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**Gender-specific inclinations in a Cooperation Game  
- Implications for Negotiations**

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## **Executive summary**

This study explores possible gender-specific inclinations, specifically inclinations for cooperation, fairness, discrimination, risk taking and sex stereotyping, all potentially fundamental to negotiation outcomes. The aim is that the findings may provide insight in observed gender inequality in organizational life. Participants in the study were engaged in matrix games with a Prisoners' Dilemma-like payoff structure, but with variable degrees of possible cooperation. The games were played with the strategy method and all participants played against both women and men. The results showed no significant differences in level of cooperation between the sexes. Neither were there any significant differences in fairness or discrimination of or by either sex in the games. However, men were found to be more prone to taking risks compared to women, and both female- and male participants believed that men would take higher risks in the games. Differences in risk propensity may help explain why men do better in negotiations in organizational life, as men would be more inclined than women to enter risky negotiations and taking risks in negotiations. Thus policies aimed at lowering the risk of becoming unemployed, paired with policies to lower the risk of initiating salary negotiations, could potentially contribute to increased gender equality in organizational life.

Keywords: Gender inclinations, cooperation, discrimination, risk, sex stereotyping, matrix games, negotiations.

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# 1. Introduction

Through negotiation, two or more agents can structure economic and social contracts and transactions, and resolve conflicts. Without the calculated possibility of creating value, at least for herself, no rational economic agent would enter a negotiation. Thus, negotiation can be described as a means for agents, on an individual as well as on an aggregated level, to acquire material and/or non-material resources, with status and power being the most prominent. In organizational life, women have less access to resources than men do. The wage gap and the glass ceiling phenomena are ample evidence of this (Gerhart & Rynes, 1991; Wood, Corcoran & Courant, 1993).<sup>1, 2</sup> To create an understanding of what is causing these phenomena, it could potentially help to analyze how women and men behave in negotiations. If there are significant gender differences in negotiation behavior, then knowledge of the respective behavior could serve as a basis for gender equalizing corporate and governmental policy.

This study is meant to complement the numerous, but mostly non-conclusive, studies on the effect of gender in negotiations. The goal of this research is to explore if gender differences exist in negotiation behavior and explain the underlying traits of the differences if they do, in fact, exist. Specifically, this research will explore the existence of: (a) a gender-linked propensity to cooperate; (b) a gender-linked propensity for fairness; (c) a gender-linked propensity to discriminate; (d) a gender-linked propensity for risk; and (e) a gender-linked propensity for sex stereotyping. The complex nature and the broad definition of negotiations make it highly difficult to accurately reproduce such interactions in a single, quantitative experiment. On the other hand, observing case negotiations or real-life negotiations is a time consuming alternative, and variables other than gender would possibly pose interference to the research. The method chosen in this research, is a complimentary study that aims to capture the above specified aspects of negotiations, through a quantitative experiment building on findings from previous research, in order to give a more complete picture of the subject.

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<sup>1</sup> Gerhart, B, & Rynes, S. (1991). Determinants and consequences of salary negotiations by male and female MBA graduates.

<sup>2</sup> Wood, R. G., Corcoran M. E. & Courant, P. N. (1993). Pay Differences among the Highly Paid: The Male-Female Earnings Gap in Lawyers' Salaries.

The experiment in this study is a matrix game played with the strategy method (Selten, 1967), influenced by a Public Goods experiment (Fischbacher, Gächter & Fehr, 2000) but now played with two players instead of four.<sup>3, 4</sup> This way, the game holds the same strategic structure as the Prisoner's Dilemma, but with variable degrees of cooperation. The decision situations in the game were framed as an investment and structured so that all, in economic terms, perfectly rational and selfish players were predicted to make zero investments according to standard theory. The experiment was meant to capture the more complex nature of integrative negotiations regarding fairness, discrimination, risks and voluntary concessions to a common project with an uncertain yield. It was not meant to elicit negotiation effectiveness. Previous gender studies on the subject concern the distributive bargain aspect of negotiations and are mostly conducted with Ultimatum and Dictator games, with no possibility to enlarge the pie.<sup>5</sup> These previous approaches are in themselves more competitive than collaborative. The possible mutual benefit from cooperation, the prospect of enlarging the pie, is captured in this experiment as the option to invest in a common project.

Evidence from previous research on cooperativeness and sex differences (see for example Eagly & Johnson, 1990, and Walters et al, 1998), studies on fairness preferences (see for example Rabin, 1993, and Andreoni & Vesterlund, 2001) studies on discrimination in negotiations (Solnick and Schweitzer, 1999, and Holm, 1998) studies on risk attitudes (see for example Eckel et al, 2008), and studies on gender stereotypes (see for example Matheson, 1991, and Watson, 1994), suggest that women are more cooperative and fair than men, that both sexes discriminate against women, that women are less prone to risks than men, and that

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<sup>3</sup> Selten, (1967). Die Strategiemethode zur Erforschung des eingeschränkt rationalen Verhaltens im Rahmen eines Oligopolexperiments.

<sup>4</sup> Fehr, E., Fischbacher, U. & Gächter, S. (2000). Are People Conditional Cooperative? Evidence from a Public Goods Experiment

<sup>5</sup> Walters, A., Stuhlmacher, A. S., & Meyer, L. L., (1998). Gender and Negotiator Competitiveness: A Meta-analysis.

men are believed to be more prone to risks compared to women.<sup>6, 7, 8, 9, 10, 11, 12, 13, 14</sup> It is thus predicted that the experiment will show that women behave more cooperatively than men (hypothesis 1), that women are more egalitarian than men (hypothesis 2), that women are discriminated against to a higher extent than men (hypothesis 3), that women are less prone to risks than men (hypothesis 4), and that men are believed to be more prone to risks compared to women (hypothesis 5).

The results showed that:

- There were no significant differences in level of cooperation between the sexes.
- There were no significant differences in fairness between the sexes.
- There was no significant discrimination of or by either sex.
- Men were significantly more prone to taking risks compared to women, when cooperating with either of the sexes.
- Both female- and male participants believed that men would be more prone to taking risks than women.

Section 2 provides the results of previous research and links to this study; section 3 offers a theoretical explanation of the experiment and this research; section 4 presents the data used in the experiment; section 5 describes the method of the experiment; section 6 details the results; and section 7 discusses the results and presents conclusions from the research.

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<sup>6</sup> Eagly, A. H., & Johnson, B. T. (1990). Gender and leadership style: A meta-analysis

<sup>7</sup> Walters, A. E., Stuhlmacher, A. F. & Meyer, L. L., (1998). Gender and Negotiator Competitiveness: A Meta-analysis

<sup>8</sup> Rabin, M. (1993). Incorporating Fairness Into Game Theory and Economics.

<sup>9</sup> Andreoni, J. & Vesterlund, L. (2001). Which is the Fair Sex? Gender Differences in Altruism.

<sup>10</sup> Matheson, K. (1991). Social cues in computer-mediated negotiations: Gender makes a difference.

<sup>11</sup> Watson, C. (1994). Gender versus power as a predictor of negotiation behavior and outcomes.

