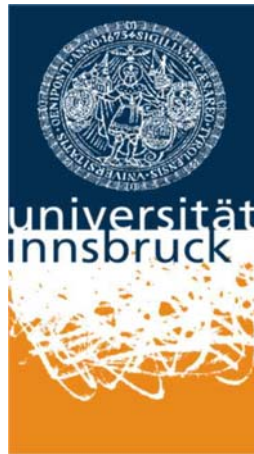


University of Innsbruck



**Working Papers
in
Economics and Statistics**

**Trust in cooperation or ability? An experimental
study on gender differences**

Christiane Schwieren and Matthias Sutter

2007-20

Trust in cooperation or ability? An experimental study on gender differences^{*}

Christiane Schwieren[#]

University of Heidelberg and SFB 504

Matthias Sutter

University of Innsbruck and University of Göteborg

Abstract: We examine gender differences in trust in another party's cooperation (CC) or its ability (AC). While men and women do not differ concerning trust in cooperation, gender has a strong influence when trust in another subject's ability is required.

JEL-classification: C72, C91

Keywords: trust, gender, experiment, cooperation, ability, stereotypes

^{*}Financial support from the Center of Experimental Economics at the University of Innsbruck (sponsored by *Raiffeisen Landesbank Tirol*) is gratefully acknowledged.

[#] Corresponding author. Address: Universität Heidelberg, Department of Economics – AWI, Grabengasse 14, 69117 Heidelberg, Germany. Email: christiane.Schwieren@awi.uni-heidelberg.de

1 Introduction

In this paper we address gender differences in an experimental trust game. We examine two different types of trust: trust in cooperation and trust in ability. Whereas the former type of trust has been studied extensively, the latter has not received careful examination yet, even though it is essential in many transactions, like when dealing with doctors, mechanics or fund managers (Dulleck and Kerschbamer, 2006).

So far, the evidence on gender effects in experimental trust-games is mixed: Croson and Buchan (1999) find no significant effect of gender on the trust of person *A*, i.e. the amount x sent to person *B*. However, women return significantly more in the role of person *B*. Chaudhuri and Gangadharan (2002) report men to be much more generous in the role of person *A* than women, but confirm Croson and Buchan's result for women in the role of person *B*. Scharlemann et al. (2001) note that the combination of the bargaining partners' gender plays a significant role. Some general findings on gender differences and stereotypes are used to explain behavioral differences in trust games (see Croson and Gneezy, 2004, for an overview of experimental research on gender differences). For instance, there is evidence that women are more relationship-oriented, and therefore react stronger to the behavior of others (Ortmann and Tichy, 1999). Women are also found to be more interested in a fair outcome (Eckel and Grossmann 1996). Women are (expected to be) more cooperative – or at least less competitive (e.g. Gneezy et al., 2003). The latter might induce *A*-players to send them less, expecting relatively high returns in any case, whereas the former should lead to higher amounts sent to them in the role of *B*. Another relevant factor might be status differences linked with gender stereotypes. Women are stereotypically of lower status than men and thus might expect to get less or be expected to be content with less (Ball et al. 2001, Schwieren, 2003), leading to lower amounts sent to them in the role of *B*. Men are assumed to

be more risk-taking than women and more keen on gambling.¹ If B-players hold this stereotype, they should expect to get more from men than from women in the role of A in both conditions. If differences in risk-taking are not only a stereotype, men in the role of A should send more money to B than women do.

With respect to abilities, we do not expect any gender differences in performance in the (mathematical) task we use, even if stereotypically men are better in mathematics than women. If such a stereotype prevails, we should expect men to be trusted more. This particular stereotype might be less pronounced among economics students, which is our main pool of subjects. Another stereotype might be more important: Female students are supposed to put more effort in fulfilling their tasks. Therefore, women might be expected to perform better than men and be trusted more.

2 Experimental design

We use two versions of a one-shot trust game (Berg et al., 1995) In both conditions subject A gets an initial endowment of $X = 10$ units of money. Subject B receives no initial endowment. In condition CC, first A passes over an amount $x \leq X$ to B. The amount x is multiplied by a constant $c = 3$, i.e. B receives $3x$. B can send back an amount $y \leq 3x$ to A, yielding final profits of $(X - x) + y$ for A, and $3x - y$ for B. In condition AC the constant c depends upon B's performance in a mathematical test. Performance in the top, middle or lowest tercile of B-participants implies $c = 5$, respectively $c = 3$ or $c = 1$. Hence, the average factor for multiplying the amount x sent by A is $c = 3$ as in CC. However, unlike in CC, the return y of subject B in AC is exogenously fixed as $y = cx/2$. This allows to disentangle trust in the bargaining partner's cooperation from trust in the bargaining partner's ability. It guarantees that subject A bases her decision only on the expected ability of the bargaining

¹ The empirical evidence on gender and risk-taking has produced mixed results though (Schubert et al., 1999, Dwyer et al. 2002, Croson and Gneezy, 2004)

partner, since it is profitable to send $x > 0$ if the partner's ability is at least in the middle tercile. There are two different sources of risk for person A in our two conditions: In CC, person A faces the risk of person B not sending back any money; in AC, person A faces the risk of person B performing below average in the ability test.

