the cash lottery. They also compared a "*short, painful, but not dangerous electric shock*" and a financial penalty. Both was hypothetical. The conclusion is the following : under certainty, participants preferred receiving the shock over paying as a penalty more than €20 with a median at €19.86. In the low-probability case (a lottery with 1% to avoid chance of a shock) the risk perception shift : the median paid to avoid an electric shock was €7, against €1 to avoid an penalty of €20⁴. This result suggest that weak probabilities are overweighted for electric shock. This study highlights an asymmetry in risk perception depending on the nature of the penalization. Those results are in line with the hypothesis approving that the perception of a loss or a gain is influenced by emotions and so by the unit of measurement used.

Furthermore, Mohammed Abdellaoui and Emmanuel Kemel (2014)[1] tested prospect theory ("*probably the most descriptively valid model of decision under risk currently available*") in a context where outcomes were expressed in units of time. Participants takes decisions involving gains and losses of time instead of money and they compare their observations with classic monetary studies. With a paired *t*-test they found a *p*-value equal to 0.08 indicating that the difference in behavior between time and money is not statistically significant at the threshold 0.05. In contrast for losses, a difference in terms of goodness of fit for money were detected between time and money (*p* = 0.03) and argue, relying on Kemel and Travers (2013)[9] study claiming more

⁴with a statistic significance at $p < 0.05$ by the Mann-Whitney test

noisy observation for time than for money. One more time, those results corroborate the fact that the framing effect on the unit of measurement plays a key role on the perception of risked choices.

To conclude, an interesting research paper from Erkal, Gangadharanb, Han Koha(2018)[7] assessed the influence of monetary and non-monetary incentives in real-effort tournaments. Laboratory experiments involving real-effort tasks yield mixed results regarding the relationship between monetary incentives and effort provision. They done different experiences but only the first one interest us. It shows that participants provides a strong effort even without monetary incentives, revealing the importance of non-monetary ones, as competition, the pleasure, or the implicit experimenter's social pressure. This result gives us an important comprehension of incentives in the same way that effort did not depend solely on the value of earnings, trust could be influenced not by the objective value of the unit used, but by the subjective perception of the used unit.

3 Experimental protocol

3.1 Overview of the experiment

To investigate whether trust and reciprocity are influenced by the resources used to express gains and losses, we designed an adjusted version of the Trust Game implemented through an online questionnaire using Kobo-Collect and more specifically the Kobo Toolbox. It allows us to collect and structure data, to export answers easily in CSV/XLS or other formats, that is

useful for statistics analysis.

Participants were invited to take part in an online survey simulating a series of economic situations. Each participant might answer to an unique questionnaire, combining two axes : (1) the type of resources to be transferred (either money or time), and (2) the framing of the outcome (either framed as a potential gain or a potential loss). The questionnaire was fully anonymous and conducted online only to ensure accessibility and a diverse participant pool. The sampling method used was to distribute the questionnaire on Zimbra, the student webmail to guarantee a minimum of thirty observations to apply statistics analysis.

Regarding what the literature already claimed, we are entitled to ask ourselves if trust behavioral in a Trust Game differ depending on whether gains and losses are expressed in a unit or another. We will therefore pose several hypotheses that we will test.

- H_0 : Participants are more trusting meaning transfer more when it comes to money than when it comes to time.

Several studies support the idea that participants are more willing to trust when money is involved than when time is at stake. This difference stems from the way people perceive these two resources. Money is tangible, fungible, and recoverable. What is lost can potentially be earned back. Time, however, is rigid and irreversible.

Research by LeClerc, Schmitt, and Dube (1995)[11] shows that people are more risk-averse when facing potential losses of time than of money.

Similarly, Okada and Hoch (2004)[14] bring to light that time is perceived as more ambiguous and less fungible than money, leading individuals to treat it more cautiously. As a result, participants may be less inclined to invest or “trust” with time, making them more generous with money in trust-based decisions.

- H_1 : Participants will transfer more in a loss frame rather than a gain frame.

According to the prospect theory of Kahneman and Tversky (1979)[8], individuals are more sensitive to losses than to equivalent gains (i.e. risk-aversion). If a transfer avoids a loss, participants may be more inclined to transfer in order “not to lose”.

These two hypotheses can be crossed to explore how individuals behave when dealing with different resources (money vs. time) under varying framing effects (loss vs. gain). In a loss frame, individuals may be more inclined to transfer -consistent with H_1 - because they are trying to avoid a perceived loss. However, the nature of the resource modulates this tendency. Since time is perceived as less fungible and more precious than money, as highlighted in H_0 , participants might still hesitate to transfer time even in a loss frame. Conversely, with money the combination of higher trust and loss aversion could amplify the willingness to transfer. This suggests a possible interaction effect : the loss frame increases transfers overall, but more so when the resource at stake is money rather than time.

