Avlok Gupta (2018111017)
Adityakumar Sinha (2019102003)

Introduction to Neuroeconomics
PROJECT REPORT

Repository for Data Analysis and Hypotheses testing

Abstract

We wanted to analyse the function of shame in decision-making in risky settings. In the paper, it is shown how socio-moral sentiments and the expected sensation of shame or guilt associated with various possibilities can influence our selections, even overriding the certainty effect's cognitive choice tendency. In order to do so, we replicated the study with volunteers of an age group consisting mostly of university students, splitting them into four experimental groups. Our findings indicate that people avoid making immoral actions, both when they are made public and when they are kept private, in order to avoid violating internal moral code. This finding suggests that transparency is less important than previously thought. However, we argue that, while openness has

a modest influence on reducing unethical economic decisions, it should still be considered in theoretical models that explain why individuals act unethically.

Introduction

The field of risky decision-making is dominated by mainly two theories: Expected Utility Theory [1] and Prospect Theory [2]. According to Expected Utility Theory, people rationally pick those outcomes that provide more expected benefit. In Prospect Theory, decisions are based on a point of reference or status quo, with better results deemed gains and negative results considered losses [3]. Risk aversion for high probability gains, risk seeking for high probability losses, risk seeking for low probability gains, and risk aversion for low probability losses are all proposed in this theory [4]. Prospect Theory brings about a critical shift in the understanding of decision-making, which had previously been characterised using rational choice models. However, under some circumstances, its theoretical framework is insufficient to explain some emotional judgments. This research will emphasise the need for a new theoretical model that takes into account the function of socio-moral emotions in decision-making, as well as the need of identifying the diverse effects of distinct socio-moral emotions on risky decision-making. The relevance of the expected feeling of shame will be addressed in particular, as this socio-moral emotion has gotten less attention in the scientific literature [5]. As a result, the research will illustrate how and to what degree the expected sensation of shame might diminish the occurrence of moral transgression-related economic decisions. We believe that explaining this method will aid in clarifying the impact of transparency measures on unethical behaviour.

The socio-moral emotion of shame

Shame is a self-aware, socio-moral feeling that entails a negative overall assessment of oneself [6–8]. Its presence necessitates the development of specific cognitive capacities that allow for a clear distinction between oneself and others, as well as the development of some rules or norms regarding what is good and wrong [9].

The Sociometer Theory

The "Sociometer Theory" [10-12] is one of the most prominent ideas on how shame might change conduct. Because they are sensitive to being or not being accepted by others, people have a strong drive to maintain at least a few interpersonal ties, according to this hypothesis. People use a "sociometer" to assess how they are seen by others, and they are concerned about not conveying improper perceptions that jeopardise their social inclusion. They do so in order to avoid a possible

devaluation of their interpersonal relationships, which might have both physical and psychological effects [13]. Furthermore, socio-moral feelings such as shame have been claimed to inspire people to act ethically.

Objective and Hypotheses

The major goal of this research is to see if there is a reduction in immoral decisions when they are made public vs when they are kept private, while trying to replicate the original study on a different demographic. Furthermore, the results we'll obtain might be an indication that emotional charge included in the alternatives is capable of nullifying the certainty effect predicted by the Prospect Theory. In a hypothetical scenario of profit, we intend to show that aversion to the immoral alternative is more potent than aversion to risk, highlighting the importance of valuing emotional components in risk decision-making. So, following hypotheses have been proposed:

-> H1: People will choose for certain gains (regardless of whether they are ethical or not) when making private judgements.

-> H2: People are less likely to make immoral choices (regardless of whether they involve a probable or sure gain) when their decisions are made public.

-> H3: When decisions are made in public, unethical options are less likely to be chosen than when they are made privately (regardless of whether they involve a probable or sure gain).

