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RISK-TOLERANT WOMEN DONATE MORE THAN MEN: EXPERIMENTAL EVIDENCE OF DICTATOR GAMES.

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Risk-Tolerant Women Donate More than Men: Experimental Evidence of Dictator Games.

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Abstract

In a within-subjects experiment we test the relation of risk preferences and charitable giving. Women not only give substantially more than men, but also show an economically significant positive correlation between risk tolerance and donation levels. We find no such correlation for men. Men and relative risk-averse women do not differ in donations. Thus, common findings of gender differences in charitable giving may be explained by risk-tolerant women donating more.

JEL Classification numbers: C91, D64, D81, J16.

Keywords: Dictator Game, Experiment, Gender Differences, Risk Preferences.

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1 Introduction

Charitable giving is of particular importance in America. Annual data of 2014 point out that donations in the US amounted to $258.51 billions (Giving USA, 2015). Despite this evidence, many fundraising campaigns still face problems in motivating households to donate. Thus, it may be promising to study the motives of giving. Bekkers and Wiepking (2011) present a framework of eight mechanisms why people donate to charities. Our approach is motivated by one of these mechanisms – *efficacy* – as potential influencing factor for giving.[1]

In this paper we hypothesize that less risk-averse subjects give more to charities. We test this in experimental dictator games where subjects can donate to a charity. A special interest lies on gender differences in charitable giving. This is motivated by evidence in the field (Piper and Schnepf, 2008; Mesch et al., 2011) and in the lab (Eckel and Grossman, 1998; 2003) that women donate significantly more than men.

The idea that risk tolerance may correlate with donations is justified by the uncertain nature of efficacy aspects of charities. According to Bekkers and Wiepking (2011) perceived efficacy is influenced by multiple things. One aspect refers to donors' perception that contributions can make a difference to the cause supported by them (Duncan, 2004). This is emphasized by Borgloh et al. (2013) who find that subjects donate more frequently to small charities where perceived efficacy is high. Another issue is the utilization of the donated money. It is often uncertain to which extent donations reach the recipients. Related aspects are efficiency concerns of charities such as fundraising expenditures and overhead costs (Gneezy et al., 2014). Hence, donors who are more confident on charities' efficient organization may give more. Both aspects demonstrate the uncertain character of donating to charities and emphasize the importance of risk in the presence of efficacy concerns. Thus, we apply risk preferences as a proxy for subjects' attitude toward uncertainty.

In a within-subjects design we first elicit individual risk preferences with the investment task introduced by Gneezy and Potters (1997). Afterwards subjects can donate to the German "Red Cross" in a dictator game (e.g., Eckel and Grossman, 1998). We find a significant positive correlation between the risk tolerance of women and donation levels. Risk-tolerant women give substantially more than risk averse ones. Our regressions highlight for women that an one-Euro increase of the invest-

[1] The other seven mechanisms are: (a) awareness of need; (b) solicitation; (c) costs and benefits; (d) altruism; (e) reputation; (f) psychological benefits; (g) values.

ment in the risky gamble is associated with about one Euro higher donations.[2] By contrast, no correlation can be found when focusing on men. Indeed, average donation levels of men and risk-averse women do not differ. Thus, the gender difference in charitable giving is exclusively driven by risk-tolerant women.

2 Experimental Design

In our within-subjects experiment participants received the instructions before each stage started. They were told that they will not be informed on the outcome of the stages until the experiment was not finished. Subjects also knew that at the end of the experiment one out of the three stages would be randomly selected to be paid out. Subjects earned Taler and the exchange rate was 10 Taler = 1 Euro.

In the first stage we measured risk preferences with the investment task introduced by Gneezy and Potters (1997). Subjects had an endowment of 100 Taler and decided on the investment in a risky lottery. There was an equal chance that the lottery would win/lose. If the lottery wins, the invested amount is multiplied by 2.5. The investment is lost if the lottery does not win. The second stage was a dictator game (e.g., Eckel and Grossman, 1998). Participants had an endowment of 100 Taler and decided on the donation level to the German "Red Cross." They knew that the donations will be transferred by online transactions after the end of the experiment. Subjects were informed that they could stay and watch us doing the transaction. The third stage was a one-shot public good game which will be part of another study.[3] Afterwards, we elicited the Social Value Orientation (SVO) of our subjects following an unpaid method. The task consisted of nine decision sets with three choices each. Subjects were presented with fictional monetary splits between them and another hypothetical person.

Our experiments were programmed in z-Tree (Fischbacher, 2007) and subjects from various fields were recruited with ORSEE (Greiner, 2004). We ran three sessions with 24 subjects each. In total 72 subjects (40 women and 32 men) participated. One session lasted approximately 45 minutes. Subjects earned on average 12.12 Euros including a show-up fee of 2 Euros.