<sup>12</sup> Solnick, S.J., Schweitzer, M. E., (1999). The Influence of Physical Attractiveness and Gender on Ultimatum Game Decisions.

<sup>13</sup> Holm, H. J., (2000). Gender-Based Focal Points

<sup>14</sup> Eckel, C., Oliveira, A. C. M. & Grossman, P. J. (2008). Gender and Negotiation in the Small: Are Women (Perceived to Be) More Cooperative than Men?

## 2. Previous research

A substantial amount of studies have aimed to explain gender differences in negotiations. Although the results are inconclusive, a majority of the studies found women slightly less competitive and more cooperative than men. However, no clear, definite conclusions have been made on gender differences in the underlying behavioral traits that determine the outcome of negotiations. Gender differences in propensity for: cooperation, fairness, discrimination, risk taking and sex stereotyping, traits that are fundamentally determining factors to the outcome of negotiations, have not been rigorously explored. These behavioral traits are thus also fundamental to the understanding of the observed differences in outcome of negotiations in organizational life.

### 2.1 Cooperativeness

The findings of previous literature are quite inconsistent. Some studies have found women to be less cooperative negotiators than men (e.g. Oskamp & Pearlman, 1965; Bedell and Sistrunk, 1973; Hottes & Kahn, 1974), while other literature has found women more cooperative than men (e.g., Fisher & Smith, 1969; Tedeschi, Bonoma, & Lindsfold, 1970; Conrath, 1972; Kimmel, Pruitt, Magenau, Konar-Goldband, & Carnevale, 1980; Scudder, 1988).<sup>15, 16, 17, 18, 19, 20, 21, 22</sup> Two meta-analyses of gender and cooperativeness from the mid-1970s found that most studies concluded that women are more cooperative than men, but a large portion of the studies analyzed drew the opposite conclusion (Maccoby and Jacklin, 1974; Rubin and Brown, 1975). Some studies did not find any significant behavioral

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<sup>15</sup> Oskamp, S., & Perlman, D. (1965). Factors affecting cooperation in a Prisoner's Dilemma game.

<sup>16</sup> Bedell, J., & Sistrunk, F. (1973). Power, opportunity costs, and sex in a mixed-motive game.

<sup>17</sup> Hottes, J. H., & Kahn, A. (1974). Sex differences in a mixed-motive conflict situation.

<sup>18</sup> Fisher, R., & Smith, W. P. (1969). Conflict of interest and attraction in the development of cooperation.

<sup>19</sup> Tedeschi, J. T., Bonoma, T., & Lindsfold, S. (1970). Threateners' reactions to prior announcement of behavioral compliance or defiance.

<sup>20</sup> Conrath, D. W. (1972). Sex role and "cooperation" in the game of chicken.

<sup>21</sup> Kimmel, M. J., Pruitt, D. G., Magenau, J. M., Konar-Goldband, E. K. (1980). Effects of trust, aspiration, and gender on negotiation tactics.

<sup>22</sup> Scudder, J. N. (1988). The influence of power on powerful speech: A social-exchange perspective.



difference on the subject (Ferguson & Schmitt, 1988; Grant & Sermat, 1969; Horai & Tedeschi, 1975; Watson & Hoffman, 1996).<sup>23, 24, 25, 26, 27, 28</sup>

Watson (1994) and Camras (1994) both support the notion of a more competitive man and suggest that this is due to gender-role socialization.<sup>29, 30</sup> Camras (1994) support the claim with the finding that when kids advance in age, they use more gender-typical negotiation strategies.<sup>31</sup> Rubin and Brown (1975) and Tannen (1995) argue according to the same line of thought, when giving an interpretation of the heterogeneous results found in research on gender and competitiveness. Men are suggested to be less interpersonal-oriented and more goal-oriented than women. This suggests that men are more competitive bargainers than women when a competitive approach is more profitable.<sup>32, 33</sup> In a review of previous studies, the researchers found that a significant portion of the research that pointed to females being the more competitive gender were constructed under conditions where a competitive approach would most likely not maximize profit. More recent, and perhaps the most extensive, research on gender and negotiator cooperativeness is a meta-analysis from 1998 (Walters et al 1998).<sup>34</sup> The meta-analytic review, including results from 62 research reports, measured the relative gender-competitiveness behavior. Women showed a slight inclination to behave more cooperatively than men. However, in a strategic environment where the opponent played “tit-for-tat” (copying behavior, where the player cooperates if the opponent

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<sup>23</sup> Maccoby, Eleanor E.; Jacklin, Carol N. (1974). *The psychology of sex differences*

<sup>24</sup> Rubin, J. Z., & Brown, B. R. (1975). *The social psychology of bargaining and negotiation*

<sup>25</sup> Ferguson, E. D., & Schmitt, S. (1988). Gender-linked stereotypes and motivation affect performance in the Prisoner's Dilemma Game.

<sup>26</sup> Grant, M. J., & Sermat, V. (1969). Status and sex of other as determinants of behavior in a mixed motive game.

<sup>27</sup> Horai, J., & Tedeschi, J. T. (1975). Compliance and the use of threats and promises after a power reversal.

<sup>28</sup> Watson, C., & Hoffman, L. R. (1996). Managers as negotiators: A test of power versus gender as predictors of feelings, behavior, and outcomes.

<sup>29</sup> Watson, C. (1994). Gender versus power as a predictor of negotiation behavior and outcomes.

<sup>30</sup> Camras, L. A. (1984). Children's verbal and nonverbal communication in a conflict situation.

<sup>31</sup> *Ibid.*

<sup>32</sup> Rubin, J. Z., & Brown, B. R. (1975). *The social psychology of bargaining and negotiation*.

<sup>33</sup> Tannen, D. (1990). *You just don't understand: Women and men in conversation*.

<sup>34</sup> Walters, A., Stuhlmacher, A. S., & Meyer, L. L., (1998). *Gender and Negotiator Competitiveness: A Meta-analysis*.

cooperates and vice versa), women were significantly less cooperative than men. Research that restricted participants' communication and used abstract negotiation simulations showed a decreased difference in gender-specific behavior compared to face-to-face simulations.

The structural setup of a negotiation, for example if a cooperative or competitive strategy yield the best result for a specific negotiation, is found to affect gender specific behavior, making it difficult to generalize gender inclinations across negotiations. Low levels of interaction in a negotiation is found to have moderating effects on differences in cooperativeness between the genders. In summation, previous research on cooperativeness in negotiations is inconclusive, but a majority of the studies suggests that women are the more cooperative gender.

## **2.2 Fairness preferences**

A public good experiment devised by Fehr, Fishbacher and Gächter, which influenced the decision situation in this article, made the participants specify in advance their own contribution to the public good for each theoretically possible average contribution of the group.<sup>35</sup> Each group was made up of four individuals who each had to decide how to spend 20 tokens. The decision was between investing the tokens in a public good project or keeping the tokens for your own direct payoff. The groups were generated at random, without accounting for gender. Thus, the authors did not measure gender effects on the degree of cooperation and were unable to account for discrimination, but they found interesting general results for the whole population. The experiment was designed so that the predicted outcome according to standard theory was complete free riding, assuming rational and selfish individuals. However, data collected from the experiment showed that around 50 percent of the participants were in fact conditional cooperators, as their contribution to the group increased as the group members' average contribution increased and vice versa. Only one-third of the participants in the tests were free riding. As seen in figure 1, most conditional cooperators in the experiment showed a self-serving bias as they contributed less to the common good than others did on average.<sup>36</sup> The authors explain the motivation for conditional cooperation as a result of preferences for fairness.

