



# Standard vs random dictator games: On the effects of role uncertainty and framing on generosity

Ernesto Mesa-Vázquez<sup>a</sup>, Ismael Rodríguez-Lara<sup>b,c,\*</sup>, Amparo Urbano<sup>a</sup>

<sup>a</sup> Universidad de Valencia, ERICES, Spain

<sup>b</sup> Department of Economics, Universidad de Granada, Spain

<sup>c</sup> Economic Science Institute (ESI), Chapman University, United States of America

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## ABSTRACT

We show that generosity is affected when we vary the level of role uncertainty, i.e., the probability that the dictator's decision will be implemented. We also show that framing matters for generosity in that subjects are less generous when they are told that their choices will be implemented with a certain probability, compared with a setting in which they are told that their choices will *not* be implemented with certain probability.

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## 1. Introduction

People may be more likely to exhibit pro-social or generous behavior when they perceive it is unlikely that their choices will be implemented, while more selfish or self-interested behavior may be observed when people perceive that their actions are likely to have economic consequences for others. This can be observed when people face uncertain commitments; e.g., helping a relative who is sick or a friend who needs to move, etc. In fact, there is ample evidence that people may want to appear as fair to feel better themselves or to receive recognition from others (Andreoni, 1990; Andreoni and Bernheim, 2009; Dana et al., 2007; Ottoni-Wilhelm et al., 2017).

Our results suggest that both the framing and the level of role uncertainty affect generosity. These findings add the current literature on various fronts. When eliciting generous behavior, researchers have either employed the standard dictator game (in which there is no role uncertainty) or random dictator games (in which all participants make their choices as if they were dictators and then only half of the choices are implemented). There is also a bunch of papers that examine generosity in *risky*

*dictator games* in which dictators choose between a “safe option” and a “risky option” or *probabilistic dictator games* in which dictators redistribute probabilities of winning a prize (Dana et al., 2007; Cettolin et al., 2017; Krawczyk and Le Lec, 2010; Karni et al., 2008; Brock et al., 2013; Saito, 2013; Exley, 2016). Yet the experimental evidence that examines how role uncertainty influences generous behavior is very limited. In fact, the only exception we know is (Iriberry and Rey-Biel, 2011) who find in a repeated game that selfish choices are more frequent when there is no role uncertainty (i.e., when participants know who will be the dictator), while altruistic choices are more frequent when there is role uncertainty (i.e., when participants do not know who will be the dictator).<sup>1</sup> We build on their work to show that the probability of the choice being implemented and the framing of the decision are key to explain generosity in a one-shot dictator game. Our results also contribute to the experimental evidence that shows that framing affects generosity (Capraro and

\* Corresponding author at: Department of Economics, Universidad de Granada, Spain.

E-mail address: [ismaelr@ugr.es](mailto:ismaelr@ugr.es) (I. Rodríguez-Lara).

<sup>1</sup> As already noted in Iriberry and Rey-Biel (2011) choices under role uncertainty differ from choices under the veil of ignorance (Rawls, 1971; Harsanyi, 1977) as the latter implies that the decision-makers' choices will be implemented but they do not know what their final role in the game would be; i.e., decision-makers under the veil of ignorance do not know whether they will receive the payoff associated to the dictator or the recipient. See Frignani and Ponti (2012) for decisions under the veil of ignorance in the dictator game.

Vanzo, 2019; Brañas-Garza, 2007). In particular, we argue that framing choices as dictators or recipients may affect the feelings of ownership and this may have consequences for giving.

## 2. Experimental design and hypotheses

### 2.1. Experimental design

We rely on the strategy method and present subjects with a multiple probability list (MPL) dictator game in which subjects are asked to split an endowment of 10€ between themselves and another participant. Each subject makes a total of 11 choices. In the Dictator-Frame, subjects are confronted with the probability  $p \in \{1, 0.9, \dots, 0.1, 0\}$  that their choices will be implemented (with the remaining probability they will be selected as recipients, thus their choice will not be implemented). In the Recipient-Frame, choices vary with the probability  $q \in \{1, 0.9, \dots, 0.1, 0\}$  of being selected as recipients; i.e., subjects are presented with the probability that their choices will not be implemented. Fig. 1 presents the decision table of subjects in each frame.<sup>2</sup> The instructions are presented in Appendix A.