[2]This refers to the invested amount in Taler which was converted by an exchange rate (10 Taler = 1 Euro). In all stages subjects had an endowment of 100 Taler.

[3]In this study we will focus on the relation of risk preferences and cooperation.

3 Results

In this section we present our results and report two-sided p-values when applying statistical tests.

3.1 Dictator giving and risk preferences

Figure 1 shows average donations to the German Red Cross. The presentation is conditioned on male donors (left panel) and female donors (right panel).

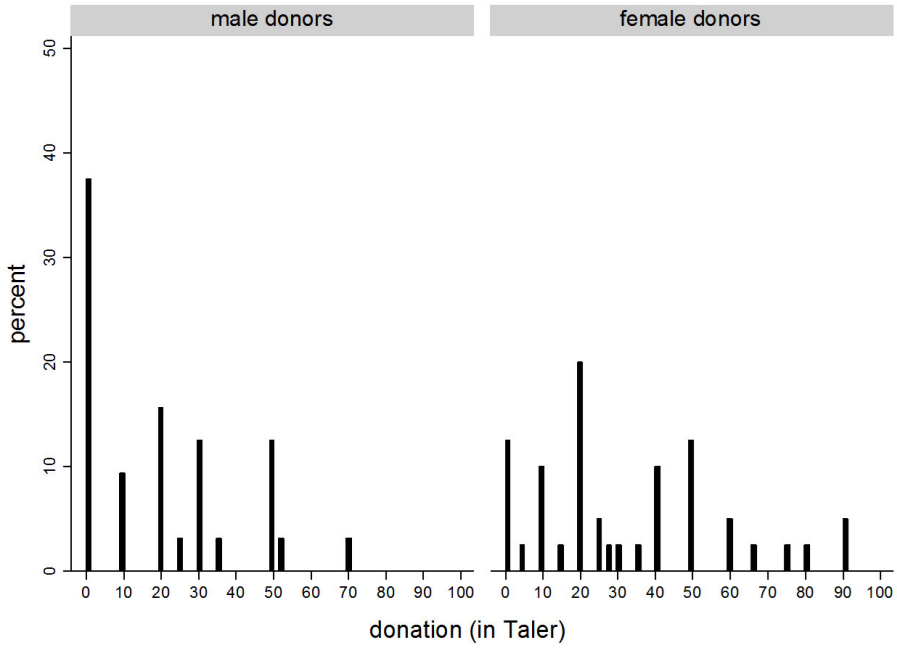

Figure 1: Donations of men and women in the dictator game.

Women donate significantly more (32.4) than men (19.8) (Mann-Whitney $p = 0.033$). The distribution of male donors is left censored, i.e., in most of the cases (38%) men give nothing. This case occurs significantly less frequently (13%) ($\chi^2(1) = 6.160,\ p = 0.013$) for women. Our data confirm the literature on gender differences in dictator games (e.g., Eckel and Grossman, 1998; 2003; Alevy et al., 2014).

Focusing on risk preferences, we find that women invest significantly less (31.48) in the risky gamble than men (56.19) (Mann-Whitney test, $p = 0.003$). The investment level of men is higher by 44% which confirms the findings on gender differences in risk preferences (Croson and Gneezy, 2009).

Result 1:

(a) Women donate significantly more than men.

(b) Women are significantly more risk averse than men.

We turn to our main question and study whether the risk preferences of men and women predict donation levels.

3.2 Main results

Figure 2 is a scatter plot illustrating the correlation of risk preferences and donations to the charity. The diagram is conditioned on the behavior of men (left panel) and women (right panel).

