

Gender Differences in Social Framing Effects

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Abstract: In a one-shot Prisoners' dilemma experiment, female participants are highly sensitive to the social frame. Male participants are not. Additional evidence suggests that the operative gender difference is in beliefs, not preferences.

Key words: Social Dilemma, Prisoner's Dilemma, Gender, Experiments

JEL classification: H41, C90, C91, J16

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1. Introduction

A large literature studies gender differences in the propensity to cooperate in social dilemmas. Results are mixed. Sometimes men cooperate more, sometimes women cooperate more, and sometimes there is no difference.¹ In their recent literature survey on gender differences in preferences, Croson and Gneezy (2009, page 464) argue that the mixed evidence arises because women care more about the context than men do: “Participants of both genders are likely maximizing an underlying utility function, but the function that men use is less sensitive to the conditions of the experiment, information about the other party, and (even) the other party’s actions, than the function that women use.” Similar views have previously been articulated less formally by social psychologists; see for example Kahn, Hottel, and Davis (1971), Gilligan (1982) and the references therein.

Here, we present new experimental evidence in support of the view that women respond more strongly to context than men do. However, we suggest that it is not women’s *social preferences* that are more sensitive to context, but their *social beliefs*. Our evidence comes from two experiments, first described in our previous work Ellingsen et al. (2012). There, we report that subjects cooperate more in a one-shot Prisoners’ dilemma when it is labeled a “Community Game” than when it is labeled a “Stock Market Game”.² We also report that the difference vanishes when the two players make decisions sequentially rather than simultaneously.³ That is, context only matters when both players are uncertain about what the opponent will do.

In our previous article, we did not report data on gender, because they were incomplete.⁴ Despite this shortcoming, we think that the data are worth considering, as they bear so directly on the hypothesis that women’s behavior is more sensitive to context. Indeed, we find that virtually all the social framing effect is due to the female subjects.

¹ See, for example, Croson and Gneezy (2009, Section 3.4).

² The experimental design is heavily inspired by Liberman, Samuels and Ross (2004). For extensive references to the literature on social framing effects, see Ellingsen et al. (2012).

³ Here we only discuss the experimental treatments that are relevant for the questions asked in this paper. For a complete overview of all experimental treatments in the original experiment, see Ellingsen et al. (2012).

⁴ Due to an implementation error we failed to collect gender data in some of the sessions.

2. Experimental Design and Implementation

Participants were randomly divided between four different rooms and each subject was, anonymously and randomly, paired with a participant in another group. In oral and written instructions, subjects were presented with the Prisoners' dilemma payoff matrix in Figure 1, where numbers denote the payoff in Swedish Kronor.⁵

[Table 1 about here]

Experiment 1

In Experiment 1, the subject and the matched partner were instructed to simultaneously submit their choice of either action A or action B.⁶

The instructions that subjects received were identical, except for how the game was labeled. In two rooms, the situation was called the "Stock Market Game" (Treatment 1) whereas in the other two rooms it was called the "Community Game" (Treatment 2). This design allows us to investigate whether the fraction of cooperative choices is different between the two treatments. Using data on participants' gender, we can furthermore examine whether there are differences between how women and men react to the frame.

Experiment 1 was conducted at Södertörn University College and Stockholm School of Economics, which are both located in Stockholm, Sweden, on two different occasions (Södertörn in April 2006 and Stockholm School of Economics in September 2007). A total of 174 subjects participated. They were all freshmen and enrolled in a basic microeconomics course.⁷

⁵ At the time of the experiment 1USD corresponded to SEK 7.50.

⁶ See Appendix 1 (not intended for publication) for full instructions.

⁷ A third session with 54 participants was also conducted, during which no data on the participant's gender was collected. The results on aspects not involving gender are not sensitive to the inclusion or exclusion of these additional 54 observations.

Experiment 2

Experiment 2 is similar to Experiment 1, except now the participants move sequentially.⁸ One subject in the pair moves first, and the other subject can condition her action on that first move. We use the strategy method to elicit the choice of second-movers.

This experiment was conducted in September 2009. In total, 272 subjects participated. All were freshmen enrolled in a basic microeconomics course at Stockholm School of Economics.

3. Results and Discussion

Figure 1 displays the social framing effect in Experiment 1.