Methodology

Participants

We had a total of 86 participants, mostly college students of different fields such as engineering, medical, commerce, arts etc, ranging in age from 18 to 29. In terms of gender, there were 60 men (70%), and 26 women in the sample (30%). Four experimental conditions were used in the study: 17 people in condition 1, 14 people in condition 2, 23 people in condition 3, and 28 in condition 4, where the people were randomly allocated to these different conditions. The experiment was conducted online and hosted on psytoolkit. Click here for the survey.

Design of the experiment

We have followed the same design that is followed in the original study. In one of the options presented, an implicit emotional value was inserted, notably in the alternative that entails gaining a

certain amount of money through immoral action (accepting the gain from a scholarship that has been granted to you by mistake). The other option offers that you gain a set amount of money by engaging in ethical action that has no emotional value. We chose becoming a part-time teacher for an online teaching platform as an ethical choice as here the person would just be distributing the knowledge he/she has.

In conditions 1 and 3 of our experiment, the unethical option corresponded to alternative (a) or certain gain, whereas the neutral decision corresponded to alternative (b) or likely gain. The neutral option was chosen to correspond with alternative (a) or sure gain, and the unethical decision with alternative (b) or likely gain in conditions 2 and 4.

The following text was used in the private situation (conditions 1 and 2): “Please, imagine that you have to choose between the two options offered below. Taking into account that your decision never will be known by anyone, mark your choice:” The following alternatives were offered depending on the condition:

Condition 1:

a) A sure win of Rs. 25000 from a scholarship that doesn't correspond to you and was granted to you by mistake.
b) An 80% chance of winning Rs. 35000 by teaching content from previous courses for an online teaching platform, and the remaining 20% of not winning anything because of not being able to get hired or find students.

Condition 2:

a) A sure win of Rs. 25000 by teaching content from previous courses for an online teaching platform.
b) An 80% chance of winning Rs. 35000 from a scholarship that doesn't correspond to you and was granted to you by mistake, and the remaining 20% of not winning anything because the concerned authorities finally find out and correct the mistake.

In the situation where the decisions are made public, the following text was offered: “Please, imagine that you have to choose between the two options offered below. Taking into account that your decision will be made public and known by everyone, mark your choice:” Again, the following alternatives were proposed depending on the condition:

Condition 3:

a) A sure win of Rs. 25000 from a scholarship that doesn't correspond to you and was granted to you by mistake.
b) An 80% chance of winning Rs. 35000 by teaching content from previous courses for an online teaching platform, and the remaining 20% of not winning anything because of not being able to get hired or find students.

Condition 4:

a) A sure win of Rs. 25000 by teaching content from previous courses for an online teaching platform.
b) An 80% chance of winning Rs. 35000 from a scholarship that doesn't correspond to you and was granted to you by mistake, and the remaining 20% of not winning anything because the concerned authorities finally find out and correct the mistake.

The four experimental conditions were randomly allocated to different participants in the experiment. Each participant received a copy of one of the four variants of the above-mentioned decision-making issue. Participants were advised that after carefully reading the statement, they should pick one of the options (or not answer at all, leaving the form blank if they did not wish to participate in the study), and that there were no correct or incorrect answers.

Data Analysis

After measuring the frequency of the participants' preferred options, we conducted the binomial and chi-squared tests to confirm our hypotheses. To determine if the choices picked in each experimental condition differed significantly, the binomial tests were conducted, using a p-value of 0.5. To carry out the proportion contrasts that would allow us to compare the percentages between different experimental circumstances, we employed chi-squared tests. These tests might tell if there were statistically significant variations between conditions 1 and 2 (H1: private situation), 3 and 4 (H2: public situation), 1 and 3 and 2 and 4 (H3: interaction effects), and the percentages of choices in public and private situations (H3: main effects).

Results and discussions

	Conditions	Option 1	Option 2
0	Condition 1	5	12
1	Condition 2	12	2
2	Condition 3	9	14
3	Condition 4	25	3

These were the responses that we got. Here, options and conditions are as described above.