3.2 Structure of the questionnaire

The questionnaire was organized into several key sections designed to collect sociodemographic data, ensure participants' consent, and immerse participants in various situations.

3.2.1 Consent and instructions

Before entering the experimental part, participants were given a welcome message followed by a brief explanation of the study and asked to give their consent to the use of their responses and personal data. The instructions provided were voluntarily neutral to avoid any anchor or framing bias even before the experimental manipulations themselves.

3.2.2 Sociodemographic information

The next section gathered basic sociodemographic data. Participants were asked about their age, gender, student status (and if not their occupational categories), field and level of education, as well as the socio-professional category (SPC) of their parents. These variables serve as potential explanatory factors in understanding differences in trust behavior across groups.

3.2.3 Trust Game scenarios

The core of the questionnaire consisted of hypothetical trust game scenarios. Participants were placed in the role of "Individual A" and asked to imagine sending a certain amount of a resource (either money or time) to "Individual B". Since the amount sent would be tripled by the experimenter

before reaching individual B, participants were then asked to estimate how much individual B would send back in return. As mentioned earlier, they were four different situations (*Money Gain, Time Gain, Money Loss, Time Loss*). The structure across all situation was the same to avoid any framing effect. The goal was to assess both the participant's willingness to trust and their expectations regarding reciprocity.

To answer and for each scenarios, participants were asked to use a Likert scale from zero to ten for the first question i.e., where we asked how they want to send to individual B. No opened questions has been used. Then for the expected return of individual B, a unique choice question was asked for each decision that individual A could do i.e., for each send from one (and not zero even if zero was a choice for the first question because if individual A send zero, the game stop here) up to ten. For reference, the questionnaire used is available as attachment of this study.

3.3 Justification and limitation of the methodological choice

The use of a questionnaire-based approach was guided by both practical and theoretical considerations. In this study, the goal was to examine how individuals conceptualize trust and reciprocity when dealing with different types of resources and under different framing conditions, rather than to measure exact economic behavior under real monetary stakes. Using a questionnaire allowed us to include non-monetary stakes such as time which are difficult to implement in real-incentive experiments. It also enabled us to examine the participants' strategic behavior of expectations reciprocity

for all different cases (when individual A send one to ten units) providing richer data on trust threshold and reciprocity. Moreover, this study draws inspiration from Capra (2004), who emphasized the influence of mood on decision-making in strategic games. Although we did not manipulate emotional states directly, the use of abstract or non-monetary units in our framing could implicitly engage similar affective dimensions.

However, this approach also presents several limitations. The absence of real consequences can lead to hypothetical bias, where participants may not behave as they would in real life situations. Their answers might be influenced by idealism or social desirability rather than actual preferences under risk. Moreover, the lack of interactivity removes the emotional and strategic dimensions of real trust games, such as the fear of betrayal or the satisfaction of reciprocity. Even with clear instructions, some participants may oversimplify the task or fail to immerse themselves into the scenario, limiting the validity of the findings. It also important to keep in mind that the sample is not representative, and conclusion that can be drawn from this study are mainly limited to students from the Louis & Marie Pasteur University.

Despite these limitations, the questionnaire remains a valuable tool for isolating and testing the cognitive and perceptual mechanisms underlying trust and reciprocity, particularly when comparing abstract resources such as time and money.

4 Results

4.1 Descriptive statistics and general trends

The questionnaire was deployed the Sunday, July 15th 2025 to the Wednesday, July 20th 2025. A total of 46 individuals completed the questionnaire. However, 3 respondents explicitly declined to consent to the use of their data for research purposes. As a result, the final sample used for analysis consists of 43 valid observations.

The average age of the participants was 22.8 years, indicating that the sample primarily consists of young adults, which is consistent with the targeted student population. The gender distribution was nearly equal, with 21 male and 22 female participants, ensuring a balanced representation in terms of gender.

Regarding the socio-professional status, two respondents were not students. Among them, one identified as an "employee", while the other declared being part of the category "executives and intellectual professions". These two non-student participants provide an interesting external perspective but cannot be exploited due to the small number. The remaining 41 participants are all students, enrolled in a variety of academic disciplines. Specifically, 17 were studying law, 4 banking and finance, 13 economics, 5 public policy, 1 computer science, and 1 water-related studies. This distribution reflects a relatively diverse academic background, though with a predominance of students in the legal and economic fields, which may influence their interpretation of the scenarios presented in the questionnaire.