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<sup>35</sup> Fehr, E., Fishbacher, U. & Gächter, S. (2000). Are People Conditional Cooperative? Evidence from a Public Goods Experiment

<sup>36</sup> Ibid. p. 12

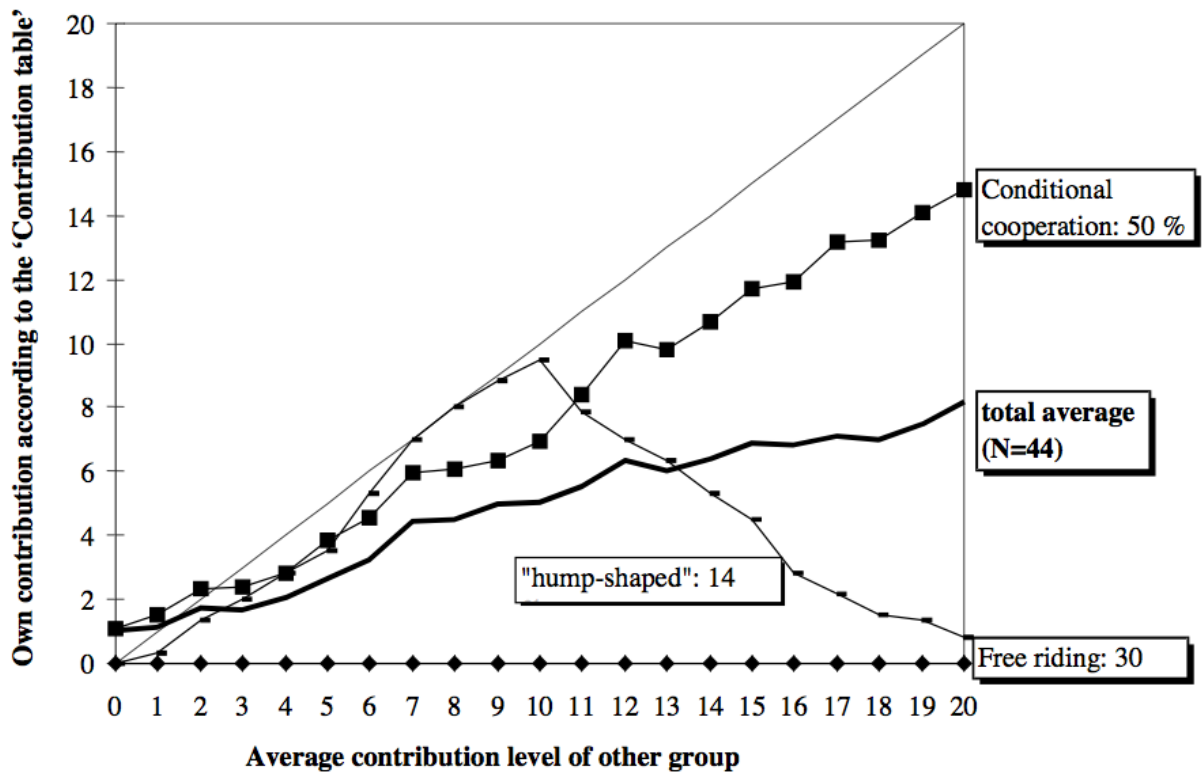


Figure 1. The above graph shows the classified decision behavior of the participants in Fehr, Fishbacher and Gächter's (2000) study "Are People Conditionally Cooperative?". Three distinct behavioral patterns was observed; Conditional cooperation, Free riding and "hump-shaped".

The ultimatum game, in which two participants are to divide a predetermined amount of money, is commonly used to experimentally demonstrate fairness preferences in bargain behavior in negotiations. The participants are given a role of either the proposer or the responder. The proposer is to give one proposal on how to divide the money with the responder. It is up to the responder to agree and receive the proposed amount of money, or to refuse the offer and receive nothing. If the responder accepts the offer, the proposer will receive the remaining amount, but if the offer is refused, both participants will instead receive nothing. The result in this game is that when offered less than 30 percent the responder is very likely to reject the offer, as he/she would rather receive nothing than receive a small portion, given the perception of being unfairly treated (the results change only marginally when the amount increases to sums as high as two months salary).<sup>37</sup> This contradicts the notion of self-interest maximizing behavior. The dominantly observed behavior of negative

<sup>37</sup> Fehr, E. & Gächter, S, (2000). Fairness and Retaliation: The Economics of Reciprocity, p. 161

reciprocity (a reciprocal preference that makes the decision-maker willing to cooperate only on equal or less stringent conditions than his partner) is arguably caused by some fairness-induced mechanism that hinders cooperation (see for example Rabin (1993), Fehr and Gächter (2000) and Dufwenberg and Kirchsteiger (2004)).<sup>38, 39, 40</sup> Andreoni and Vesterlund (2001) found gender differences in altruism by modifying a dictator game for varying prices and incomes. Women were more inclined to altruism when it was expensive, and men were more inclined to altruism when it was inexpensive. Women had a higher focus on equality whereas men were more sensitive to price changes.<sup>41</sup>

In sum, there seems to be a literature gap regarding research on gender differences in terms of fairness, in variable sum games. Findings for fixed sum games suggest that women are more egalitarian, give more when it is costly, and give less when it is inexpensive, compared to men. One aim with this study was to expand on these findings by exploring the subject in a variable sum matrix game, with various degrees of cooperation.

### **2.3 Discrimination**

Holm (1998) found, through cooperation and coordination “battle of the sexes” experiments, that women were discriminated against in favor of men by both sexes.<sup>42</sup> Through a series of ultimatum games, Solnick and Schweitzer (1999) found that men received between 13-17% more than women and less was demanded of them by both sexes. However, the authors did not find any difference in how women and men discriminate.<sup>43</sup> The perception about the partner participant willingness to cooperate, play a potentially big role in decisions in ultimatum games, but the general conclusion is that in fixed sum games, both sexes seem to discriminate women. This study was designed to test if gender discrimination is present in more complex variable sum matrix games as well.

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<sup>38</sup> Rabin, M. (1993). Incorporating Fairness Into Game Theory and Economics.

<sup>39</sup> Fehr, E. & Gächter, S, (2000). Fairness and Retaliation: The Economics of Reciprocity.

<sup>40</sup> Dufwenberg, M. & Kirchsteiger, G. (2004). A Theory of Sequential Reciprocity.

<sup>41</sup> Andreoni, J. & Vesterlund, L. (2001). Which is the Fair Sex? Gender Differences in Altruism.

<sup>42</sup> Holm, H. J., (1998). Gender-Based Focal Points

<sup>43</sup> Solnick, S.J., Schweitzer, M. E., (1999). The Influence of Physical Attractiveness and Gender on Ultimatum Game Decisions.