Private Situation

Conditions	Option 1	Option 2
Condition 1	5	12
Condition 2	12	2

Here, option 1 and option 2 correspond to sure gain and probable gain, respectively. From the responses we got it is evident that the participants, in condition 1 chose the option with probable (but ethical) gain to a higher degree, and in condition 2, chose the option with sure(and ethical) gain to a much greater extent. This tells us that participants preferred the option linked to ethical gain over unethical gain even in the situation where they were told their responses will be kept private. The chi-squared test revealed that there are statistically significant differences in the responses from condition 1 and condition 2 (stat = 7.68, $p < 0.01$). This contradicts our first hypotheses and tells us that the effect of socio-moral influence and inner moral constructs is greater than the certainty effect proposed by the prospect theory. When performing a binomial test, we obtained that the certainty effect was totally inverted in condition 2($p \sim 0.01$), but only suppressed in condition 1($p>0.05$).

Public Situation

Conditions	Option 1	Option 2
Condition 3	9	14
Condition 4	25	3

Here, option 1 and option 2 correspond to sure gain and probable gain, respectively. Again, as in private situations, we can see that people preferred the ethical choice regardless of it being a probable gain(condition 3) or sure gain(condition 4). The results suggest that there were statistical differences between conditions 3 and 4 (stat= 12.12, $p < 0.01$). This aligns with our second hypothesis that people preferred to choose the ethical option and avoided unethical choices with the anticipated emotions of shame. Both condition 3 ($p< 0.01$) and condition 4 ($p<0.01$) had significant differences according to the binomial tests. The distinction between the two is that in both cases, the immoral decision is avoided.

Public vs Private

Type	Non-Ethical	Ethical
Private	7	24
Public	12	39

From the data we collected, it is evident that people chose ethical choices in both private and public situations with the percentage of ethical choices in private situations ~ percentage of ethical choices in public situations. This is verified by the chi-squared test which showed that there were not many significant differences in both the results (stat=0.029, $p > 0.05$).

Conclusions

Our first hypothesis(H1) in the situation where the decisions remain private is not supported by the responses that we got, just like the original study. Even in the private scenarios people preferred to avoid the unethical choices which tells us that people are more averse to socio-moral emotional charge than risk. We can say that people associate lesser values to sure gains obtained through unethical means even though economic values were equivalent for all alternatives.

Our second hypothesis(H2) for the situation where the decisions were made public is confirmed by the responses that we got, again in alignment with the original study. Here, the anticipated feelings of shame and the lesser value associated with the sure but unethical gains justify the results that we got. We can say that people tend to avoid situations which can cause feelings of embarrassment and stay in line with the moral construct. Consequently, although there have been studies that demonstrate that being in a mental state of guilt is associated with aversion to risk [14], expected emotions of shame lead to avoidance of any choice that causes this emotional state, whether or not it is risky.

Now, for our third hypothesis we have mixed results, half of which supports the hypothesis and half of which does not, which again agrees with the results obtained in the original study. This is somewhat expected after making sense of results obtained from H1 and H2. In conditions 2 and 4, the participants are doubly inclined towards picking the ethical choice because of being averse to socio-moral emotional charge and risk both. This is why we get overwhelmingly ethical responses in these two conditions. In conditions 1 and 3, there was given a trade-off in terms of emotionally charged and sure but unethical gain. This tells us that transparency is a secondary factor that plays a role in a person's decision making as there were no significant differences among the unethical choices picked in both the conditions and people tend to listen to the internal moral standards.

Limitations

The study solely considers the consequences of the shame feeling and the function of transparency in hypothetical gain situations. There is a possibility that if experiments are performed with hypothetical loss scenarios we might have yielded different results where the role of transparency in decision making might have been larger than what is been shown by this study. So future experiments must be performed by establishing different functions of value covering different criterias to obtain better understanding of how the emotion of shame plays a role in economic decision making.

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