WORKING PAPERS

Castellón
(Spain)

UNIVERSITAT
JAUME I

Gender identification and stake size effects in the Impunity Game

Economics Department

Anabel Doñate-Buendía
Hernán Bejarano
Aurora García-Gallego

2022 / 08

Gender identification and stake size effects in the Impunity Game

Anabel Doñate-Buendía
Universitat Jaume I
LEE & Department of Economics
donatea@uji.es

Hernán Bejarano
Centro de Investigación y Docencia Económicas
Economics Division
hbejainpenn@gmail.com

Aurora García-Gallego
Universitat Jaume I & UCM
ICAE & LEE & Department of Economics
mgarcia@uji.es

2022 / 08

Abstract

In the impunity game, responders, unlike the ultimatum game, cannot affect proposer's outcomes. Proposers in this game, like in the dictator game, have full control over their own outcome, as rejection from the responder has no effect on their payoff. Thus, the theoretical prediction of this game states that the responder should accept any offer. An experiment is designed aiming at analysing both players' behaviour in the impunity game when subjects are aware of the gender of their partner. Additionally, we examine the effect of different stake sizes. An online experiment with eight different treatments is implemented, with a total number of 1,210 observations. The main findings are that proposers give to responders an important (around 35%) share on average, and that both the stake size and gender identification affect their decisions. Moreover, responders' rejection patterns follow the game theoretical prediction, although the hypothesis that knowing your counterpart sex/gender affects responders' behaviour cannot be rejected. Finally, subjects' behaviour in this game is found to be determined by their personality and psychopathy traits, as well as by their emotional intelligence level. Other sociodemographic characteristics like place of birth or their employment status are found to also influence their decisions.

Gender identification and stake size effects in the Impunity Game

Anabel Doñate-Buendía[1a], Hernán Bejarano[2], Aurora García-Gallego[1,3]

[1]*Laboratorio de Economía Experimental (LEE) and Economics Department, Universitat Jaume I, Castellón, Spain*

[2] *CIDE- Centro de Investigación y Docencia Económicas A.C, Ciudad de México, México*

[3] *ICAE and Economics Dept., Universidad Complutense de Madrid, Madrid, Spain*

ORCID: 0000-0001-9831-3774 (Anabel Doñate-Buendía); 0000-0002-9897-5425 (Hernan Bejarano); 0000-0002-4698-563X (Aurora García-Gallego)

[a]Corresponding author: donatea@uji.es (A. Doñate-Buendía)

Abstract

In the impunity game, responders, unlike the ultimatum game, cannot affect proposer's outcomes. Proposers in this game, like in the dictator game, have full control over their own outcome, as rejection from the responder has no effect on their payoff. Thus, the theoretical prediction of this game states that the responder should accept any offer. An experiment is designed aiming at analysing both players' behaviour in the impunity game when subjects are aware of the gender of their partner. Additionally, we examine the effect of different stake sizes. An online experiment with eight different treatments is implemented, with a total number of 1,210 observations. The main findings are that proposers give to responders an important (around 35%) share on average, and that both the stake size and gender identification affect their decisions. Moreover, responders' rejection patterns follow the game theoretical prediction, although the hypothesis that knowing your counterpart sex/gender affects responders' behaviour cannot be rejected. Finally, subjects' behaviour in this game is found to be determined by their personality and psychopathy traits, as well as by their emotional intelligence level. Other sociodemographic characteristics like place of birth or their employment status are found to also influence their decisions.

Keywords: impunity game; experiment; gender identification; stake size

JEL Classification: C90, C88, D63, D64, D91

1. Introduction

The impunity game (IG henceforth) shows similar design characteristics to both the dictator and the ultimatum game. In this game, a proposer offers a division of money, and a responder decides whether to accept or reject the offer. If the offer is accepted, the proposer and the responder receive the amount specified in the proposal. If the offer is rejected, the responder earns nothing, and the proposer keeps the money he designated for himself. Therefore, a rejection in this game exacerbates rather than reduces inequality.

In the theoretical prediction of this game the responder should accept any offer. In fact, rejection rates should be reduced since a social preference for inequity aversion cannot explain responders' rejection. Instead, rejecting an offer in the IG shows the importance of the role of emotions. In particular, it might be a tool to symbolically punish the proposer's unfair behaviour, communicating anger or moral disgust, without taking into account the consequences of their choice (Yamagishi et al., 2009).

Previous studies using this game have found that subjects importantly reject unfair offers, thus renouncing to their own benefit, and despite responders cannot punish the proposer by affecting his outcome through their decision (Yamagishi et al., 2009; Takagishi et al., 2009; Balafoutas & Jaber-Lopez, 2018).

Despite this interesting finding, the game has not been further exploited. Additionally, previous studies have mainly focused on responders' behaviour. We propose an experiment that examines the decisions of both proposers and responders, aiming at analysing some possible determinants of subjects' behaviour, such as gender identification or the stake size. Our data shows proposers sharing, on average, around 35% of the endowment and responders mainly accepting any offer received. Moreover, the stake size as well as gender identification seem to affect proposers' decision-making.

At last, some sociodemographic characteristics, personality and psychopathy traits are identified as drivers of behaviour.

The remaining of the paper is organised as follows. Section 2 includes the design of the experiment. Section 3 presents the main results found. In section 4 the discussion and conclusions are presented. Two appendices at the end include tables with details on the econometric analysis performed and the translated instructions.

2. Experimental design

2.1. Procedures and participants

An online[1] experiment (using the software Qualtrics) was implemented. The recruitment process for subjects was made through ORSEE, for the database from the Laboratorio de Economía Experimental (LEE) at Universitat Jaume I (UJI) in Castellón (Spain). Hence, the participants in our experiment were all recruited from the laboratory subjects' pool, providing us with a large and very rich sample.

The experiment was launched on April the 29th, 2020. A total of 2,983 subjects received the invitation to participate, getting finally a total of 1,599 observations. After a cleaning of the data, 24.3% were rejected[2], so that 1,210 observations remained; 714 (59%) of the participants were women, and 496 (41%) were men.