In each condition of the paper-and pen experiment, we have four different treatments, which we abbreviate by ff, fm, mf, mm , where $f(m)$ stands for female (male) and the first letter indicates the sex of subject A . The instructions for each condition were phrased in neutral terms. After having made their decision on x , A -subjects were asked to state their expectations about y . Subjects B in CC had to indicate their expectation on x before being informed about the real x . Then they had to decide on y . In AC, B -subjects started the experiment with the mathematical test. They were only told that their performance in the test would be positively correlated with their possible earnings in a two-person game. After the test, B -subjects got the instructions of AC, after which they were asked to state their expectation on x . Participants were informed about the gender of the subject in the other role by stating its first name. Nowhere else did we emphasize the role of gender in the game.

The experiment was run with 240 undergraduate students at the Universities of Maastricht and Innsbruck in December 2001 and January 2002. One unit of money was worth one Guilder in Maastricht and 0.5 € in Innsbruck.

3 Experimental results

Table 1 shows that both in CC and AC subjects transfer on average two thirds of their endowment to subject B . In CC, B -subjects return about one third of the tripled amount. The high correlation between subject A 's transfer x and subject B 's return y ($r = 0.76$; $p < 0.001$) is a clear sign of reciprocal behavior.

insert table 1 about here

B-subjects expect in both conditions a much lower transfer x from subjects *A* than they actually receive ($p < 0.01$; two-sided Mann-Whitney U-tests). *A*-subjects have rather precise expectations on the actual return of *B*-subjects in CC.²

The expected x -transfers differ significantly between our two conditions, with higher expected transfers in AC than in CC ($p < 0.01$; two-sided U-test). One might interpret this difference as arising from the exogenously determined return rate (of 0.5) in AC, which is significantly higher than the average actual return rate (of 0.34) in CC. *B*-subjects forced to return half of the disposable money might reasonably expect *A*-subjects to transfer larger amounts because the mandatory return rate provides a safety-belt against exploitation.

Table 2 reveals that male and female decision makers behave rather similarly in CC. Considering data across all treatments we find that gender or gender pairing does not cause any statistically significant differences concerning trust in cooperation.

insert table 2 about here

On average, female *B*-subjects return the largest amount to male *A*-subjects. However, the returns in *mf* are not significantly larger than in *fm* or *mm*, and only weakly significantly larger than in *ff* ($p = 0.083$; two-sided U-test). Relative returns $y/3x$ are significantly larger in *mf* than in *ff* ($p = 0.029$), weakly significantly larger in *mf* than in *fm* ($p = 0.056$), and not significantly different for any other pairwise comparison.

² *A*-subjects can state their expectation on y conditional on their chosen transfer x . This explains the high correlation between the transfer x and the expected return y ($r = 0.78$; $p < 0.001$).

Women send as much to men as to women and get back approximately the same amount from both. Men, however, send as much to women as women do, but get significantly more back from women. The reverse side is that women send significantly more back to men than to women. Women also send more back to men than men send back to women.

In condition AC female *B*-subjects performed on average slightly better than their male colleagues in the mathematical task, yielding an average of $c = 3.08$ for females, and $c = 2.88$ for males. In contrast to CC, we find a strong gender effect in AC regarding the transfer (see Table 3). Male *A*-subjects transfer about 30% more than female *A*-subjects ($p < 0.01$; two-sided U-test).

insert table 3 about here

Considering the four treatments, we find a significant treatment effect on the transfer decision ($p = 0.014$; Kruskal-Wallis-test). However, gender pairing *per se* (mixed-gender vs. same-gender) does not make a genuine difference. The following pairwise comparisons show statistically significant differences: Male *A*-subjects send more to female *B*-subjects than female *A*-subjects do (*mf* vs. *ff*; $p = 0.016$; two-sided U-test), and males send more to females than females send to males (*mf* vs. *fm*; $p < 0.01$; two-sided U-test).

Overall, the picture in AC tells us that male *A*-subjects trust more in the abilities of their partners by giving larger transfers than females do. We may also say that men are relatively more trusting when trust is relatively more rewarded, as it is in AC with its fixed return rate, which is higher than the return rate in CC (and in all other studies of the standard trust game).