[Figure 1 about her]

There is significantly less cooperation in the “Stock Market Game” than in the “Community Game”. In the former case, the fraction of cooperative choices is 25.0 percent (N=88) compared to 41.9 percent (N=86) in the latter. This difference of 16.9 percentage points is highly statistically significant ($p=0.018^9$).

Now consider the results broken down by gender. Figure 2 reveals that men and women react differently to the social frames. Women have a cooperation rate of 27.1 percent under the “Stock Market” frame (N=48) compared to 60.5 percent (N=38) under the “Community Game” frame. The difference of 33.4 percentage points is highly statistically significant ($p=0.002$). For men however, there is no significant difference ($p=0.62$) between the cooperation rate under the “Stock Market” frame (22.5 percent, N=40) and the “Community” frame (27.1 percent, N=48).

[Figure 2 about her]

Furthermore, we have enough statistical power to conclude that the difference in the absolute social framing effect for women and men (the “diff-in-diff”) is statistically significant ($p=0.039$).

⁸ See Appendix 2 (not intended for publication) for full instructions.

⁹ All p-values are two-sided and are derived from OLS-regressions; standard errors are robust. None of the results are markedly different if a probit model is used instead of OLS.

Clearly, a study investigating gender differences in behavior in social dilemmas would only were to apply the Community frame would come to a rather different conclusion than a study only applying the Stock Market frame. In the former case, one would conclude that women are more cooperative than men ($p=0.002$); in the latter case one would conclude that there is no significant difference ($p=0.63$). Indeed, a difference-in-differences analysis reveals that the gender difference is significantly larger under the Community frame than under the Stock Market frame ($p=0.04$).

While it is tempting to conclude that women must have a stronger preference for cooperation under the Community frame than under the Stock Market frame, there is another possibility: They want to match the opponent's behavior, and they find it more likely that the opponent cooperates under the Community frame. Experiment 2 was designed to investigate this possibility.

Briefly put, Experiment 2 shows that there are no significant differences between the genders when the game is played sequentially. The second-movers' strategies are depicted in Figure 3.

Figure 3 about here

Since we apply the strategy method, second movers have access to four strategies. Strategy CC denotes unconditional cooperation (action A regardless of the first mover's choice). Strategy CD denotes conditional cooperation (action A if opponent picks A, action B if opponent picks B). Strategy DD denotes unconditional defection (action B regardless of opponent's choice, and strategy DC denotes reverse conditional cooperation (B if opponent picks A, A if opponent picks B). To the extent that frames affect preferences, we would expect unconditional and conditional cooperation to be greater under the Community frame than the Stock Market frame. As is clear from the figure, this hypothesis certainly does not hold for men; if anything, the opposite is true. For women, there is some evidence in the hypothesized direction, but the magnitude is small and far from being statistically significant.

4. Conclusion

In a simultaneous Prisoners' dilemma, we find that women are considerably more sensitive to social framing than men are. However, this does not imply that the social frame shapes women's

desires. Instead, the lack of a framing effect in the sequential Prisoners' dilemma suggests that the frame may be shaping beliefs in a self-fulfilling way: Women cooperate more in the Community game than in the Stock Market game because they believe that others will do so. Incidentally, this interpretation is in line with previous findings that women are better at coordinating in some games with multiple equilibria, notably in threshold public good games (Cadsby and Maynes, 1998 and Croson et al., 2008).

Of course, the experiment does admit other interpretations. For example, we cannot exclude the possibility that the frame affects preferences in the simultaneous setting but not in the sequential setting. But at the very least, the research is a reminder that behavior is not only driven by preferences, and that gender gaps could be a function of different understandings as well as different goals.