At the end of the experiment, we collected a number of individual variables regarding basic demographics (i.e., age and gender), risk preferences, cognitive reflection and taste for advantageous and disadvantageous taste for inequality.

### 2.2. Procedures

The experiment was held at the Universidad de Sevilla in April 2019. A total of 88 students with no previous experience participated in our experiment. Students were placed in two different rooms and received the instructions for the Dictator-Frame ( $N = 44$ ) or the Recipient-Frame ( $N = 44$ ). To pay participants, we randomly matched them in pairs and selected one of the rows for payment. We then implemented either the “dictator” or the “recipient” choice depending on the probabilities associated to the selected row by extracting a second ball from a different urn.<sup>3</sup> Participants received 5 Euros as show-up payment.

### 2.3. Hypotheses

The theoretical prediction under the assumption that subjects are purely selfish is that they will give nothing away, regardless of their role in the game or the probability that their choices will be implemented; thus all choices should be the same in the MPLs. Our main hypothesis, however, is that giving decreases with the probability that the decision will be implemented, thus subjects in the role of dictators or recipients are expected to give more when it is unlikely that their choices will be implemented.

**H1.** *Giving decreases with the probability that the decision will be implemented.*

The recent article by Korenok et al. (2017) suggest that feelings of ownership can affect generosity. The feelings of ownership are affected in their setting when dictators earn the endowment or their decision is framed as giving to the recipient or taking from the recipient. In our experiment, we attempt to affect the feelings

<sup>2</sup> Our study included two other conditions in which the probabilities of being dictator or recipient ranged from 0.9 to 0.1. Our findings are robust to these probabilities, but the interested reader can consult (Mesa-Vázquez et al., 2019) for further details.

<sup>3</sup> Imagine that row 5 was selected for payment. This implies that the choice of the Dictator-Frame (Recipient-Frame) was implemented with a probability of 0.6 (0.4), respectively. We then extracted a ball from a different urn: if the number was 1-6 then we implemented the decision of participant in the Dictator-Frame; otherwise, the choice we implemented was the one of the participant in the Recipient-Frame.

of ownership by changing the framing of the decision. We argue that subjects will have a have stronger feelings of ownership in the Dictator-Frame than in the Recipient-Frame, thus subjects will give less in the role of dictators compared with giving in the role of recipients.

**H2a.** *Giving in the Recipient-Frame is higher than giving in the Dictator-Frame because the frame will affect the feelings of ownership.*

A second feature that can affect giving in each frame refers to the cognitive load associated to giving. When subjects are in the Recipient-Frame, they are confronted with the probabilities that their choices will not be implemented (i.e., they have to think that choices will be implemented with the complementary probability). This can increase their cognitive effort and may reduce giving, as suggested in Schulz et al. (2014).<sup>4</sup>

**H2b.** *Giving in the Recipient-Frame is lower than giving in the Dictator-Frame because of the cognitive load associated to giving.*

## 3. Results

Fig. 2 shows the average giving in each frame, depending on the level of role uncertainty; i.e., the horizontal axis shows the probabilities that the decision will be implemented. In the Dictator-Frame, this corresponds to the value of  $p$  that was presented to subjects in the MPL, while the values for the Recipient-Frame has been transformed to indicate the probability that the choice will be implemented; therefore the probabilities correspond to  $(1 - q)$  in the MPL.<sup>5</sup> We include in each panel the average giving and the standard deviation, using each subject as an independent observation. We also present the fraction of selfish allocations (i.e., giving nothing) and egalitarian allocations (i.e., giving half).<sup>6</sup>

First, we find support for H1 that giving decreases with the probability of the choice being implemented; i.e., the Jonckheere-Terpstra test suggests a negative trend in both frames ( $p < 0.001$ ).