## 2.4 Risk propensity

A subject's propensity to take risks might be affected by both mechanisms influencing risk attitude and by mechanisms influencing beliefs about one's own relative ability. Whereas risk attitude describes one's relative willingness to take an accurately measured risk, beliefs about one's own relative ability play a role in the risk assessment. This study does not aim to examine the mechanisms affecting risk propensity, but only to test if gender specific differences in risk propensity exist. Previous economics literature on beliefs about subjects own relative ability, suggest that men overvalue their ability, and would thus be prone to make a decision that is more risky than what it is believed to be. Women were found to relatively undervalue their ability, and would thus be prone to make a decision that is less risky than believed (Niederle & Vesterlund, 2007, Kamas & Preston, 2009, and Niederle et al. 2010).<sup>44, 45, 46</sup> Eckel and Grossman (2008) found, by examining experimental economics studies, that in an experimental setting women are more risk averse than men.<sup>47</sup> Croson & Gneezy (2009) made similar findings when exploring gender differences in risk taking.<sup>48</sup> Byrnes et al. (1999) meta-analysis of psychology studies on the subject did not reach a clear conclusion, as some psychology studies had found women more risk averse, while others did not find significant gender differences in risk attitudes.<sup>49</sup> Summarizing previous studies on the topics of gender differences in risk attitudes and gender differences in beliefs, especially in settings involving economic instruments, women appear to be less prone to take risks than men.

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<sup>44</sup> Niederle M, Vesterlund L. (2007). Do women shy away from competition? Do men compete too much?

<sup>45</sup> Kamas L, Preston A. (2009). Social preferences, competitiveness and compensation: Are there gender differences?

<sup>46</sup> Niederle M, Segal C, Vesterlund L. (2010). How costly is diversity? Affirmative action in light of gender differences in competitiveness.

<sup>47</sup> Eckel CC, Grossman PJ. (2008). Men, women, and risk aversion: experimental evidence. In *Handbook of Experimental Economics Results*, ed. CR Plott, VL Smith, pp. 1061–73.

<sup>48</sup> Croson R, Gneezy U. (2009). Gender differences in preferences. *J. Econ. Lit.* 47(2):1–27

<sup>49</sup> Byrnes JP, Miller DC, Schafer WD. (1999). Gender differences in risk taking: a meta-analysis. *Psychol. Bull.* 75:367–83

## 2.5 Sex stereotyping

Previous studies on gender and cooperativeness have found that stereotypes of the competitive man and cooperative woman are deeply rooted in our collective consciousness (Pruitt et al, 1986; Stamato, 1992; Watson, 1994).<sup>50, 51, 52, 53</sup> In a negotiation experiment based on a Prisoner's Dilemma game, participants were more than three times as likely to guess that the opponent was a man rather than a woman when faced with a competitive strategy (King, Miles, & Kniska, 1991).<sup>54</sup> When participants in an experiment were made to believe that they were negotiating with a woman, although negotiating with a computer program, they saw her as more cooperative than when they thought the same computer program was a man (Matheson, 1991).<sup>55</sup> From that observation, it is inferred that the mere awareness of sex-role stereotypes brings forth stereotype confirming behavior in negotiations and the expectations on the negotiating behavior they create.<sup>56</sup> In an experiment by Kray et al. (2001), when the negotiation was framed as diagnostic of ability and characteristics linked to gender, men outperformed women.<sup>57</sup> This finding was explained by stereotype reactance.<sup>58</sup> Awareness of stereotypes makes people expect stereotypical behavior that are in turn confirmed in our mind by confirmation bias (Kahneman and Tversky, 1974).<sup>59</sup>

Conclusions from negotiation experiments show that gender creates expectations on the negotiating partner's behavior, and that these expectations of sex stereotypes induce a reactance behavior in the stereotype holder, that might affect negotiation outcomes. While studies on sex stereotyping of competitiveness are plenty, there seems to be a deficit of

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<sup>50</sup> Matheson, K. (1991). Social cues in computer-mediated negotiations: Gender makes a difference.

<sup>51</sup> Pruitt, D. G., Carnevale, P. J. D., Forcey, B. & Van Slyck, M. V. (1986). Gender effects in negotiation: Constituent surveillance and contentious behavior.

<sup>52</sup> Stamato, L. (1992). Voice, place, and process: Research on gender, negotiation, and conflict resolution.

<sup>53</sup> Watson, C. (1994). Gender versus power as a predictor of negotiation behavior and outcomes.

<sup>54</sup> King, W. C., Miles, E. W., & Kniska, J. (1991). Boys will be boys (and girls will be girls): The attribution of gender role stereotypes in a gaming situation

<sup>55</sup> Matheson, K. (1991). Social cues in computer-mediated negotiations: Gender makes a difference.

<sup>56</sup> Ibid.

<sup>57</sup> Kray, L. J., Thompson, L., Galinsky, A., (2001). Battle of the Sexes: Gender Stereotype Confirmation and Reactance in Negotiations

<sup>58</sup> Ibid.

<sup>59</sup> Kahneman, D. & Tversky, A. (1974). Judgement under Uncertainty: Heuristics and Biases

studies explicitly examining sex stereotyping of risk attitudes. As a consequence, this study was designed to examine sex stereotyping of risk attitudes in a matrix game. To create a hypothesis about the outcome of the test, sex stereotyping of competitiveness was used as a proxy for stereotyping of risk attitudes.

A theoretical explanation of the study, along with hypotheses and expected results, will be given in the next section.

### 3. Theory

Compared to a case-based negotiation game, an experiment in which participants play a matrix game may seem far removed from a real negotiation. However, the underlying traits, decisions and assumptions characteristic of a negotiation remain the same for both, and matrix games make for a more pure extraction of the variables in this analysis: gender effects on cooperation, fairness and discrimination in a negotiation, as well as gender-based propensity for risk taking and sex stereotyping.

#### 3.1 Theoretical specification

The matrix game called the Prisoners’ Dilemma recreates the main conflict in variable sum negotiations, a classification where almost all negotiations land according to the leading modern negotiation doctrine (Fisher et al, 1991).<sup>60</sup> The main conflict in a variable sum negotiation is the opportunity to jointly expand the pie (benefitting all parties), while running the risk of being exploited by the other participant. The classic Prisoner’s Dilemma game with two suspected criminals, held in separate interrogation on insubstantial evidence, is shown below.

Prisoner’s Dilemma	B: stays silent (cooperates)	B: betrays (competes)
A: stays silent (cooperates)	Each serves 1 year	A: serve 3 years B: goes free
A: betrays (competes)	A: goes free B: serve 3 years	Each serves 2 years

Table 1. The Prisoner’s Dilemma matrix.