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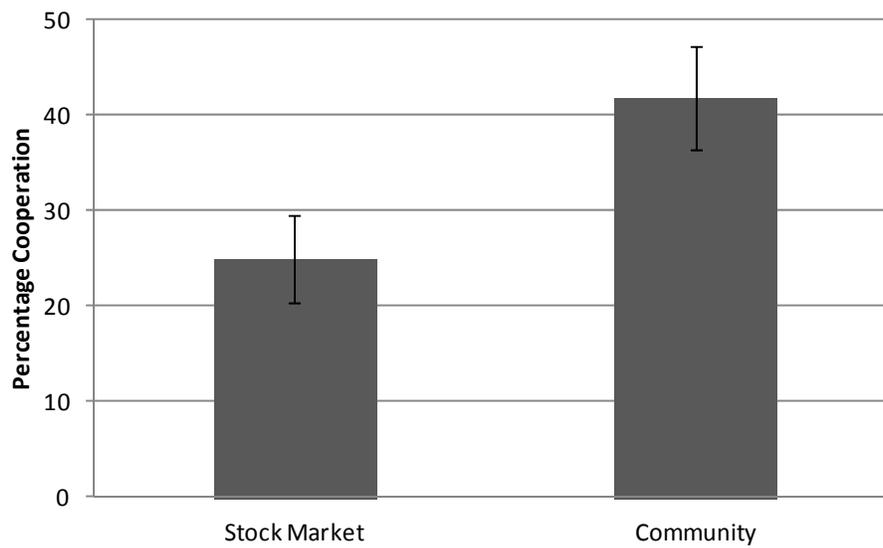
Tables and Figures

Table 1: The monetary payoffs

	A	B
A	50 , 50	5 , 80
B	80 , 5	20 , 20

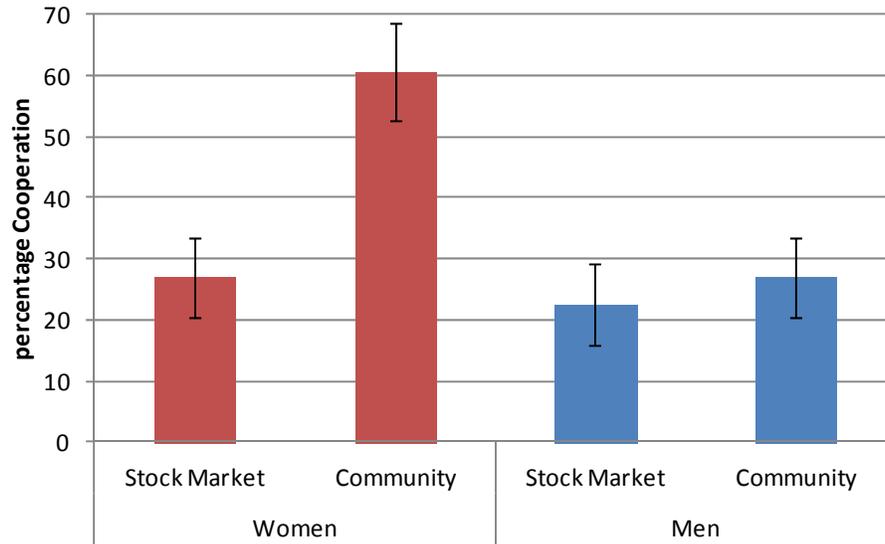
** Player 1's actions and payoffs are bold*

Figure 1: The Social Framing Effect under Simultaneous Moves



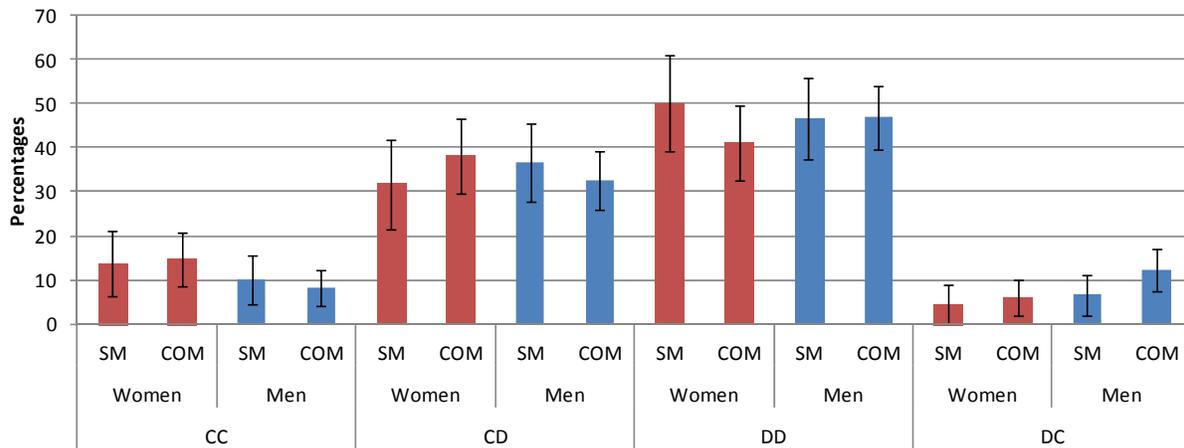
** Bars denote the standard error of the mean*

Figure 2: The Social Framing Effect under Simultaneous Moves – by Gender



** Bars denote the standard error of the mean*

Figure 2: The Social Framing Effect Second Mover – By Gender



** Bars denote the standard error of the mean. SM=Stock Market, COM=Community*

Appendix 1: Instructions for Experiment 1¹⁰

Stock Market Game [Community Game], instructions

Hi and welcome. You are going to take part in the **Stock Market Game [Community Game]**. For your participation you will get compensation. This compensation is dependent on the choices you make.