Using Excel pivot tables, the analysis reveals consistent and meaningful differences in participants' decisions based on their father's socio-professional category (SPC). Across all four scenarios (*Money Gain*, *Time Gain*, *Money Loss*, and *Time Loss*) participants whose fathers are artisans, shopkeepers, or business owners consistently scored the highest, suggesting a strong pattern of generosity or trust. The number of participants in each category is detailed in Table 1.

Father's socio-professional category (SPC)	Number of Observations (N)
Artisans, shopkeepers and business owners	5
Employees	5
Other (e.g. retired, deceased, on leave)	6
Executives and higher intellectual professions	17
Skilled workers	7
Intermediate professions	3

Table 1: Number of participants by father's SPC

For the *Money Gain* question (the variable Q_GA), children of artisans sent the most money on average (€7.80), followed by those whose fathers are employees (€5.00), "other" category participants (€4.80), executives and higher intellectual professions (€4.20), skilled workers (€3.60), and finally intermediate professions (€2.70).

In *Time Gain* (the variable Q_GT), a similar ranking appears. Artisans again top the list (€8.00), followed by the "other" category (€6.83), executives and higher intellectual professions (€3.80), skilled workers (€3.10), intermediate professions (€2.30), and employees (€1.40).

For both *Money Loss* (the variable Q_PA) and *Time Loss* (the variable

Q.PT), the ranking of SPCs is identical. Participants with artisan fathers scored the highest (€6.00), followed by intermediate professions (€4.70), skilled workers (€4.00), executives (€2.20), “other” (€0.50), and employees (€0.00).

These results are detailed in Table 2 and show a clear and repeated trend : participants whose fathers are artisans systematically express higher levels of trust or willingness to give across all scenarios. Conversely, participants from employee backgrounds consistently rank the lowest except for the *Money Gain* scenario. The repeated hierarchy between scenarios *Money Loss* and *Time Loss* might supports the idea that certain socio-familial contexts shape participants’ cooperative or cautious behavior in structured economic interactions but nothing can be affirmed.

Father’s SPC	MG	TG	ML	TL
Craftsmen, shopkeepers and business owners	7.8	8.0	6.0	6.0
Other	4.8	6.8	0.5	1.0
Executives and higher intellectual professions	4.2	3.8	2.2	2.2
Employees	5	1.4	0.0	0.0
Skilled workers	3.6	3.1	3.6	2.7
Intermediate professions	2.7	2.3	4.7	4.7
Mean for each scenarios	4.6	4.2	2.5	2.5

MG : Money Gain, TG : Time Gain, ML : Money Loss, TL : Time Loss

Table 2: Average responses to each scenario based on the father’s socio-professional category

Table 3 presents the average strategic behavior of participants according to the amount considered in the game, across four different scenarios : *Money Gain* (MG), *Time Gain* (TG), *Money Loss* (ML), and *Time Loss* (TL). The data

reveal a consistent increase across all four scenarios as the amount progresses from 1 to 10, indicating a proportional strategic behavior of participants.

In the gain-related scenarios, both *Money Gain* and *Time Gain* increase steadily. Responses in the *Time Gain* condition are slightly higher on average than those in the *Money Gain* situation, suggesting that participants may attribute greater value to time benefits than to monetary ones in a cooperative setting.

In the loss-related scenarios, the increases are sharper. Both *Money Loss* and *Time Loss* values rise rapidly with the amount, and they consistently exceed the corresponding gain conditions. Additionally, values for *Time Loss* tend to be marginally higher than for *Money Loss* across all levels.

These results suggest that participants exhibit stronger strategic reactions when facing potential losses than potential gains, consistent with behavioral economic theories on loss aversion and corroborating the H_1 hypothesis. Moreover, time-related stakes -whether gains or losses- appear to carry slightly more psychological weight than monetary ones, hinting at a differentiated sensitivity depending on the type of resource at risk. We can also echo the fact that participants from artisan backgrounds tended to show greater generosity across conditions might indirectly reflect what Kvaløy and Luzuriaga (2012) identified : decisions can vary significantly when the perceived ownership of the resource changes. It is plausible that family economic culture influences the way resources like money or time are valued and used in trust-based interactions.