**Result 1.** *Subjects give less (i.e., they are more selfish) when there is a high probability that their choice will be implemented.*

Second, when we compare the level of generosity across frames we find that subjects in the Dictator-Frame are more generous than subjects in the Recipient-Frame (3.69 vs 4.89). The difference is statistically significant using a Wilcoxon rank-sum test ( $p < 0.001$ ) or the Kolmogorov-Smirnov test ( $p < 0.001$ ). This, in turn, provides evidence in favor of H2a.<sup>7</sup>

**Result 2.** *Subjects in the Dictator-Frame give less (i.e., they are more selfish) than subjects in the Recipient-Frame.*

## 4. Conclusion

Previous research has used dictator games in which subjects know their role in the game (standard dictator games) or they

<sup>4</sup> For evidence that the cognitive load does not affect generosity see Benjamin et al. (2013) or Hauge et al. (2016). According to Schulz et al. (2014) the results can be explained by differences in the cognitive load; e.g., subjects in Hauge et al. (2016) are asked to recall a seven-digit number, while subjects in Schulz et al. (2014) hear a series of letters and have to press a button whenever they hear a character that resounded two letters before, thus the latter task is more demanding in terms of cognitive effort.

<sup>5</sup> The choice when the probability is 0 corresponds to an hypothetical scenario in which subjects give under role certainty knowing that their choice will not be selected for sure.

<sup>6</sup> The data underlying the study is accessible at <https://x-econ.org> repository of Experimental Economics (DOI: <http://dx.doi.org/10.23663/x2654>).

<sup>7</sup> In Mesa-Vázquez et al. (2019) we show that these results are robust to an econometric analysis, where we control for the information collected in our questionnaire.

(a) Dictator-Frame			(b) Recipient-Frame		
Your choice (it should add up to 10€)			Your choice (it should add up to 10€)		
Prob. being decisor	€ You	€ Receiver	Prob. being receiver	€ You	€ Receiver
$p=1$			$q=1$		
$p=0.9$			$q=0.9$		
$p=0.8$			$q=0.8$		
$p=0.7$			$q=0.7$		
$p=0.6$			$q=0.6$		
$p=0.5$			$q=0.5$		
$p=0.4$			$q=0.4$		
$p=0.3$			$q=0.3$		
$p=0.2$			$q=0.2$		
$p=0.1$			$q=0.1$		
$p=0$			$q=0$		

Fig. 1. Decision table (MPL) in the Dictator-Frame (left-hand side) and the Recipient-Frame (right-hand side).

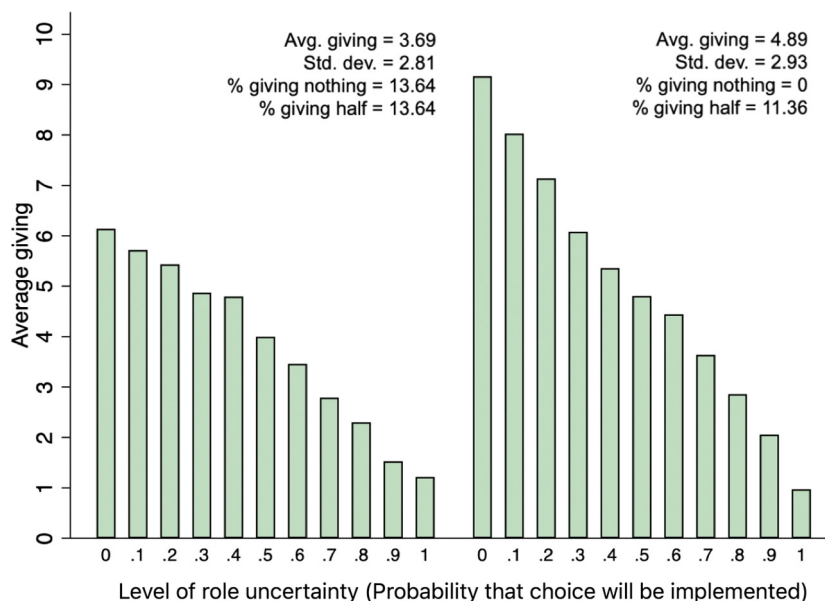


Fig. 2. Giving in the Dictator-Frame (left-panel) and the Recipient-Frame (right-panel).

choose in the role of dictators and then a random draw determines whether or not their choices are implemented (random dictator games in which there is role uncertainty). While the fundamental assumption is that generous behavior will be independent of the level of role uncertainty, we find that participants are more generous when it is unlikely that their choices will be implemented. We also find that framing affects generosity in that subjects are less generous when they are told that their choices will be implemented with a certain probability, compared with a setting in which they are told that their choices will *not* be implemented with certain probability.