---

[1] Apart from the fact that Spain was under the COVID lockdown, running this experiment online gave us the possibility to clean any biases that could affect the decisions. For example, avoiding factors that could interact with subjects' decision making processes while being all in the same room, some of them knowing each other, or just seen each other before entering the lab.

[2] The first reason for exclusion was the response time; we rejected the observations below 9 minutes and those above 60 minutes. The second exclusion motive was the inconsistencies on the risk aversion test responses, so that all cases in which subjects moved randomly from A to B choices were rejected, as they surely had problems in understanding the instructions.

As regards monetary incentives, subjects participated in a draw of 30 awards of 50€ each, so that each participant had the same probability of getting the reward. The winners received their payment online, directly on their bank account, after signing an agreement form. Voslinsky & Azar (2021) in their literature review discuss the convenience of paying only a subset of participants, instead of all of them. The authors conclude that the selection of a subset of subjects to be paid a high prize, as it is our case, leads to an increase in response rates, a minimisation of transaction costs, the possibility of managing a limited budget, the same consideration about choices and the same degree of effectiveness as when paying the entire sample.

2.2. *The experiment*

The experiment has eight different treatments, in all of them participants play the IG but their role, the stake and the sex of the opponent varies across treatments. The characteristics of each treatment are described in Table 1. The aim of this experiment is to test both generosity and rejection patterns for different stake sizes (5€ vs. 10€), as well as for different partner's gender. Thus, the control variables used are: the role played by the subject, the stake size, and the gender of the partner.

[Table 1 here]

In treatments T1 to T4 subjects play the role of proposer and they have to choose how much to give to the responder from 0 to 5 (or 10) in increments of 1€. Proposers are aware of the gender of the responder when making their decision.

In treatments T5 to T8, subjects play the role of responder and have to decide whether to accept the amount given by the proposer. They know that if they accept, both players receive the specified amount, and if they reject, they get nothing, but the proposer keeps the amount initially proposed. Responders are aware of the gender of their counterpart,

4

the proposer, when making their decision. In these treatments, the share is fixed, that is, the offers are equal to 20% of the total amount for the responders. In the treatments in which the endowment is 5€, the distribution is 4€-1€, and in the treatments with endowment equal to 10€, the money distribution is 8€-2€. Responders get this information before making their decision.

In these treatments, after making the decision, the strategy method is implemented so as to elicit the preferences of the responders for each possible distribution of the total amount.

The distribution of subjects over treatments shows that there are around 150 observations in each one, with a total of 1,210.

Each subject only participates in one randomly chosen treatment. There is no real matching; hence, subjects are encouraged to imagine they are actually in a real situation and with a real player as the one described.

Additionally, this experiment controls for subjects' personality traits through the Big Five Inventory (Benet-Martínez & John, 1998), so as to check the influence of different levels of extroversion, neuroticism, agreeableness, conscientiousness and openness on subjects' decision making. Their emotional intelligence level is also measured with the scale developed by Hall et al. (1998), this dimension is taken into account as higher levels of emotional intelligence have been linked to prosocial behaviour. Finally, the importance of subjects' risk aversion and psychopathy traits is accounted for through the Holt and Laury lottery test (Holt & Laury, 2002), and the Levenson psychopathy scale (Levenson et al., 1995; Rodríguez et al., 2018).

Finally, information about some sociodemographic characteristics that can be relevant to explain subjects' behaviour is collected: the gender of subjects, their age and country

of origin, whether they have children or not, their level of education, their employment status, and their working sector. We are interested in gender as there might be some effect of pairing; that is to say, differences on behaviour when comparing a man with a man, a woman with a woman, and man-woman and woman-man pairs. Some effects in this line have been shown in previous studies on dictator and ultimatum games (Ben-Ner et al., 2004; Eckel & Grossman, 2001). Age and country of origin of subjects are collected to test for the effect of maturity and/or place of birth on subjects' decision-making. Additionally, subjects are asked whether they have children or not, and if they do, how many in total and how many of them are girls or boys; we speculate that having children affects decisions that are related with generosity and related aspects of personality. With respect to the employment status, we ask whether they are employed, unemployed, and/or they are students; in the case they are employed, the corresponding productive sector is also requested. Data on the level of education (primary, secondary or tertiary), is also collected. We want to check for any differences among the diverse groups.

The survey was shared via ORSEE to the participants' database of the Laboratorio de Economía Experimental (LEE). Subjects received an e-mail with all the instructions and the direct link to the survey.

2.3. Testable hypotheses

Previous studies on the IG have mainly focused on responders' behaviour in front of unfair offers, finding high rejection patterns, which are inconsistent with the game-theoretical predictions. In this paper, the aim is to analyse some possible determinants of both proposers and responders' decisions. Through the eight treatments designed, the effects of varying the size of the stakes, as well as of identifying the gender of the opponent are examined. In all treatments, we control for subjects' personality and

psychopathy traits, emotional intelligence levels, risk preferences and some sociodemographic characteristics. Two hypotheses for each type of player are in place:

H1.1. - In the IG, average shares by proposers will be lower for higher stakes.

A meta-analysis on similar games, namely the dictator and the ultimatum game, shows that increasing the size of the stake has a small but negative effect on offers (Larney et al., 2019). Additionally, previous studies on the IG find that proposers play according to equilibrium (Bolton et al., 1998, p.270). Given that subjects are naturally selfish, we believe that they will try to keep more the more they have available, so that they will give even less for higher available amounts.

H1.2. - Proposers being aware of playing with a woman in the IG will offer, on average, lower shares than in the case of playing of a man instead.

If the responder is a woman instead of a man, offers will be even more unfair, since previous literature shows that both men and women make lower offers to women than to men (Solnick, 2001, p.199).

H2.1. - The rejection rate will decrease with the stake size.

A previous study in the ultimatum game finds out that rejection patterns are reduced with the amount at stake (Andersen et al., 2011). In the IG, responders are found to reject unfair offers around 30-40% of the time (Yamagishi et al., 2009). They do so knowing that their rejection has no effect over the proposer, because they are motivated by revenge, or they emotionally respond to a negative emotion such as disgust or anger (Takagishi et al., 2009). However, as the stake size increases, the cost of rejection increases, and they will be less willing to renounce to their earnings.