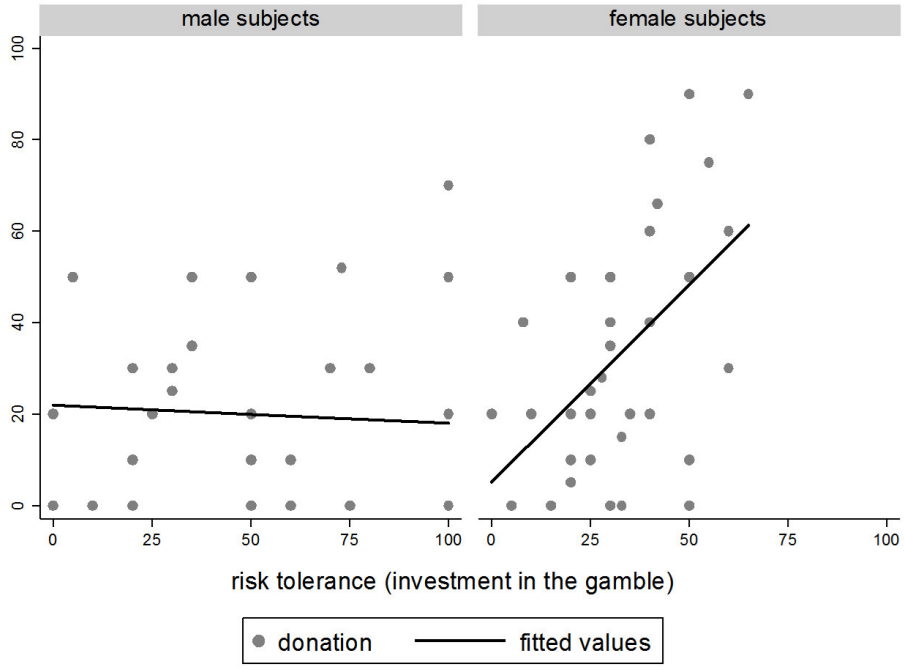

Figure 2: The relation of risk preferences and donations to the German Red Cross.

A conspicuous finding is the strong positive correlation between the risk preferences of women and donations. A Spearman's rank correlation coefficient is positive and highly significant ($\rho = 0.485$, $p = 0.002$), supporting the notion that more risk-tolerant women give more.[4] In strong contrast, men show no significant correlation

[4]This is confirmed by a Pearson's correlation coefficient ($\rho = 0.536$, $p < 0.001$).

between risk preferences and donations (Spearman's rank correlation coefficient: $\rho = -0.137,\ p = 0.454$).[5]

Next, we compare average donations of risk-averse and risk-tolerant women to men's donations. We split up the female distribution and categorize women in risk averse and risk tolerant. We classify women who invest ≤ 29 (> 29) as risk averse (risk tolerant).[6] The average donations of risk-averse women (19.00) are not significantly different from men's average donations (19.75) (Mann-Whitney test, $p = 0.773$). Strikingly, risk-tolerant women give significantly more (42.22) than all men (Mann-Whitney test, $p = 0.003$). This suggests that the gender difference in dictator giving is driven by risk-tolerant women.

Our results are in line with recent findings of Angerer et al. (2015). Motivated by theories of reciprocity they focus on more than 1,000 primary school kids to analyze how risk and intertemporal choices influence altruism. They find a non-linear relation between risk preferences and donations. We find similar results in our adult subject pool. By contrast, we aim to find explanations for the occurrence of common gender differences in donation behavior. Our findings suggest that this non-linear relation occurs as a result of the gender differences in our sample. Figure 2 would also show a u-shaped pattern, if we lay the low donations of very risk-tolerant subjects (see risk-tolerant men in the left panel) over the high donations of moderate risk-tolerant subjects (see risk-tolerant women in the right panel). To get a better understanding of the finding we present Tobit regression analyses.

Regression analyses

Table 1 presents tobit regressions on subjects' donation levels. In model (1) we add *female*, a dummy which is positive for female donors. *Risk* is the invested amount in the risky gamble. In model (1) only *female* is significant with a positive sign. Hence, women donate more to the charity. In model (2) we add the interaction term *female* $\times$ *risk*. Strikingly, we find that its coefficient is highly significant and positive. It follows for women, that an one-Euro increase of the investment in the risky gamble is associated with about one Euro more donated to the charity. This confirms the pattern of Figure 2. *Female* becomes insignificant, indicating that the

[5] This is confirmed by a Pearson's correlation coefficient ($\rho = -0.066,\ p = 0.720$).

[6] We find that 42.5% of the women invest less or equal 28, whereas 57.5% invest less or equal 30. Hence, we selected the mean of these investments (29) as threshold.

gender difference in donations can be entirely explained by less risk-averse women who give more.

	donation level					
	(1)		(2)		(3)	
female	20.301**	(7.664)	-18.364	(13.116)	-13.513	(12.917)
risk	0.111	(0.138)	-18.364	(13.116)	-0.057	(0.147)
female × *risk*			1.037***	(0.303)	0.936***	(0.292)
prosocial					24.627***	(0.147)
age					-0.050	(1.038)
econ					-0.322	(6.400)
constant	6.754	(9.283)	20.010**	(9.151)	-18.578	(25.414)
obs.	72		72		64	
Pseudo R^2	0.031		0.032		0.074	

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 1: Tobit regression on subjects' donation level. Standard errors in parentheses.