The Nash equilibrium is a theoretical solution concept for non-cooperative games in which players are assumed to take into account the decision of the other players. The Nash equilibrium solution is a state of a game were no player can improve their position by changing their strategy, given the strategy of the opposing player. Here, the decision to betray

<sup>60</sup> Fisher, R., Ury, W. and Patton, B. (1991). Getting to Yes: negotiating Agreement Without Giving In



is considered the competitive strategy and staying silent is the cooperative strategy. The Nash equilibrium in a Prisoners' Dilemma game is that both participants play the competitive strategy and end up with a suboptimal outcome by serving two years. The game in this research was designed as a Prisoners' Dilemma game, but with variable degrees of cooperation. It was played with the strategy method with a monetary incentive and constructed so that the predicted outcome according to standard theory is complete free riding. The strategy method makes the participants reflect about all possible strategic choices and decide their level of cooperation in advance for each level of cooperation of the other negotiator. The experimental game was inspired by a Common Good game, devised by Fehr, Fishbacher and Gächter (2000) (discussed in section 2.2) and it is meant to capture women's and men's propensity for cooperation, fairness, discrimination, risk taking and sex stereotyping.<sup>61</sup>

The strategic structure of the game can be considered as follows: A random mechanism chooses one player to make his/her investment decision (in a natural setting, someone has to go first; in this experiment, the starting player is randomly selected). This decision is labeled "Unconditional investment" in the experiment, and is meant to elicit the participants' propensity for risks. In a natural setting the second player learns the investment of the first player, and then the second player decides how much to invest in the common project. In theory, as the game is played with the strategy method, the second player does not learn the unconditional investment of the other player but decides in advance how much to invest conditioned on all the potential unconditional investment of the other player. This decision is labeled "Conditional investment" in the experiment and is meant to elicit the participants level of cooperation. In the experiment, both players make both the decisions first and then the random mechanism decides which is the payoff relevant decision.

Under standard theory, assuming fully rational and fully selfish players, an investment of zero tokens (complete free riding) by the randomly chosen player, independent of the decision of the other player, is the predicted outcome. Therefore, when the game is played with the strategy method, all conditional investments (0-10) ought to be zero by rational and selfish players. Assuming that the other player understands the concept of rationality and selfishness, they, too, are predicted to invest zero in the project to prevent free riding of the

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<sup>61</sup> Fehr, E., Fishbacher, U. & Gächter, S. (2000). Are People Conditional Cooperative? Evidence from a Public Goods Experiment

other participant. To make sure to elicit pure preferences from the participants, the participants were told that the game was only played once with the same partner. In this way, the experiment was not corrupted by inter-temporal strategic choices. This was to make sure that if a participant chose to invest in line with the investment of the other participant, it was not due to reputation formation or fear of retaliation, as in a repeated game. In this way, the above investment decision can unambiguously be measured as the participant's inclination to be cooperative to a more or lesser extent, or to be competitive. Questions regarding the estimated unconditional investment of the other participant in a pair were designed to elicit the level of sex stereotyping. The below payoff function for the game (explained in section 5.1) was presented and explained to the participants prior to playing the game.

Total income = income from the private account (10 – investments to the project) + income from the project (0.8 \* sum of the investments to the project).

Although visually much more complex than the Prisoners' Dilemma payoff-matrix, the payoff-matrix for the game in this research (see table 2) shares the same structure as the Prisoners' Dilemma. Zero investment by both participants is the Nash equilibrium giving the suboptimal payoff of 10 points each. The best aggregated outcome is 32 points, 16 points each, expanding the yield by 60% compared to the Nash equilibrium. 18 points is the best possible individual score but does only yield an aggregated total of 26 points.

		Participant B investment																					
		10	9	8	7	6	5	4	3	2	1	0	10	9	8	7	6	5	4	3	2	1	0
Participant A investment	10	16	16	15.2	16.2	14.4	16.4	13.6	16.6	12.8	16.8	12	17	11.2	17.2	10.4	17.4	9.6	17.6	8.8	17.8	8	18
	9	16.2	15.2	15.4	15.4	14.6	15.6	13.8	15.8	13	16	12.2	16.2	11.4	16.4	10.6	16.6	9.8	16.8	9	17	8.2	17.2
	8	16.4	14.4	15.6	14.6	14.8	14.8	14	15	13.2	15.2	12.4	15.4	11.6	15.6	10.8	15.8	10	16	9.2	16.2	8.4	16.4
	7	16.6	13.6	15.8	13.8	15	14	14.2	14.2	13.4	14.4	12.6	14.6	11.8	14.8	11	15	10.2	15.2	9.4	15.4	8.6	15.6
	6	16.8	12.8	16	13	15.2	13.2	14.4	13.4	13.6	13.6	12.8	13.8	12	14	11.2	14.2	10.4	14.4	9.6	14.6	8.8	14.8
	5	17	12	16.2	12.2	15.4	12.4	14.6	12.6	13.8	12.8	13	13	12.2	13.2	11.4	13.4	10.6	13.6	9.8	13.8	9	14
	4	17.2	11.2	16.4	11.4	15.6	11.6	14.8	11.8	14	12	13.2	12.2	12.4	12.4	11.6	12.6	10.8	12.8	10	13	9.2	13.2
	3	17.4	10.4	16.6	10.6	15.8	10.8	15	11	14.2	11.2	13.4	11.4	12.6	11.6	11.8	11.8	11	12	10.2	12.2	9.4	12.4
	2	17.6	9.6	16.8	9.8	16	10	15.2	10.2	14.4	10.4	13.6	10.6	12.8	10.8	12	11	11.2	11.2	10.4	11.4	9.6	11.6
	1	17.8	8.8	17	9	16.2	9.2	15.4	9.4	14.6	9.6	13.8	9.8	13	10	12.2	10.2	11.4	10.4	10.6	10.6	9.8	10.8
0	18	8	17.2	8.2	16.4	8.4	15.6	8.6	14.8	8.8	14	9	13.2	9.2	12.4	9.4	11.6	9.6	10.8	9.8	10	10	

Table 2. Game payoff matrix.

 Payoff A  Payoff B

### 3.2 Hypothesis and expected results

**1. Cooperativeness.** In line with previous studies on competitiveness and gender differences (Eagly & Carli, 1981; Major, McFarlin, & Gagnon, 1984; Rancer & Baukus, 1987, Eagly & Johnson, 1990, Walters et al, 1998), women are expected to act slightly more cooperatively, in this case, making a slightly higher average conditional investment in the common project than men (hypothesis 1.).<sup>62, 63, 64, 65, 66</sup> However the gender effect is expected to be moderated by the lack of face-to-face interaction (Walters et. al., 1998).<sup>67</sup> The effect is expected to be further moderated as, since the seventies and eighties, when the bulk of previous studies are from, gender liberalization is expected to have created a higher acceptance for gender counter-stereotypic behavior. In total, women are expected to be slightly more cooperative than men.

**2. Fairness preferences.** Women are expected to be more egalitarian than men (Andreoni and Vesterlund, 2001), and thus be classified as conditional cooperators, to a higher extent than men (hypothesis 2.).<sup>68</sup>

**3. Discrimination.** Men are expected to receive higher conditional investments, from both men and women, in line with findings from ultimatum games (Solnick and Schweitzer, 1999) and from battle of the sexes games (Holm, 1998). Women are thus expected to be discriminated against by both sexes (hypothesis 3.).<sup>69, 70</sup>

**4. Risk attitude.** In line with previous studies on risk attitude (Byrnes et al. 1999, Eckel & Grossman, 2008 and Croson & Gneezy, 2009), men are expected to invest more in

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<sup>62</sup> Eagly, A. H., & Carli, L. L. (1981). Sex of researchers and sex-typed communications as determinants of sex differences in influenceability: A meta-analysis of social influence studies.