H2.2. – The frequency of rejection by responders will be higher (lower) when the proposer is a woman (man).

Previous literature on the dictator and the ultimatum games shows that women are generally more generous than men (Eckel & Grossman, 2001; Rigdon et al., 2009), and are also expected to be so (Solnick, 2001; Brañas-Garza et al., 2018). Taking this into account, women are expected to be punished more than men for their selfish behaviour.

3. Data analysis and main results

3.1. Descriptive Statistics

The first part of this section is aimed at showing the main descriptive statistics of the sample of subjects.

Our sample has a total number of 1,210 observations. Regarding the distribution of gender, there are 714 women and 496 men. The sample covers a great range of ages, from 17 to 72 years old, with an average of 27.2 years old. The following table shows the main descriptive statistics of some of the variables we want to control for in the analysis. Later, we will present additional graphs for the rest of the variables not included here.

[Table 2 here]

Additionally, as regards birthplace, there are subjects from four different continents (Oceania is not represented in our sample), and 35 countries.

Figure 1 shows the distribution by continent of origin, and Table 3 presents the list of countries represented in our sample.

[Table 3 here]

[Figure 1 here]

Figure 2 shows the distribution of the sample by employment status. The most representative productive sector is the tertiary (services), followed by the secondary (industry) sector. There are also two small groups of pensioners and unemployed subjects.

[Figure 2 here]

3.2. Econometric Analysis

We detect a divergence between the number of subjects who are employed (1,080), and the observations for the three sectors of activity (391). Therefore, we decide to omit these sectors from the analysis, since just 36.20% of the subjects who are working declare the sector in which they are working.

Furthermore, when checking the data, we observe that in most of the cases in which subjects do not indicate their activity sector, they affirm they are students. Hence, there are many situations in which subjects are both students and workers but do not explain this fact, even though they had the chance to do it. Knowing this, we check for a possible correlation between the variables *Student* and *Unemployed*, and we find a significant and negative correlation coefficient [-0.3501***]. Then, we include an interaction term for both variables within the regression models, but that term is omitted because of collinearity. At last, we decide to suppress one of the regressors to solve this problem; we exclude *Student* from the analysis.

Finally, we also include a dummy *North* for checking whether there is some effect of being located in a northern rather than in a southern country.

3.3. Analysis of proposers' decisions

Figure 3 shows the distribution of offers proposed as percentage of the total amount available for subjects. It can be observed that average giving is around 40% and about

half of proposers give 40 or 50% of the amount at stake. However, there is an important share of players offering 0 to their partners.

[Figure 3 here]

[Table 4 here]

It has been checked that our dependent variable, the share from the total endowment proposers decide to give, does not follow a normal distribution (Shapiro-Wilk W test for normal data: p-value close to 0), and therefore, the methods used are non-parametric. In particular, to test differences between groups the Mann-Whitney U test is used.

[Table 5 here]

❖ **Result 1.** Subjects are more generous towards women than towards men in the IG when facing a high stake.

When the stake size is high, there is a significant effect of gender identification (5%) showing that subjects are more generous with women (T3 vs. T4). This result is confirmed by model P10 in table 8.

❖ **Result 2.** Giving in the IG increases for higher stake sizes when proposers play with a woman.

There is a highly significant difference on giving (1%) between T1 and T3, showing that subjects give more the more they have, when the responder is a woman. Model PW in table 8 shows this effect.

❖ **Result 3.** Female proposers in the IG give more to women than to men.

When testing for differences between groups regarding gender pairing, a significant effect (at 5%) is found when comparing the pairs W-M vs. W-W [Mann-Whitney U test, z=-2.5, p-value=0.012]. That is, giving significantly varies when the proposer is a woman

depending on the gender of the responder. If we estimate a model for checking this effect, we find a positive and significant coefficient for the gender of the responder [0.055 (p-value=0.011)].

❖ **Result 4.** Giving in the IG is positively determined by the level of extraversion.

The Spearman's rank correlation coefficient shows this relationship with a value of $\rho=0.124$ (p-value=0.002). Additionally, the positive and significant coefficients for extraversion found in the four models we estimate, confirm that those subjects who are more extraverted are likely to give more.

❖ **Result 5.** The more emotionally intelligent proposers are, the more they offer to responders in the IG.

Emotional intelligence is a variable positively determining giving [$\rho=0.136$, p-value=0.001]. This is also shown by the positive and significant coefficients of this variable in models P5 and PM.

❖ **Result 6.** As the level of primary psychopathy increases, subjects give less in the IG.

Primary psychopathy has a negative and significant effect on giving in models P5, PW and PM. The Spearman's rank correlation coefficient has a value of $\rho=0.164$ in this case, with a p-value close to 0.

❖ **Result 7.** Americans are less generous than Europeans.

The correlation coefficient between America and Europe gives us a $\rho=-0.824$, with a p-value close to 0. The negative and significant coefficients found in models P10 and PW corroborate a decrease on giving if the subject is located in America.

❖ **Result 8.** Pensioners in the IG are marginally more generous.

The Spearman's rank correlation coefficient of ρ=0.063, with a p-value=0.090 shows a positive and marginally significant (at 10%) relationship between these variables. Models P5 and PW reflect this positive but marginal effect on giving of being retired.

3.4. Analysis of responders' decisions

As regards the responder side, now the distribution of accepting/rejecting decisions over the different distribution options the responders face, that is, the data corresponding to the strategy method, is presented. Figure 4 shows the information on treatments with a stake of 5€, whereas Figure 5 does it for the treatments with a stake of 10€.

[Figure 4 here]

[Figure 5 here]

As it can be observed, subjects are mostly willing to accept any positive offer. When the stake is low, they increasingly accept positive offers, but they are less likely to get between 80% and 100% of the total amount. When the stake is high, there are more variations but, in general, subjects are also likely to accept any positive offer. Nearly all of them would accept an equal division of the stake but, when the offer reaches 60%, the percentage of acceptance starts decreasing.