Amount	MG	TG	ML	TL
1	0.977	1.000	2.163	2.233
2	2.023	2.000	4.372	4.605
3	2.884	3.047	6.512	7.023
4	3.930	4.140	8.721	9.279
5	4.884	5.116	10.930	11.512
6	5.558	5.791	12.558	13.070
7	6.465	6.302	13.884	14.395
8	8.581	9.047	18.093	18.581
9	9.535	9.791	20.163	20.907
10	10.791	10.395	22.442	23.186

Table 3: Mean of the strategic behavior for each amount (line) and each scenario (column)

4.2 Hypothesis testing and inferential statistics

This section presents the methods and results of hypothesis testing and inferential statistics applied to the collected data. The goal of this analysis is to determine whether observed differences or relationships among variables are statistically significant, allowing for valid conclusions beyond descriptive summaries. The main focus is on evaluating key variables related to the study objectives using appropriate statistical procedures.

Normality tests were performed using the Shapiro-Wilk test for all variables. Specifically, the main variables Q_GA , Q_GT , Q_PA , and Q_PT (how much individual A would send to individual B) were tested, as well as the variables QQ_GA1 through QQ_GA10 , QQ_GT1 through QQ_GT10 , QQ_PA1 through QQ_PA10 , and QQ_PT1 through QQ_PT10 (how much individual A expects individual B will return, regarding how much individual A sent).

The normality test of the data distributions was not conclusive for any of the variables (see Table 4 for the main variables). Therefore, the assumptions required for applying the Student's t -test are not met. This lack of normality may be due to skewed data, the presence of outliers, or the limited sample size. As the assumption of normality is a key requirement for the validity of parametric tests such as the Student's t -test, these tests could not be reliably applied. Consequently, the Mann-Whitney test was used instead to assess the statistical significance of the variable coefficients.

Variable	W Statistic	p-value	Normality
Q_GA	0.86912	0.00016	Not normal
Q_GT	0.86019	9.524e-05	Not normal
Q_PA	0.63284	3.915e-09	Not normal
Q_PT	0.63678	4.481e-09	Not normal

Table 4: Shapiro-Wilk normality test results for main variables

For testing the H_0 hypothesis (participants transfer more when it comes to money than when it comes to time), I do a Mann-Whitney test with Q_GA and Q_GT and another test with Q_PA and Q_PT .

Based on the results of the Mann-Whitney tests, I do not find sufficient evidence to support the hypothesis that participants are more trusting (i.e., transfer more) in the money condition than in the time condition. Both p -values obtained from the tests comparing Q_GA with Q_GT (p -value = 0.4342) and Q_PA with Q_PT (p -value = 0.8581) are well above the conven-

tional significance level of 0.05. Therefore, I fail to reject the null hypothesis (there is no significant difference between the mean of the two variables) in both cases, indicating that the type of resource (money vs. time) does not significantly affect the amount transferred by participants.

To test the hypothesis H_1 of my study (participants transfer more in a loss frame than in a gain frame), I conducted Mann-Whitney tests on both the money and time conditions. The first test compared Q_GA and Q_PA , and yielded a p -value of 0.01154, which is below the 0.05 significance threshold. The second test compared Q_GT and Q_PT , and returned a p -value of 0.03058, also below 0.05.

These results indicate that, in both domains, participants transferred significantly more in the loss frame than in the gain frame. Therefore, I reject the null hypothesis and conclude that the framing effect (gain vs. loss) has a significant impact on participant behavior *ceteris paribus*.

4.2.1 Extra : Linear regression analysis

This sub-section allows us to exploit the data collected on the strategic behavior of individual A for each possible situation in each scenario. To analyze the evolution of participants' responses across repeated decisions, linear regressions were performed separately on four series of variables : QQ_GA , QQ_GT , QQ_PA , and QQ_PT . Each series includes ten variables, representing decisions made in response to an increase in the amount sent by individual A. For each series, I computed the mean response at each point

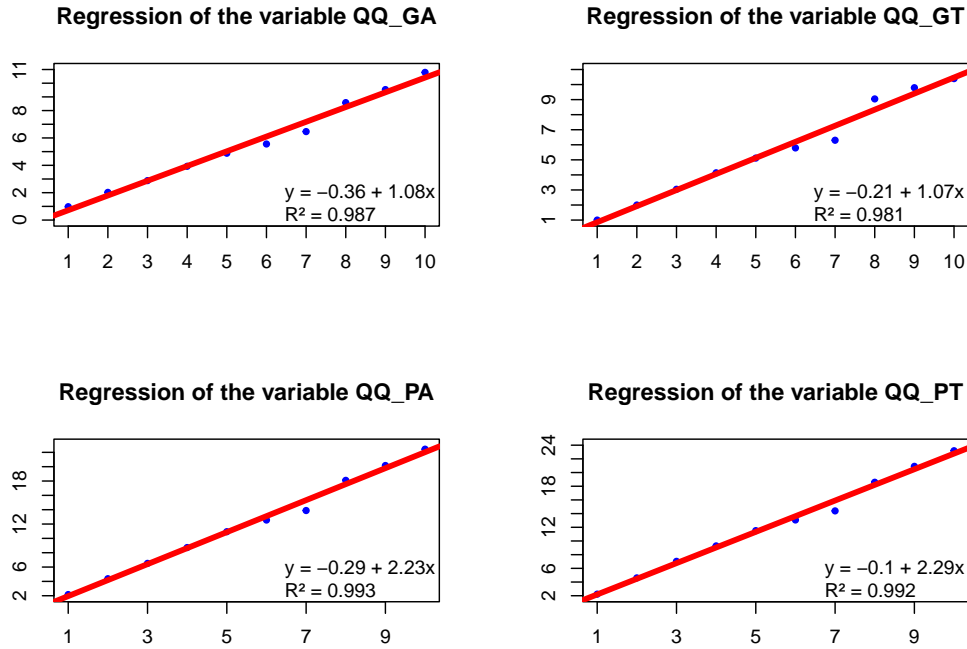
and regressed it on. See the Figure 1.