<sup>63</sup> Major, B., McFarlin, D. B., & Gagnon, D. (1984). Overworked and underpaid: On the nature of gender differences in personal entitlement.

<sup>64</sup> Rancer, A. S., & Baukus, R. A. (1987). Discriminating males and females on belief structures about arguing.

<sup>65</sup> Eagly, A. H., & Johnson, B. T. (1990). Gender and leadership style: A meta-analysis.

<sup>66</sup> Walters, A. E., Stuhlmacher, A. F. & Meyer, L. L., (1998). Gender and Negotiator Competitiveness: A Meta-analysis.

<sup>67</sup> Walters, A. E., Stuhlmacher, A. F. & Meyer, L. L., (1998). Gender and Negotiator Competitiveness: A Meta-analysis.

<sup>68</sup> Andreoni, J. & Vesterlund, L. (2001). Which is the Fair Sex? Gender Differences in Altruism.

<sup>69</sup> Solnick, S.J., Schweitzer, M. E., (1999). The Influence of Physical Attractiveness and Gender on Ultimatum Game Decisions.

<sup>70</sup> Holm, H. J., (2000). Gender-Based Focal Points.

the unconditional investment compared to women, but the difference is expected to be moderated by the fact that a higher investment is seen as the less competitive decision (hypothesis 4.).<sup>71, 72, 73</sup>

**5. Sex stereotyping.** Studies on sex stereotyping of competitiveness (Pruitt et al, 1986; Matheson, 1991; Stamato, 1992; Watson, 1994) are used as a proxy for hypothesis on sex stereotyping of risk attitudes.<sup>74, 75, 76, 77</sup> These studies portray a belief about men being more competitive than women. In line with this stereotype, men are expected to be believed to be more prone to taking risks and are expected to be believed to invest more in the unconditional investment compared to women (hypothesis 5.).

The data from the experiment is analyzed in the next section.

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<sup>71</sup> Byrnes JP, Miller DC, Schafer WD. (1999). Gender differences in risk taking: a meta-analysis.

<sup>72</sup> Eckel CC, Grossman PJ. (2008). Men, women, and risk aversion: experimental evidence.

<sup>73</sup> Croson R, Gneezy U. (2009). Gender differences in preferences.

<sup>74</sup> Matheson, K. (1991). Social cues in computer-mediated negotiations: Gender makes a difference.

<sup>75</sup> Pruitt, D. G., Carnevale, P. J. D., Forcey, B. & Van Slyck, M. V. (1986). Gender effects in negotiation: Constituent surveillance and contentious behavior.

<sup>76</sup> Stamato, L. (1992). Voice, place, and process: Research on gender, negotiation, and conflict resolution.

<sup>77</sup> Watson, C. (1994). Gender versus power as a predictor of negotiation behavior and outcomes.

## 4. Data

The experiments in this study were run through a tailored Google Docs online application to collect data based on decisions from 113 participants from 24 countries, between the ages of 18 and 65. 49 females and 64 males participated. The most represented nationality was Swedish with 38 percent (14 female, 29 male). The age group between 21 and 30 had the highest representation with 87 percent of the participants belonging to it (43 female, 55 male). 86 percent of the participants were professionals (39 female, 58 male) and 12 percent were students (9 female, 5 male) (see table 3). This is unusual for a Behavioral Economics study, which tend to consist of 1st or 2nd year university students.<sup>78</sup> 75 percent of the participants were young professionals at or below 30 (33 female, 52 male). 63 percent of the participants held a postgraduate education (23 female, 48 male). Of the postgraduate degrees, 60 percent were in Business Economics or Finance (15 female, 27 male), which had the highest representation.

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No. of participants: 113	Age <20	4
Female: 49	Age 21-30	98
Male: 64	Age 31-40	6
Origin of participants: 24 nationalities	Age 41-50	1
Professionals: 97	Age 51-60	3
Students: 14	Age 61-70	1

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*Table 3. Participant statistics*

### 4.1. Behavioral classification

The participants' decisions showed two distinctly unified behavioral patterns. The patterns were classified into categories: a) conditional cooperation i.e. investment correlated, at the 1-percent confidence level, to the investment of the partner participant; b) free riding

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<sup>78</sup> Walters, A. E., Stuhlmacher, A. F. & Meyer, L. L., (1998). Gender and Negotiator Competitiveness: A Meta-analysis

i.e. not investing at all; and c) “other”, where the majority of investment decisions best can be described as random.

**Conditional cooperation.** The participant’s investments for this category are correlated at the 1-percent confidence level, to the investment of the partner participant.<sup>79</sup> 63% of female to female investments, 59% of female to male investments, 56% of male to female investments, and 59% of male to male investments, belong to this category. This is in line with previous studies, but in the higher range (Berg, Dickhaut and McCabe, 1995; Falk and Gächter, 1999; Fehr and Falk, 1999).<sup>80, 81, 82</sup> 14% of the male participants' investments in this category, and 17% female participants' investments in this category, were perfectly conditionally cooperative, meaning exactly matching the investment of the partner participant.

**Free riding.** Participants in this category gave a 0 investment regardless of the investment of the partner participant. This is a strictly rational and selfish behavior in the description and prediction of classic theory. 8% of female to female investments, 6% of female to male investments, 14% of male to female investments, and 14% of male to male investments, belong to this category. This is lower compared to previous studies, where about 30% of subjects fall into this category (Berg, Dickhaut and McCabe, 1995; Falk and Gächter, 1999; Fehr and Falk, 1999).<sup>83</sup>

**Other.** Participant's investments falling into this category showed no significantly distinct unified pattern. Most investment decisions falling into this category can best be described as random. However, one male participant made a unilateral investment — contributing fully no matter the partner participant’s investment. Two male participants and two female participants made investments negatively correlated, to the 1-percent level, to the partner participant. Two male participants invested correlated to the partner participant for

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<sup>79</sup> Correlation calculation:  $ABS*(FISHERINV*((NORMSINV*((0.01/2))/((N-3)^{0.5}))))$ , N = 64 Male; 49 Female

<sup>80</sup> Berg, J. Dickhaut, J. & McCabe, K. (1995). Trust, Reciprocity and Social History.

<sup>81</sup> Falk, A & Gächter, S. (1999). Reputation or Reciprocity?

<sup>82</sup> Fehr, E. & Falk, A. (1999). Wage Rigidity in a Competitive Incomplete Contract Market

<sup>83</sup> Ibid

low investment levels but reversed this behavior and contributed negatively correlated to the partner participant for higher investment levels, creating a hump shaped investment pattern.

Investment		Classification		
By	To	Conditional cooperator	Free rider	Other
Female	Female	63%	8%	29%
	Male	59%	6%	35%
Male	Female	56%	14%	30%
	Male	59%	14%	27%

*Table 4. Classification composition*

## 5. Method

The decision situation that the matrix game in this experiment is based on is a variant of a standard linear public goods game (see Fischbacher, Gächter & Fehr, 2000).<sup>84</sup> The game is played with only two players to elicit gender effects from the participants' decision making. In this way, the structure is one of a Prisoners' Dilemma game with variable degrees of cooperation. The participants were recruited through a personal FaceBook invitation. Actual payoff occurred to only 5% of the participants.