[Table 6 here]

[Table 7 here]

As regards the role of responder, when testing the significance of the differences among treatments, both comparing gender (T5 vs. T6; T7 vs. T8) and stake size (T5 vs. T7; T6 vs. T8) effects, none of the differences is statistically different from zero.

When testing for differences between groups regarding gender pairing, no significant differences are found.

4. Discussion and conclusions

As expected, we have found differences on generosity driven by the size of the stake and the gender of the responder. All findings suggest greater generosity levels towards women. First, women are more generous towards other women. Second, with low stakes, there is no variation on the degree of generosity, whereas with high stakes subjects give more to women. Finally the amount given increases with the stake size only when proposers face a woman.

Regarding responders' behaviour, we find no specific effects of varying the size of the stake, nor of the gender of the proposer. However, in general, we observe low rejection rates around 12.44%, on average. Thus, subjects mainly accept offers, even though they may be unfair, consistently with the game theoretical prediction. In this respect, we suggest two possible motives for this finding. First, differences regarding the sample of subjects, as previous studies used undergraduate students in their experiments (Yamagishi et al., 2009; Takagishi et al., 2009; Balafoutas & Jaber-Lopez, 2018), while we have a more extensive sample with both students and non-students. And second, there might be a general effect of social cues given to the responder. Concretely, when responders are aware of the gender information of the other player, rejection substantially decreases compared to when they do not have such information.

Additionally, we find some determinants of generosity and rejection patterns. On one hand, emotional intelligence has a positive effect on giving. This is consistent with the fact that emotional intelligence is related to empathy and empathy has been already linked to prosocial behaviour (Charbonneau & Nicol, 2002).

On the other hand, primary psychopathy, which negatively drives generosity. This can be explained by the traits that are analysed by this psychopathy scale; in particular, the selfish, uncaring and manipulative posture towards others (Levenson et al., 1995).

Furthermore, extraversion levels, indicating that more extraverted people are also more generous. This is consistent with the finding that extraversion positively drives altruism (Oda et al., 2014). Extraversion has also been related to empathy (Jolliffe & Farrington, 2006), and as stated before, empathy is linked to prosocial behaviour.

Moreover, Americans are found to give less than Europeans. There might be some economic motives on this difference (e.g., GDP per capita), as well as some historical and other non-economic reasons such as cultural differences. However, we leave this discussion for further research.

Finally, retired subjects are more generous. As far as we know, there are no previous studies controlling for this effect. We suggest this finding may be partly driven by the effect of age, as older subjects are generally found to be more altruistic (Sparrow et al., 2021). However, we believe there might be other causes for this behaviour, and further research should be carried out to analyse this question in deep.

References

Andersen, S., Ertaç, S., Gneezy, U., Hoffman, M., & List, J. A. (2011). Stakes matter in ultimatum games. *American Economic Review*, *101*(7), 3427-39.

Balafoutas, L., & Jaber-Lopez, T. (2018). Impunity under pressure: On the role of emotions as a commitment device. *Economics Letters*, *168*, 112-114. https://doi.org/10.1016/j.econlet.2018.04.027

Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, *75*(3), 729-750.

Ben-Ner, A., Kong, F., & Putterman, L. (2004). Share and share alike? Gender-pairing, personality, and cognitive ability as determinants of giving. *Journal of Economic Psychology*, *25*(5), 581-589. https://doi.org/10.1016/S0167-4870(03)00065-5

Bolton, G. E., Katok, E., & Zwick, R. (1998). Dictator game giving: Rules of fairness versus acts of kindness. *International Journal of Game Theory*, *27*(2), 269-299. https://doi.org/10.1007/s001820050072

Brañas-Garza, P., Capraro, V., & Rascon-Ramirez, E. (2018). Gender differences in altruism on Mechanical Turk: Expectations and actual behaviour. *Economics Letters*, *170*,19-23. https://doi.org/10.1016/j.econlet.2018.05.022

Charbonneau, D., & Nicol, A. A. (2002). Emotional intelligence and prosocial behaviors in adolescents. *Psychological Reports*, *90*(2), 361-370. https://doi.org/10.2466/pr0.2002.90.2.361

Eckel, C. C., & Grossman, P. J. (2001). Chivalry and solidarity in ultimatum games. *Economic Inquiry*, *39*(2), 171-188. https://doi.org/10.1111/j.1465-7295.2001.tb00059.x

Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, *25*, 167-177. https://doi.org/10.1016/S0191-8869(98)00001-4

Holt, C. A., & Laury, S. K. (2002). Risk aversion and incentive effects. *American Economic Review*, *92*(5), 1644-1655.

Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence*, *29*(4), 589-611. https://doi.org/10.1016/j.adolescence.2005.08.010

Larney, A., Rotella, A., & Barclay, P. (2019). Stake size effects in ultimatum game and dictator game offers: A meta-analysis. *Organizational Behavior and Human Decision Processes*, *151*, 61-72.

https://doi.org/10.1016/j.obhdp.2019.01.002

Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, *68*(1), 151. https://doi.org/10.1037/0022-3514.68.1.151

Oda, R., Machii, W., Takagi, S., Kato, Y., Takeda, M., Kiyonari, T., & Hiraishi, K. (2014). Personality and altruism in daily life. *Personality and Individual Differences*, *56*, 206-209. https://doi.org/10.1016/j.paid.2013.09.017

Rigdon, M., Ishii, K., Watabe, M., & Kitayama, S. (2009). Minimal social cues in the dictator game. *Journal of Economic Psychology*, *30*(3), 358-367. https://doi.org/10.1016/j.joep.2009.02.002

Rodríguez, J. M., Riquelme, A. A., & Fernández, M. E. (2018). Análisis psicométrico de la escala de psicopatía de Levenson. *Psicopatología Clínica Legal y Forense*, *18*(1), 134-150.