The results reveal strong linear patterns. For both *QQ_GA* and *QQ_GT*, the estimated slopes (respectively 1.08 and 1.07) indicate a steady increase in the average response as the amount sent increases. This suggests that participants became increasingly generous or cooperative. In contrast, the *QQ_PA* and *QQ_PT* series show much steeper slopes (around 2.23 and 2.29), reflecting a stronger increase in contributions or returns. The coefficients of determination (R^2) are all above 0.98, confirming that the linear model explains the vast majority of the variance.

These results suggest that the decision patterns follow a highly regular and predictable progression, likely influenced by the structure or framing of the tasks.

5 Discussion and conclusion

On one hand, the results of this study offer a nuanced view of how trust and reciprocity are shaped in strategic contexts. Notably, the significant effect of loss framing supports the predictions of prospect theory (Kahneman & Tversky, 1979), reinforcing the idea that individuals are more motivated to avoid losses than to win equivalent gains. This was consistent across both monetary and temporal conditions, suggesting a robust psychological bias toward loss aversion.



the x axis : The amount sent by A

the y axis : The amount anticipated by A from the amount sent by B

Figure 1: Regressions of anticipated returns (by A) as a function of amounts sent, for each experimental scenario

On the other hand, the absence of significant differences between money and time conditions challenges a common assumption found in the literature : that time, being irreversible and non-fungible, would lead individuals to act more cautiously or trust less. Contrary to prior findings (LeClerc et al., 1995; Okada & Hoch, 2004), this result implies that, at least in hypothetical settings, participants do not clearly distinguish between time and money when evaluating trust-based interactions.

These results highlight the power of framing effects. Nonetheless it's plausible that the lack of real stakes in this study -since it relied on a ques-

tionnaire without material consequences- may have diluted the perceived value differences between time and money.

The socio-professional background of participants also revealed suggestive patterns, particularly the consistently higher levels of trust among children of artisans or small business owners. While these trends are not statistically confirmed due to sample size, they raise interesting hypotheses about cultural or familial transmission of economic values.

To conclude, this study sought to understand whether the unit used to express gains and losses in a Trust Game influences trust behavior. The findings reveal that framing effects significantly impact participants' willingness to trust : individuals tend to transfer more when scenarios are framed as losses rather than gains. This result aligns with established theories in behavioral economics and reinforces the cognitive sensitivity to losses.

However, the nature of the resource -money vs. time- did not significantly influence behavior. This suggests that, contrary to some theoretical expectations, the perceived fungibility or the perceived value of the resource may not be as influential in hypothetical decision-making contexts.

While the study offers valuable insights, its limitations (particularly the use of hypothetical scenarios and a non-representative sample) temper the generalizability of the results. Future research could build on this work by using incentivized experiments, larger and more diverse samples, and alternative non-monetary units to explore deeper how framing and resource types interact in trust and reciprocity dynamics.

Overall, our findings align with previous research that emphasizes the importance of context and framing in trust-related decisions (e.g., Capra, Rottenstreich & Hsee, Ritter et al.). Although we did not reproduce their exact protocols, our variations contribute to the growing literature questioning the neutrality of units and the psychological effects of decision framing.

6 Appendix

- **Table 1** : Number of participants by father's SPC(see page 18).
- **Table 2** : Average responses to each scenario based on the father's SPC(see page 19).
- **Table 3** : Mean of the strategic behavior for each amount (line) and each scenario (column) (see page 21).
- **Table 4** : Shapiro-Wilk normality test results for main variables(see page 22).
- **Image 1** : Regressions of anticipated returns (by A) as a function of amounts sent, for each experimental scenario (see page 25).

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