4 Conclusion

In this paper, we have addressed the influence of gender on two different types of trust: trust in cooperation and trust in ability. Investigating the latter type of trust is – to the best of our knowledge – a novel feature of our paper.

We have not found any gender differences regarding trust in cooperation. This is a confirmation of the results of Croson and Buchan (1999), but is opposite to Chaudhuri and Gangadharan's (2002) result of men being more generous in the role of *A*-subjects. The only weakly significant gender effect is the fact that men get higher returns from women than women get from women. The latter result is evidence for more cooperative behavior in mixed-gender-pairings than in same-gender pairings.

Trust in ability has been found to be strongly influenced by gender: men trust more in the (mathematical) abilities of their interaction partners, in particular of women, than women do. This result may be explained by the stereotype of women investing more effort in a task than men do.

Another possible explanation concerns the relative price of trust. Andreoni and Vesterlund (2001) have shown that different behavior of men and women in bargaining games can be explained by women being more sensitive to the economic costs of being generous in bargaining. Women are more generous the more expensive generosity is. In our experiment, the relative price of trust differs between both conditions. In AC, showing trust is relatively cheaper (and less risky) since it guarantees a return rate of $cx/2$. Hence, the greater amount of trust (x) of men is compatible with the argument of Andreoni and Vesterlund (2001).

In summary, our paper has found different effects of gender when two different types of trust are analyzed. This suggests that the effects of gender on trust are too complex to be analyzed by the standard trust game of Berg et al. (1995) alone. Rather, trust has many facets that need more careful examination. Our paper has tried to disentangle the effects of gender on trust in cooperation versus trust in ability. Of course, we have focused on a very specific

ability, i.e. (relatively simple) mathematical skills, and this ability may have been partly confounded with effort. Therefore, it might be an interesting topic for future research to examine gender effects when other skills are crucial, like those of doctors, mechanics or fund managers.

References

- Andreoni, J., Vesterlund, L., 2001, Which is the fair sex? Gender differences in altruism. *Quarterly Journal of Economics* 116, 293-312.
- Ball, S., Eckel, C., Grossman, P. J., Zame, W., 2001, Status in markets. *Quarterly Journal of Economics* 116, 161-188.
- Berg, J., Dickhaut, J., McCabe, K., 1995, Trust, reciprocity, and social history. *Games and Economic Behavior* 10, 121-142.
- Chaudhuri, A., Gangadharan, L., 2002, Gender differences in trust and reciprocity, Mimeo, Washington State University.
- Croson, R., Buchan, N., 1999, Gender and culture: International experimental evidence from trust games, *American Economic Review, Papers and Proceedings*, 89, 386-391.
- Croson, R. Gneezy, U., 2004, Gender Differences in Preference, Mimeo.
- Dulleck, U., Kerschbamer, R., 2006, On doctors, mechanics and computer specialists – The economics of credence goods, *Journal of Economic Literature* 44, 3-41.
- Dwyer, P. D., Gilkeson, J. H., List, J. A., 2002, Gender differences in revealed risk taking: Evidence from mutual fund investors, *Economics Letters* 76, 151-158.
- Eckel, C. C., Grossman, P. J., 1996, The relative price of fairness: Gender differences in a punishment game, *Journal of Economic Behavior and Organization* 30, 143-158.
- Gneezy, U., Niederle, M., and Rustichini, A., 2003, Performance in competitive environments: gender differences, *Quarterly Journal of Economics* 118, 1049-1074.

- Ortmann, A., Tichy, L. K., 1999, Gender differences in the laboratory: Evidence from prisoner's dilemma games, *Journal of Economic Behavior and Organization* 39, 327-339.
- Scharlemann, J. P. W., Eckel, C. C., Kacelnik, A., Wilson, R. K., 2001, The value of a smile: Game theory with a human face, *Journal of Economic Psychology* 21, 617-640.
- Schubert, R., Brown, M., Gysler, M., Brachinger, H. W., 1999, Financial decision-making: Are women really more risk-averse? *American Economic Review, Papers and Proceedings* 89, 381-385.
- Schwieren, C., 2003, The gender wage gap - due to differences in efficiency wage effects or discrimination? METEOR Discussion Paper, University of Maastricht.

Tables:

Table 1. Average decisions

	CC	N	AC	N
x (transfer of A in units)	6.57	59	6.89	61
y (return of B in units)	7.42	59	$cx/2$	
$y/3x$	0.34	59	-	
Profit A	10.85	59	13.64	61
Profit B	12.29	59	10.89	61
expected x (by subject B) [§]	3.32	49	4.75	51
expected y (by subject A) [§]	6.66	56	-	
expected $y/3x$ (by subject A) [§]	0.29	56	-	

[§] Subjects were allowed to state no expectation.