We believe that these results advance our knowledge on the factors that influence generosity. Empirically, we provide evidence in favor of our hypotheses that role uncertainty and framing affect generosity. As a methodological implication, we share the view in Iriberry and Rey-Biel (2011) that random dictator games in which there is role or strategic uncertainty should be avoided to elicit generosity. In fact, we believe that introducing this role uncertainty can be used as an excuse not to donate in risky environments (Exley, 2016).

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## References

- Andreoni, J., 1990. Impure altruism and donations to public goods: A theory of warm-glow giving. *Econ. J.* 100 (401), 464–477.
- Andreoni, J., Bernheim, B.D., 2009. Social image and the 50–50 norm: A theoretical and experimental analysis of audience effects. *Econometrica* 77 (5), 1607–1636.
- Benjamin, D.J., Brown, S.A., Shapiro, J.M., 2013. Who is ‘behavioral’? Cognitive ability and anomalous preferences. *J. Eur. Econom. Assoc.* 11 (6), 1231–1255.
- Brañas-Garza, P., 2007. Promoting helping behavior with framing in dictator games. *J. Econ. Psychol.* 28 (4), 477–486.
- Brock, J.M., Lange, A., Ozbay, E.Y., 2013. Dictating the risk: Experimental evidence on giving in risky environments. *Amer. Econ. Rev.* 103 (1), 415–437.
- Capraro, V., Vanzo, A., 2019. The power of moral words: Loaded language generates framing effects in the extreme dictator game. *arXiv preprint arXiv:1901.02314*.
- Cettolin, E., Riedl, A., Tran, G., 2017. Giving in the face of risk. *J. Risk Uncertain.* 55 (2), 95–118.
- Dana, J., Weber, R.A., Kuang, J.X., 2007. Exploiting moral wiggle room: experiments demonstrating an illusory preference for fairness. *Econom. Theory* 33 (1), 67–80.
- Exley, C.L., 2016. Excusing selfishness in charitable giving: The role of risk. *Rev. Econom. Stud.* 83 (2), 587–628.
- Frignani, N., Ponti, G., 2012. Risk versus social preferences under the veil of ignorance. *Econom. Lett.* 116 (2), 143–146.
- Harsanyi, J.C., 1977. Morality and the theory of rational behavior. *Soc. Res.* 623–656.
- Hauge, K.E., Brekke, K.A., Johansson, L.-O., Johansson-Stenman, O., Svedsäter, H., 2016. Keeping others in our mind or in our heart? Distribution games under cognitive load. *Exp. Econ.* 19 (3), 562–576.
- Iriberry, N., Rey-Biel, P., 2011. The role of role uncertainty in modified dictator games. *Exp. Econ.* 14 (2), 160–180.
- Karni, E., Salmon, T., Sopher, B., 2008. Individual sense of fairness: an experimental study. *Exp. Econ.* 11 (2), 174–189.
- Korenok, O., Millner, E., Razzolini, L., et al., 2017. Feelings of ownership in dictator games. *J. Econ. Psychol.* 61, 145–151.
- Krawczyk, M., Le Lec, F., 2010. Give me a chance! an experiment in social decision under risk. *Exp. Econ.* 13 (4), 500–511.
- Mesa-Vázquez, E., Rodríguez-Lara, I., Urbano, A., et al., 2019. Standard vs Random Dictator Games. The Effect of Role Uncertainty on Generosity. Technical Report, Department of Economic Theory and Economic History of the University of Granada.
- Ottoni-Wilhelm, M., Vesterlund, L., Xie, H., 2017. Why do people give? Testing pure and impure altruism. *Amer. Econ. Rev.* 107 (11), 3617–3633.
- Rawls, J., 1971. *A Theory of Justice*. Harvard, Harvard University Press.
- Saito, K., 2013. Social preferences under risk: Equality of opportunity versus equality of outcome. *Amer. Econ. Rev.* 103 (7), 3084–3101.
- Schulz, J.F., Fischbacher, U., Thöni, C., Utikal, V., 2014. Affect and fairness: Dictator games under cognitive load. *J. Econ. Psychol.* 41, 77–87.