### 5.1 Game design

Every participant played the game two times, first against a woman and then against a man. The partnering participant's gender in the pair was the only characteristic known to the participants and there was no communication between the participants. The game was only played once in each pair to extract the inclinations free from inter-temporal strategy contemplation. This creates an environment where the participants are not affected by future reputation and retribution, or other concerns related to iterated games.

Each participant in a pair was tasked with deciding how to spend ten tokens. The participant could either keep these tokens on a private account, or make the decision to invest them fully or partially into a common project. The following payoff function was explained to the participants of the experiment:

$$\text{Total income} = \text{income from the private account} (10 - \text{investments to the project}) + \text{income from the project} (0.8 * \text{sum of the investments to the project}).$$

The participants were informed that each token put on the private account would earn them exactly one point, and that they would earn points to a value of 80% of the sum of the total tokens invested in the project. The investment decision was clearly explained to the participants in the instructions to the experiment. The participants were thereafter provided examples of decisions and their respective outcome to make sure the participants fully understood the mechanisms of the payoff function. The decision situation consisted of two

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<sup>84</sup> Fehr, E., Fischbacher, U. & Gächter, S. (2000). Are People Conditional Cooperative? Evidence from a Public Goods Experiment



types of decisions. The first was a decision on an unconditional investment from 0 to 10 to the project. The second was a decision on investments conditioned on the other participant in the pair, like this: How much would you like to invest in the common project if the other participant contributes 0, 1, 2, 3, etc., up to 10? The decisions of the other participant in the pair were unknown while the decision-making was made. To make sure both decisions were taken equally seriously, the participants were told that only one of the two types of decisions were going to be the payoff relevant decision. Which one would be the payoff relevant decision would be chosen randomly after both decision types were made.

Top scoring participants would have the chance to receive their payoff in their home country currency, converted at the following rate:

$$1 \text{ point} = \text{SEK } 20 / \text{€}2 / \text{\$}3 / \text{£}2 / \text{HK } \$20.$$

The participants were told to make conditional decisions for every possible information set, instead of making actual choices. This game structure is called the strategy method. It differs from the, in matrix games, more commonly used direct response method, where the participant knows the decision of the other participant and then decide on a response.

## **5.2 Limitations**

The most obvious limitation of using a matrix game and the strategy method to simulate real world negotiations is the lack of communication, thus missing the components of coordination and persuasion. However, for the purpose of this research, blocking the noise of explicit bargaining will make elicit gender-based preferences a more precise matter, leading to more certain results. In a game theoretic view, the use of a strategic form game instead of an extensive form game should not affect the participant's decisions and thus the outcome of the game. However, asking the participants to reflect about all possible strategic choices in advance might make them think about the game differently, and in a more rational way. This might change the outcome of a game compared to the same game played with sequential decisions under the direct response method. But looking at empirical evidence comparing the outcome of studies using the strategy method compared to the direct response method, it does not seem as though the results differ (Casari & Cason, 2009 and Brandts and

Charness, 2010).<sup>85, 86</sup>

The small budget did not allow for promise of payoff to all participants, which could have altered the results; however, this could be assumed to affect both genders approximately equally. Perhaps the lower than anticipated amount of free riding was an effect of this. However, it should not have affected the gender comparison.

The fact that the experiment was conducted in the same order for all participants, first negotiation with a woman and then negotiation with a man, could potentially have mitigating effects on discrimination. However, it could be assumed to affect both gender equally and should thus, at least, not affect the comparison between the gender.

The invitations to the experiment was sent out on FaceBook to contacts of the author. The 23 percent of invites that decided to participate may have done so driven by altruism or warm glow, and thus potentially be composed of a higher proportion of altruistic people and a lower proportion of selfish people, compared to the average population. This could have effects on the results towards more cooperation and less free riding, compared to previous studies. But it is not expected to affect the genders differently, and should thus not interfere with the gender comparison.

Framing the conditional investment decision as an investment could potentially make participants believe it risky, overlooking the fact that the decision is completely isolated from risk. This could potentially lead risk averse participants to invest less in the conditional investment, compared to if the decision was fully understood. However, 71 percent of the female participants and 80 percent of the male participants read clarifying example decisions, detailing outcomes for different decision scenarios, in addition to the experiment instructions.

See appendix 9.1 for the instructions to the experiment, including the clarifying examples.

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<sup>85</sup> Casari, M. & Cason, T. N. (2009). The Strategy Method Lowers Measured Trustworthy Behavior\*

<sup>86</sup> Brandts, J. & Charness, G. (2011). The strategy versus the direct-response method: a first survey of experimental comparisons

## **6. Results**

Data was collected through the experiment for the conditional investment decisions, for the unconditional investment decision and for beliefs about males' and females' unconditional investments. The data for the conditional investment decisions were meant to capture if significant differences in gender specific inclination for cooperation exist. This data set was also categorized according to behavior (Conditional cooperator, Free rider and Other), in order to analyze if significant differences in categorization composition exist between the genders. The focus of the categorization was on the Conditional cooperator category, as that category was seen as eliciting a preference for fairness. The data for the unconditional investment was captured to examine if significant gender differences in propensity for risks exist. The belief data on the unconditional investment was captured to check potential differences in sex stereotyping.