Table 2. The influence of gender in CC

	decision maker		treatments			
	male	female	ff (N=16)	fm (N=16)	mf (N=13)	mm (N=14)
x (transfer of A in units)	6.57	6.56	6.75	6.38	7.15	6.04
y (return of B in units)	6.82	8.03	6.53	7.01	9.88	6.61
$y/3x$	0.31	0.37	0.31	0.30	0.45	0.33
profit A	11.61	10.21				
profit B	11.83	12.76				
expected x (by subject B)	3.77	2.86	2.10	3.07	3.75	4.46
expected y (by subject A)	7.02	6.32	4.23	7.96	6.45	7.50
expected $y/3x$ (by subject A)	0.39	0.30	0.22	0.36	0.23	0.32

Table 3. The influence of gender in AC

	decision maker		Treatment			
	male	Female	ff (N=15)	fm (N=18)	mf (N=14)	mm (N=14)
x (transfer of A in units)	7.88	6.06	6.30	5.86	8.50	7.25
c (multiplication of x)	2.88	3.08				
Profit A	16.66	11.09				
Profit B	9.69	12.22				
expected x (by subject B)	4.25	5.26	5.04	4.43	5.50	4.00

University of Innsbruck – Working Papers in Economics and Statistics

Recent papers

- 2007-20 **Christiane Schwieren and Matthias Sutter:** Trust in cooperation or ability? An experimental study on gender differences.
- 2007-19 **Matthias Sutter and Christina Strassmair:** Communication, cooperation and collusion in team tournaments – An experimental study.
- 2007-18 **Michael Hanke, Jürgen Huber, Michael Kirchler and Matthias Sutter:** The economic consequences of a Tobin-tax – An experimental analysis.
- 2007-17 **Michael Pfaffermayr:** Conditional beta- and sigma-convergence in space: A maximum likelihood approach.
- 2007-16 **Anita Gantner:** Bargaining, search, and outside options. *Revised version forthcoming in: Games and Economic Behavior.*
- 2007-15 **Sergio Currarini and Francesco Feri:** Bilateral information sharing in oligopoly.
- 2007-14 **Francesco Feri:** Network formation with endogenous decay.
- 2007-13 **James B. Davies, Martin Kocher and Matthias Sutter:** Economics research in Canada: A long-run assessment of journal publications. *Revised version forthcoming in: Canadian Journal of Economics.*
- 2007-12 **Wolfgang Lohan, Martin Kocher and Matthias Sutter:** Group polarization in the team dictator game reconsidered. *Revised version forthcoming in: Experimental Economics.*
- 2007-11 **Onno Hoffmeister and Reimund Schwarze:** The winding road to industrial safety. Evidence on the effects of environmental liability on accident prevention in Germany.
- 2007-10 **Jesus Crespo Cuaresma and Tomas Slacik:** An “almost-too-late” warning mechanism for currency crises.
- 2007-09 **Jesus Crespo Cuaresma, Neil Foster and Johann Scharler:** Barriers to technology adoption, international R&D spillovers and growth.
- 2007-08 **Andreas Brezger and Stefan Lang:** Simultaneous probability statements for Bayesian P-splines.
- 2007-07 **Georg Meran and Reimund Schwarze:** Can minimum prices assure the quality of professional services?.
- 2007-06 **Michal Brzoza-Brzezina and Jesus Crespo Cuaresma:** Mr. Wicksell and the global economy: What drives real interest rates?.
- 2007-05 **Paul Raschky:** Estimating the effects of risk transfer mechanisms against floods in Europe and U.S.A.: A dynamic panel approach.
- 2007-04 **Paul Raschky and Hannelore Weck-Hannemann:** Charity hazard - A real hazard to natural disaster insurance.
- 2007-03 **Paul Raschky:** The overprotective parent - Bureaucratic agencies and natural hazard management.
- 2007-02 **Martin Kocher, Todd Cherry, Stephan Kroll, Robert J. Netzer and Matthias Sutter:** Conditional cooperation on three continents.
- 2007-01 **Martin Kocher, Matthias Sutter and Florian Wakolbinger:** The impact of naïve advice and observational learning in beauty-contest games.

University of Innsbruck

Working Papers in Economics and Statistics

2007-20

Christiane Schwieren and Matthias Sutter

Trust in cooperation or ability? An experimental study on gender differences

Abstract

We examine gender differences in trust in another party's cooperation (CC) or its ability (AC). While men and women do not differ concerning trust in cooperation, gender has a strong influence when trust in another subject's ability is required.

ISSN 1993-4378 (Print)

ISSN 1993-6885 (Online)