Solnick, S. J. (2001). Gender differences in the ultimatum game. *Economic Inquiry*, *39*(2), 189-200. https://doi.org/10.1111/j.1465-7295.2001.tb00060.x

Sparrow, E. P., Swirsky, L. T., Kudus, F., & Spaniol, J. (2021). Aging and altruism: A meta-analysis. *Psychology and Aging*, *36*(1), 49-56. https://doi.org/10.1037/pag0000447

Takagishi, H., Takahashi, T., Toyomura, A., Takashino, N., Koizumi, M., & Yamagishi, T. (2009). Neural correlates of the rejection of unfair offers in the impunity game. *Neuroendocrinology Letters*, *30*(4), 496-500.

Voslinsky, A., & Azar, O. H. (2021). Incentives in experimental economics. *Journal of Behavioral and Experimental Economics*, *93*, 101706. https://doi.org/10.1016/j.socec.2021.101706

Yamagishi, T., Horita, Y., Takagishi, H., Shinada, M., Tanida, S., & Cook, K. S. (2009). The private rejection of unfair offers and emotional commitment. *Proceedings of the National Academy of Sciences*, *106*(28), 11520-11523. https://doi.org/10.1073/pnas.0900636106

Appendix A: *Econometric analysis*

In this appendix we include in Tables 8 and 9 all the regressions implemented using the same variables. We produce eight models, each one combining two of the treatments. All in all, four of the regressions are presented for the comparison of the treatments in which subjects play the role of proposer, and the other four correspond to the treatments in which the participant plays as the responder.

The coding for each model is: first, the role of the player, either proposer (P) or responder (R); second, the common characteristic of the two treatments under comparison: W or M if the opponent is a woman or a man, respectively; 5 (10) depending on the stake size for treatments compared. Thus, the model RW refers to the comparison of treatments T5 and T7, where the player has the role of responder, and the opponent is a woman in both cases. Therefore, the varying element analysed in that case is the stake size, which is 5€ for T5 and 10€ for T7.

In P5, P10, PW and PM the dependent variable is the share the proposer decides to give to the responder. Since our dependent variable is censored, we estimate Tobit models. In particular, the model assumes that subjects who gave nothing would have even wanted to take some amount from the other player if possible by design. Therefore, we set a lower limit at zero. Similarly, those who gave everything would have wanted to give more if they had had the possibility to do it. Hence, we set an upper limit at 1. All the models are estimated using robust standard errors.

In R5, R10, RW and RM, the dependent variable is binary, taking the value 1 if the responder decides to accept the offer, and 0 otherwise. Hence, we use logistic regressions.[3]

---

[3] The output of the probit modelization is available upon request. Results are similar.

Table 8: Tobit results for proposers' behaviour

	MODEL			
	P5	**P10**	**PW**	**PM**
TREATMENTS	*T1 vs. T2*	*T3 vs. T4*	*T1 vs. T3*	*T2 vs. T4*
ROLE	*Proposer*			
DEFINITION	*Low stake- Gender Effect*	*High stake - Gender Effect*	*Woman - Stake Size Effect*	*Man - Stake Size Effect*
Treatment Effect	0.005	-0.064*	0.060*	-0.014
BFI_Extraversion	0.150**	0.142*	0.117*	0.152**
BFI_Agreeableness	0.042	0.006	0.109	-0.027
BFI_Conscientiousness	0.002	0.035	0.050	-0.046
BFI_Neuroticism	-0.062	0.007	0.009	-0.036
BFI_Openness	0.087	-0.063	-0.009	0.051
Emotional Intelligence	0.176**	0.067	0.075	0.140**
HoltandLaury_Number of Safe Choices	0.007	0.002	-0.006	0.019*
Primary Psychopathy	-0.023***	-0.008	-0.010**	-0.019***
Secondary Psychopathy	0.008	-0.011*	-0.001	-0.009
Gender	0.052	0.031	0.061	0.025
Age	-0.001	0.007**	0.000	0.003
Africa	-0.008	-0.051	-0.038	0.059
Asia	-0.022	0.047	-0.022	0.085
America	-0.020	-0.139*	-0.325***	0.088
North	-0.038	0.001	-0.270****	0.123
Number of children	-0.012	-0.068	-0.060	-0.011
Number of girls	0.110	0.003	0.109	0.012
Secondary Education	0.096	-0.269*	-0.079	0.098
Tertiary Education	0.044	-0.356**	-0.085	-0.020
Unemployed	-0.017	-0.198**	-0.051	-0.071
Retired/Pensioner	0.311*	-0.145	0.174*	0.093
N	300	299	294	305
Pseudo R2	0.146	0.149	0.117	0.158

$* \ p < 0.10$; $** \ p < 0.05$; $*** \ p < 0.01$

Table 9: Logit results for responders' behaviour

	MODEL			
	R5	R10	RW	RM
TREATMENTS	*T5 vs. T6*	*T7 vs. T8*	*T5 vs. T7*	*T6 vs. T8*
ROLE	*Responder*			
DEFINITION	*Low stake-Gender Effect*	*High stake - Gender Effect*	*Woman - Stake Size Effect*	*Man - Stake Size Effect*
Treatment Effect	-0.401	-0.555	0.319	0.177
BFI_Extraversion	0.120	-0.350	0.326	-0.084
BFI_Agreeableness	-0.575	-0.407	-0.120	-0.485
BFI_Conscientiousness	-0.103	-0.479	0.119	-0.744
BFI_Neuroticism	0.993	0.135	0.563	0.040
BFI_Openness	-0.028	-0.539	-0.280	-0.036
Emotional Intelligence	0.659	0.303	0.512	0.213
HoltandLaury_Number of Safe Choices	0.022	0.074	0.135	0.008
Primary Psychopathy	-0.059	0.097*	-0.006	0.063
Secondary Psychopathy	0.065	-0.040	-0.038	0.030
Gender	-0.240	-0.380	-0.423	0.002
Age	0.053	0.019	0.040	0.055
Africa	-0.600	-0.731	-0.183	-1.032
Asia	-0.939	0.000	-0.618	-2.395
America	-0.881	-0.041	-0.194	-0.493
North	-0.163	-1.248	-1.010	-0.200
Number of children	-0.765	-0.983*	-0.453	-1.340**
Number of girls	1.260	0.343	-0.234	1.315
Secondary Education	2.734**	-0.031	1.454	1.378
Tertiary Education	2.658**	-0.908	0.893	1.071
Unemployed	-0.507	-0.291	-0.332	-0.085
Retired/Pensioner	-1.165	1.169	-1.272	-0.193
N	285	296	292	289
Pseudo R2	0.242	0.263	0.251	0.214