Please read the instructions carefully. If you have any questions, please raise your hand and the experimenter will come and help you. Do not ask questions without raising your hand first. It is also important that you do not speak to the other participants while the experiment is taking place.

In the Stock Market Game [Community Game] you are paired up with a person in another room. You will not get any information about who that person is, neither before nor after the experiment. The other person will not get information about your identity either.

All people in this room and all people in the other room get the same instructions and compensations for taking part in the experiment.

The Stock Market Game [Community Game] looks like this:

Stock Market Game [Community Game]

		You	
		A	B
The other person	A	50 50	5 80
	B	80 5	20 20

You and the other person choose simultaneously between A and B. Depending on your respective choices, you end up in one of the four squares in the matrix above. The bold numbers in the upper right corner represents, in Swedish kronor, what you get and the numbers in the lower left corner represents what the other person gets.

Examples:

- If both you and the other person choose A you both get 50 kronor.
- If both you and the other person choose B you both get 20 kronor.

¹⁰ This Appendix is not intended for publication.

- If you choose A and the other person chooses B you get 5 kronor and the other person gets 80 kronor.
- If you choose B and the other person chooses A you get 80 kronor and the other person gets 5 kronor.

Please note that you will not know anything about the decision of the other person when you make your decision.

Write your decision on the form marked “answering form”. Then turn the form upside-down and put it in front of you.

When the Stock Market Game [Community Game] is finished, the experimenter will compile the results and prepare an envelope for each participant. These envelopes will then be distributed. The envelope will contain information about how the other person decided and what the result of the game was. The sum you are allotted will also be in the envelope.

Thank you for your participation!

Appendix 2: Instructions for Experiment 2¹¹

Stock Market Game [Community Game], instructions

Hi and welcome. You are going to take part in the **stock market game [community game]**. For your participation you will get compensation. This compensation is dependent on the choices you make.

Please read the instructions carefully. If you have any questions, please raise your hand and the experimenter will come and help you. Do not ask questions without raising your hand first. *It is also important that you do not speak to the other participants while the experiment is taking place!*

In the stock market game [community game] you are paired up with a person in another room. The persons in one of the rooms are called player 1 and the persons in the other room are called player 2. You and everyone else in your room are **player 1 (2)**. You will not get any information about who the person in the other room is and he/she will not get any information about your identity, neither before nor after the experiment. All the persons in both rooms have received these instructions.

The stock market game [community game] looks like this:

Stock Market Game [Community Game]

		You	
		A	B
The other person	A	50	50
	B	5	20

Player 1 first chose between A and B without knowing which choice player 2 will make. Thereafter player 2 chooses between A and B, given that she knows which choice player 1 has made. The bold numbers in the upper right corner represents, in Swedish kronor, what player 1 get and the numbers in italics in the lower left corner represents what player 2 gets.

Examples:

- If both player 1 and player 2 choose A you both get 50 kronor.

¹¹ This Appendix is not intended for publication.

- If both player 1 and player 2 choose B you both get 20 kronor.
- If player 1 choose A and player 2 choose B, player 1 get 5 kronor and player 2 gets 80 kronor.
- If player 1 chooses B and player 2 choose A, player 1 get 80 kronor and player 2 gets 5 kronor.

Player 1 write down their choice on the form marked “answering form (player 1)” and player 2 write down their choice on the form marked “answering form (player 2)”. Player 2 writes down their choice both for the case when player 1 chose A and for the case when player 1 chose B (the choice of player 2 for the choice actually made by player 1 will then be used to determine the payments). When you have made your choice, turn the form upside-down and put it in front of you.

The experimenters then collect the forms in both rooms and prepare an envelope for each participant that contains the payment of each participant. These envelopes will then be distributed and the experiment is then over.

Thank you for your participation!