In model (3) we add control variables.[7] *Prosocial* is a dummy which is positive when subjects in the SVO task were classified as prosocial. We incorporate subjects' *age* and control whether participants are *econ* students. In model (3) we find that *female* × *risk* is highly significant with a moderately smaller coefficient. Thus, our main result is robust when adding controls. *Prosocial* is the only control which is significant with a positive coefficient. Hence, prosocial subjects give more. Since the proportion of prosocial women (67%) and men (68%) is almost identical, the gender difference in donations cannot be explained by differences in prosociality.

Result 2:

(a) Women show an economically significant and positive correlation between risk tolerance and donations.

(b) The gender difference in donations is entirely driven by risk-tolerant women.

[7] We had to drop eight observations because some subjects could not be classified in the SVO task.

4 Conclusion

Motivated by the idea that efficacy concerns may hinder charitable giving, we tested the relation of risk attitudes and donation behavior. We find clear evidence for an economically significant positive correlation between women's risk tolerance and charitable giving. The data show that the gender difference in donations can be entirely explained by risk-tolerant women. They give significantly more than men, whereas risk-averse women show the same behavior as men. The results may shed new light on established gender differences in charitable giving (e.g., Eckel and Grossman, 1998; 2003; Piper and Schnepf, 2008). Our findings suggest that attitudes toward uncertainty spurred by efficacy concerns may play an important role for charitable giving.

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Instructions to the experiment

You now participate in an experiment. Please stop talking with the other participants and switch off your cell phone. The experiment will consist of three different parts. In all of the three parts you will have to make several decisions. You will make your decisions without knowing the decisions of the other participants. Moreover, the other participants do not know your decisions while they are making their decisions. At the end of the experiment only one part will be paid out. After the end of the experiment a random draw will select the part to be payoff relevant. All three parts may be chosen with an equal probability. Please take your time to make the decisions. Note that all of your decisions will be anonymous.

In the experiment you will earn „Taler." At the end of the experiment your final payment will be determined by the amount of earned Taler.

The earned Taler will be converted at an exchange rate of:

10 Taler = 1 Euro

You will be paid out your earnings in cash after the end of the experiment.

Part 1

In part 1 you will find the following situation:

You have an endowment of 100 Taler which can be invested in a lottery.

The lottery wins or loses with a **probability of 50%**.

- If the lottery wins, your investment will be multiplied by 2,5.
- If the lotter loses, your investment will be lost.

Please note:

- You can only invest integers between 0 und 100 Taler.

If part 1 becomes payoff relevant, the computer will do a random draw which determines whether the lottery wins. The lottery will win with a probability of 50%.

In this case your payoff will be:

Not invested amount of the endowment + amount paid out by the lottery

You will receive the instructions for part two after you have made your decision in part one.

Part 2

In part two you have to decide on an allocation decision.

You have an endowment of 100 Taler. You are given the opportunity to donate Taler to the "German Red Cross." Therefore, you decide on the allocation of the endowment of **100 Taler** between **you and the recipient** ("German Red Cross").

Therefore, the following question will be displayed on the computer screen:

„Decide on the allocation of the 100 Taler between you and the German Red Cross."

I allocate to me: _____

I allocate to the German Red Cross: _____

Please note:

- You have to decide on the allocation of the entire *endowment* (100 Taler).
- You can only split integers (0-100 Taler).
- Your decision will remain anonymous after the end of the experiment.
- After the end of the experiment we will do an online transaction of the total sum of the donations to the German Red Cross. You are invited to stay and watch us doing the transaction.

If this part will be payoff relevant, then your payoff will equal the alloaction you dictated to you. At the same time the German Red Cross will exactly receive the amount you allocated to them.

You will receive the instructions for part three after you have made your decision in part two.

On-screen instructions of the SVO test (conducted after part three)

Imagine that another person was randomly matched with you. You do not know this person and you also know that you will not meet this person in the future. You and the other person will make decisions by selecting one of the numbers 1, 2 or 3.

Your own decision will lead to points for you and the other person. At the same time the decisions of the other person will also lead to points for you and for herself/himself. Each of these points is of value. The more points you receive, the better it is for you. The more points the other person receives the better it is for her/him.

In what follows you will find an example of how these exercises will work:

	1	**2**	**3**
You will get	500	500	550
The other person will get	100	500	300

In this example the following holds: If you choose “1”, you would get 500 points and the other person would get 100 points. If you choose “2”, you would get 500 points and the other person would also get 500. If you would choose “3”, you would get 550 points and the other person would get 300.

Thus, your decision and your own number of points also affects the other person’s number of points.

Before you make your decisions, bare in mind that there are no right and wrong answers. Just choose your most preferred option.

Keep in mind that the points are of value: The more you get the better. This also holds from the perspective of the other person: The more she/he gets the better,