* p < 0.10 ; ** p < 0.05 ; *** p < 0.01

Table 1. Summary of the treatment characteristics

	ROLE	STAKE SIZE	OPPONENT'S GENDER	N
T1	Proposer	5€	Woman	148
T2	Proposer	5€	Man	160
T3	Proposer	10€	Woman	151
T4	Proposer	10€	Man	155
T5	Responder	5€	Woman	148
T6	Responder	5€	Man	146
T7	Responder	10€	Woman	150
T8	Responder	10€	Man	152

Table 2. Descriptive statistics of variables collected

Variable	N	Mean	Standard deviation	Min.	Max.
Extraversion – BFI	1,210	2.80	0.23	1.75	3.75
Agreeableness – BFI	1,210	3.09	0.32	2	4.11
Conscientiousness – BFI	1,210	2.89	0.37	1.67	4.22
Neuroticism – BFI	1,210	3.18	0.30	2	4.25
Openness – BFI	1,210	2.99	0.35	1.9	4.91
Emotional intelligence	1,210	3.67	0.33	2.52	3.67
LSRP primary	1,210	37.50	3.84	19	53
LSRP secondary	1,210	22.41	3.16	12	34
HL Number of safe choices	1,210	4.94	2.13	0	10
Gender (dummy)	1,210	0.59	0.49	0 (man)	1 (woman)
Age	1,210	27.18	10.59	17	72
Number of children	1,210	0.20	0.60	0	5
Number of daughters	1,205	0.10	0.38	0	3
Level of education	1,210	2.71	0.48	1	3

Table 3. Distribution of countries represented in the sample, by continent

EUROPE	ASIA	AMERICA	AFRICA
Andorra	China	Argentina	Algeria
Bulgaria	Japan	Bolivia	Congo
France	Nepal	Brazil	Morocco
Germany	Saudi Arabia	Chile	Nigeria
Greece		Colombia	
Italy		Cuba	
Moldavia		Dominican Republic	
Portugal		Ecuador	
Romania		Equatorial Guinea	
Russia		Mexico	
Switzerland		Peru	
Ukraine		Uruguay	
United Kingdom		Venezuela	

Table 4. Percentage of the amount at stake given by the proposers (T1 to T4)

Treatment	Amount at stake	Percentage of giving	Responder's gender
T1	5€	34.32%	Woman
T2	5€	33.63%	Man
T3	10€	38.28%	Woman
T4	10€	33.23%	Man
Global average	**-**	**34.86%**	**-**

Table 5. Mann Whitney U test results and p-values (in parenthesis) for treatment effects

(T1 to T4)

	Test
T1 vs. T2	0.550 (0.582)
T1 vs. T3	-3.012 (0.003)
T2 vs. T4	-1.011 (0.312)
T3 vs. T4	2.131 (0.033)

Table 6. Percentage of rejected proposals (T5 to T8)

Treatment	Offer	Amount at stake	Rejection rate	Proposer's gender
T5	1€	5€	12.16%	Woman
T6	1€	5€	15.75%	Man
T7	2€	10€	8.67%	Woman
T8	2€	10€	13.16%	Man
Global average		**-**	**12.44%**	**-**

Table 7. Mann Whitney U test results and p-values (in parenthesis) for treatment effects

(T5 to T8)

	Test
T5 vs. T6	0.887 (0.375)
T5 vs. T7	-0.987 (0.324)
T7 vs. T8	1.249 (0.212)
T6 vs. T8	-0.636 (0.525)

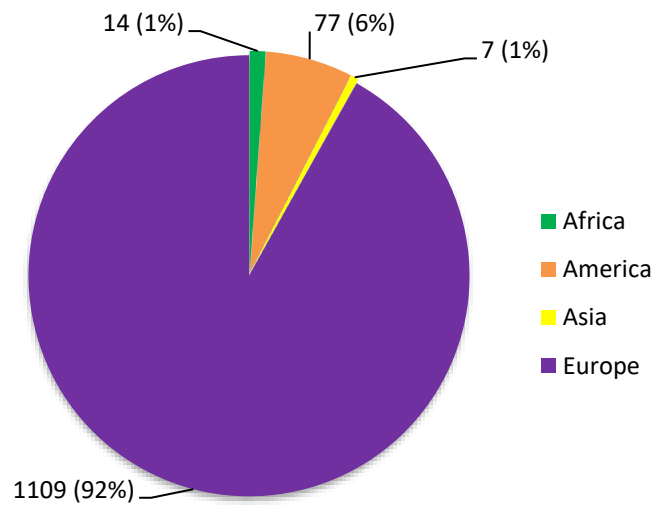**Figure 1.** Number of observations and frequency by continent

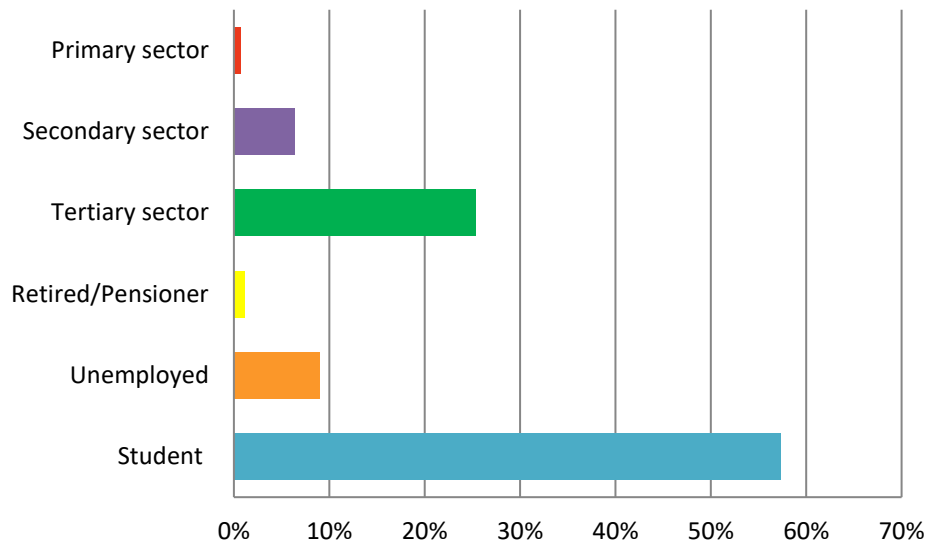**Figure 2.** Distribution of the sample by employment status

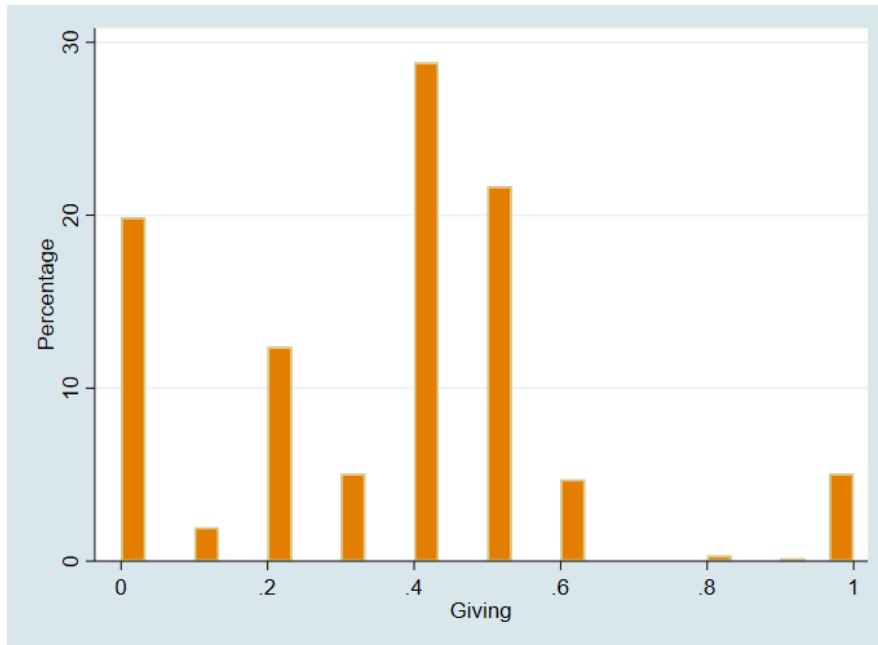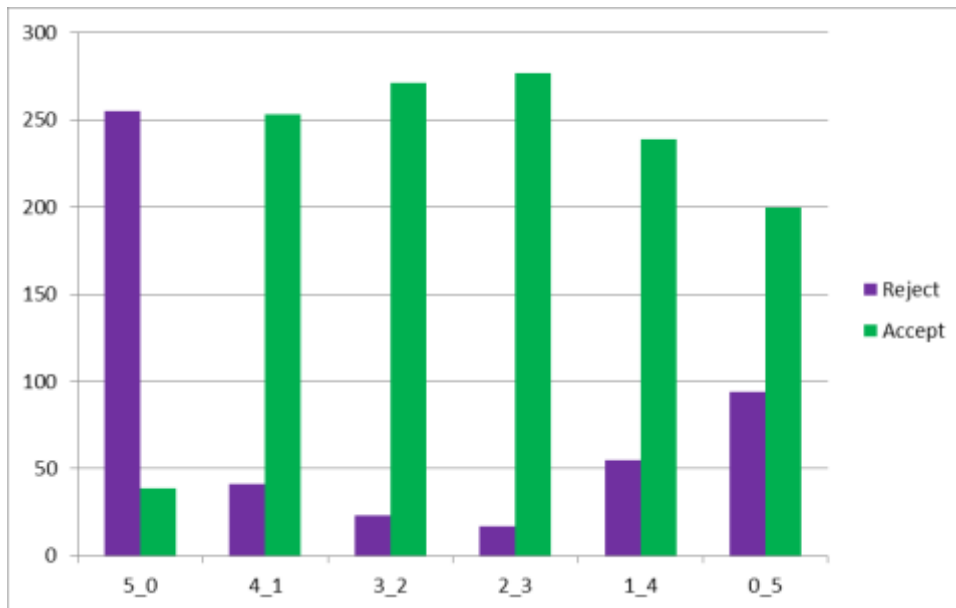**Figure 3.** Histogram showing the distribution of offers

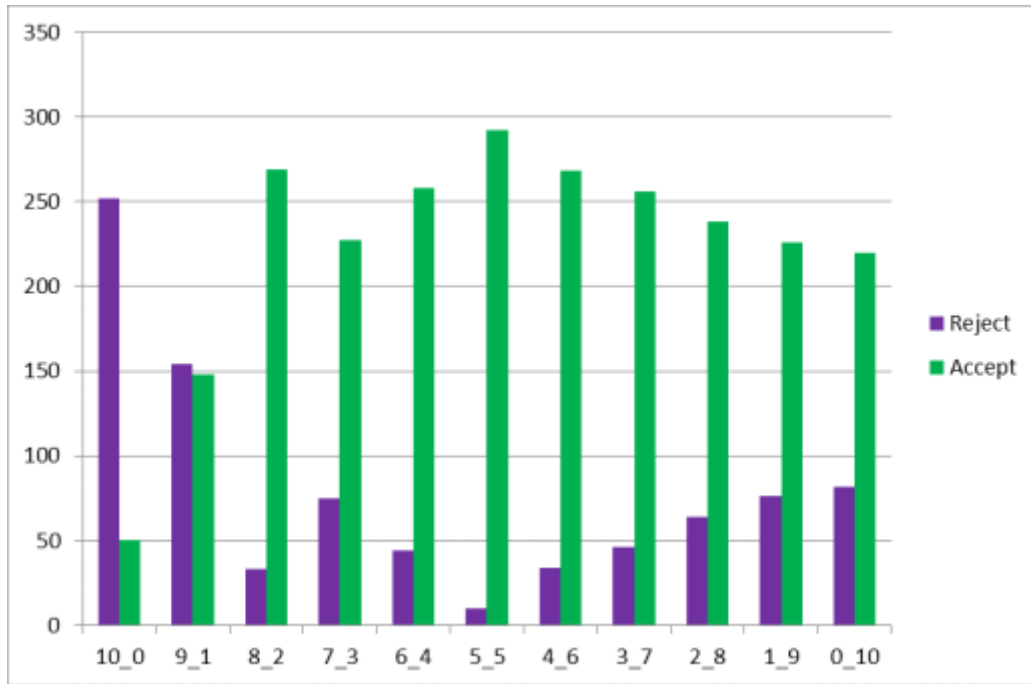**Figure 4**. Histogram showing the decisions of responders over different distributions of

5€

Distribution	Rejection	Acceptance
5_0	86.73%	13.27%
4_1	13.95%	86.05%
3_2	7.82%	92.18%
2_3	5.78%	94.22%
1_4	18.71%	81.29%
0_5	31.97%	68.03%

Figure 5. Histogram showing the decisions of responders over different distributions of

10€

Distribution	Rejection	Acceptance
10_0	83.44%	16.56%
9_1	50.99%	49.01%
8_2	10.93%	89.07%
7_3	24.83%	75.17%
6_4	14.57%	85.43%
5_5	3.31%	96.69%
4_6	11.26%	88.74%
3_7	15.23%	84.77%
2_8	21.19%	78.81%
1_9	25.17%	74.83%
0_10	27.15%	72.85%

Appendix B: *Experimental Instructions (originally in Spanish)*

Welcome and thank you for your participation.

In this survey, you will have to answer to a set of questions. It is important that you read thoughtfully the given instructions, since they allow you to understand the context under which the different decisions must be made. Please, answer carefully and sincerely. **It will take you no more than 10 minutes**.

The anonymity of your responses is totally guaranteed.

Only for participating, you will enter the draw of **30 awards of 50€**. The draw will take place once the current Alarm Status finishes.

Thank you very much for your collaboration.

At this point, each participant must answer the questions of the following tests:

- *Spanish Big Five Inventory* (Benet-Martínez and John, 1998)

- *The 33-item emotional intelligence scale* (Hall et al., 1998)

- *Test for risk aversion* (Holt and Laury, 2002)

- *Levenson's Self-Report Psychopathy Scale* (Levenson, Kiehl and Fitzpatrick, 1995; Rodríguez, Riquelme and Fernández, 2018).

Now, you are going to decide in an economic context that will be described afterwards. For that, you will be assigned randomly one of the following roles: **PROPOSER** or **RESPONDER**.

You must move to the next screen to see the role you have been assigned and to know the framing in which you will make your decision.

Proposer's instructions (Example: T1)

<div align="center">You have been assigned the role of PROPOSER</div>

As a **PROPOSER**, you will get an amount of money that you can share, or not, with another person, the **RESPONDER**.

In the next screen, we will tell you the amount you have, and, in addition, we will give you a hint about the identity of the **RESPONDER**. We will give you a descriptive characteristic of that person.

Please, move on to the next screen.

<center>You have the role of **PROPOSER**</center>

You are given 5 euros. Now, you must decide which amount of that money you give to the **RESPONDER.** But before deciding, we are going to give you a piece of information about the other person. That information is that it is:

<center>**A WOMAN**</center>

Now, please choose how much money you want to give to the RESPONDER, from 0 to 5 euros:

0	1	2	3	4	5
○	○	○	○	○	○

Responder's instructions (Example: T5)

<center>You have been assigned the role of **RESPONDER**</center>

As a **RESPONDER**, you will get an amount of money from the **PROPOSER** that you can accept or not. If you accept, the money will be divided as the **PROPOSER** chose. If you reject, you will get no money, whereas the **PROPOSER** will keep the amount initially chosen.

In the next screen, we will tell you the amount offered to you, and, in addition, we will give you a hint about the identity of the **PROPOSER**. We will give you a descriptive characteristic of that person.

Please, move on to the next screen.

<center>You have the role of **RESPONDER**</center>

The **PROPOSER** has 5 euros and has decided to keep **4** euros and give **1** to you. Before making your decision about accepting or rejecting that amount, we are going to give you a piece of information about the other person. That information is that it is:

A WOMAN

Now, please choose one of the following options:

○ **Accept the offer**. You get 1 euro and the proposer 4 euros.

○ **Reject the offer**. You get 0 euros and the proposer 4 euros.

Now, please indicate what would be your decision for each of the following situations with respect to the distribution of the money:

	Accept the offer	Reject the offer
The proposer keeps 5 euros and gives you 0	○	○
The proposer keeps 3 euros and gives you 2	○	○
The proposer keeps 2 euros and gives you 3	○	○
The proposer keeps 1 euro and gives you 4	○	○
The proposer keeps 0 euros and gives you 5	○	○

In order to finish the survey, please answer to the following questions:

Which gender are you more identified with?

○ Woman

○ Man

How old are you?

Age [   ]

Indicate your country of birth.

[   ]

Do you have children?

YES   **NO**

○   ○

How many children do you have? How many girls and boys?

[   ]

What is the highest level of education you have attained?

○ Primary education (School)

○ Secondary education (High School, Vocational Training of Middle Grade)

○ Tertiary education (University Studies [Degree, PhD], Advanced Vocational

Training)

In which of the following groups can be included your work activity?

○   Primary sector (agriculture, farming, fishing,…)

○   Industry sector

○   Service sector (transport, trade, tourism, hospitality,…)

○   Unemployed

○   Others

[   ]

○ I am a student

If you are interested in participating in the draw of 30 awards of 50€, enter your

e-mail address in the following space.

[   ]