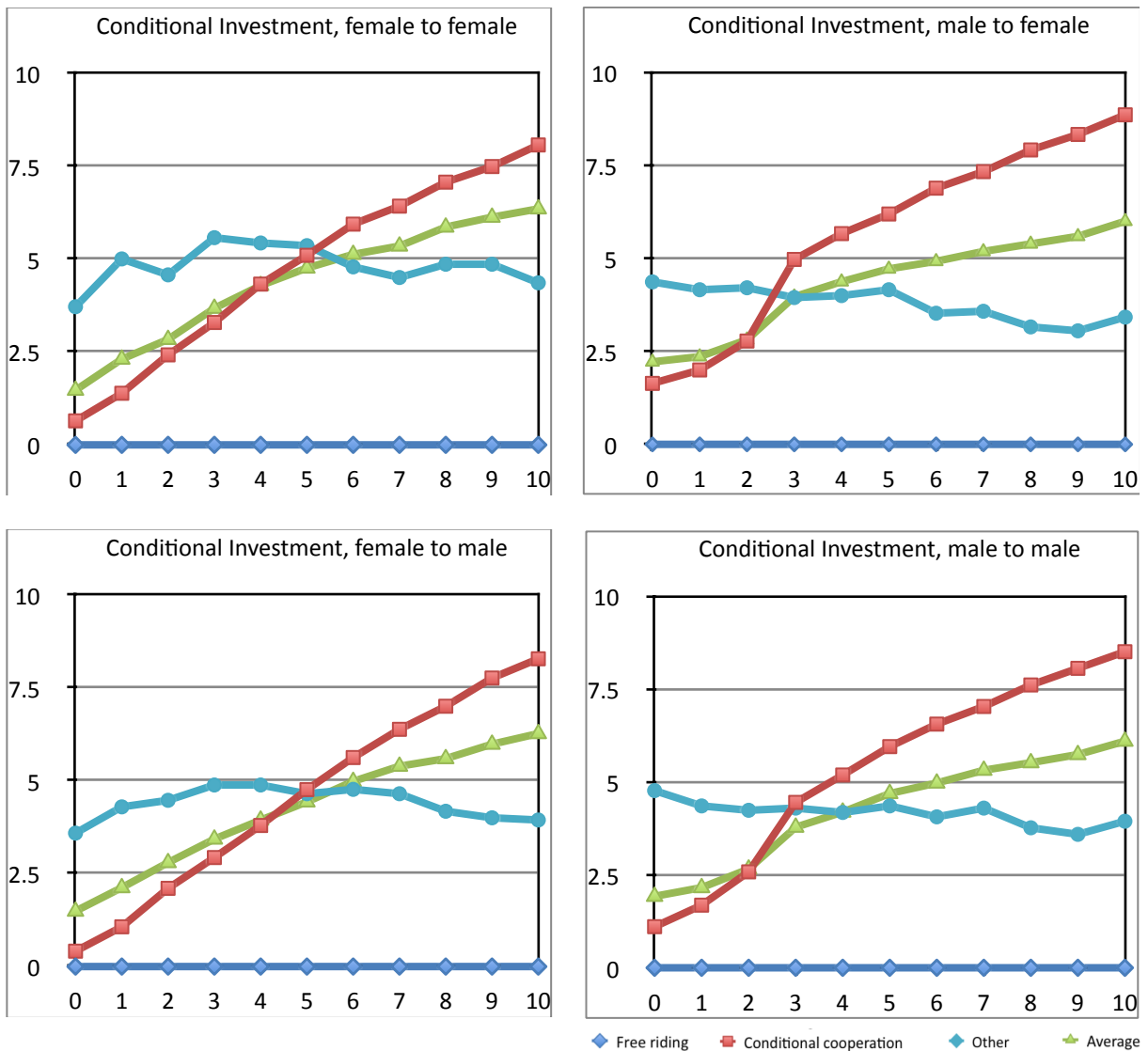
Significance for differences between the sexes in level of cooperation was tested with the two-tailed Mann-Whitney U-test. To test significance for differences in discrimination, the two-tailed Wilcoxon signed-rank test was used. The Chi<sup>2</sup> test was used to test if significant differences in categorization composition exist between the genders.

### **6.1 Conditional investment**

The data for the conditional investment decisions were tested for significance as the average investment per individual, to determine propensity for cooperation. In addition, the data sets for 0, 1, 2 , etc., up to 10 were tested to see if significant differences in cooperation were present for different levels of stakes. The total female and male populations were tested both for differences in level of cooperation and in discrimination. Neither test using the conditional investment data set showed any significant differences between the genders. In summation, there was no significant discrimination by either of the genders.

Conditional Investment Average						
By	Total Average	To	Total	Free rider	Conditional cooperators	Other
Female	4.30	Female	4.37	0	4.74	4.82
		Male	4.22	0	4.55	4.39
Male	4.30	Female	4.32	0	5.69	3.78
		Male	4.27	0	5.33	4.17

Table 5. Conditional Investment Average



Graph 2. Female recipients are shown at the top, and male recipients are shown below. Women as a whole contributed on average slightly less than men for low amounts and slightly more on average for high amounts, towards both sexes. In the conditional cooperation group, women contributed on average slightly less than men, towards both sexes. However in the “other” group, women contributed on average slightly more than men, towards both sexes. Neither of the results were significant.

## 6.2 Categorization composition

No significant differences in classification of behavior towards the different genders (discrimination) were found. Neither were there any significant differences in the composition of classifications (conditional investment, free rider, other) between the genders. However, a small, statistically non-significant, number of participants behaved in such a discriminating way that their behavior was in line with one categorization towards female participants and another categorization towards male participants.

## 6.3 Unconditional investment

The Unconditional Investment was a specified investment amount for an unspecified counter investment by the partner participant. It was designed to elicit risk propensity. Male participants invested 24 percent more to female participants, than what female participants invested to other female participants (5.50 points compared to 4.43 points), (P-value: 0.034) significant at 95% confidence level. Male participants invested 25 percent more to other male participants, than what female participants invested to male participants (5.70 points compared to 4.55 points), (P-value: 0.044) significant at 95% confidence level. There were no significant differences in how males invested to males, compared to how they invested to females. The same goes for female participants' behavior. In summation, male participants invested significantly more to both sexes than what female participants did.

Unconditional Investment			
By	Total Average	To	Total
Female	4.49	Female	4.43
		Male	4.55
Male	5.60	Female	5.50
		Male	5.70

Table 6. Unconditional Investment

#### 6.4 Beliefs unconditional investment

Men believed that male participants would invest significantly more than female participants (P-value: 0.046), 12 percent or 5.30 compared to 4.75, significant at 95% confidence level. Women also believed that male participants would invest significantly more than female participants (P-value: 0.046), 16,5 percent or 5.30 compared to 4.55, significant at 95% confidence level. However, there was no significant difference between the sexes in their belief about the investments.

Beliefs Unconditional Investment		
Of	About	Total
Female	Female	4.55
	Male	5.30
Male	Female	4.75
	Male	5.30

*Table 7. Beliefs Unconditional investment*

## 7. Conclusions

This study was meant to explore possible underlying gender-specific inclinations, fundamental to negotiation outcomes. Gender-based tendencies for: cooperation, fairness, discrimination, risk taking, and sex stereotyping. The study was not meant to explore gender-based negotiator effectiveness or performance. The below questions were posed in order to explore these tendencies:

- Do gender differences in propensity to cooperate exist?
- Do gender differences in fairness preferences exist?
- Do gender-based tendencies to discriminate exist; if so, who is discriminated by whom?
- Do gender-based differences in risk propensity exist?
- Do gender-based tendencies to stereotype exist; if so, do women and men hold different sex stereotypes?

Based on previous studies, the below hypothesis were formulated and tested in order to address the above questions.

1. Women were expected to behave slightly more cooperatively, in this case, investing slightly more in the common project than men.
2. Women were expected to behave more egalitarian, i.e. be classified as conditional cooperators to a higher extent than men.
3. Women were expected to receive lower conditional investments from both women and men, and thus be discriminated against by both sexes.
4. Men were expected to take higher risk and invest more in the unconditional investment compared to women.
5. Men were expected to be believed to be more prone to risks and thus believed to invest more in the unconditional investment compared to women.

The results from the tests showed that:

- There were no differences in level of cooperation between the sexes, as no significant gender differences for the conditional investment were found. The first hypothesis was thus rejected.

- Neither were women more egalitarian as there was no significant gender difference in conditional cooperation classification. The second hypothesis was thus also rejected.
- There was no significant discrimination of or by either of the sexes, for any of the investment decisions. The third hypothesis was thus rejected.
- Men were found to be more prone to taking risks than women, and invested significantly more in the risky unconditional investment, compared to women, to both women and men. The fourth hypothesis was thus accepted.
- Both female- and male participants believed that men would take higher risks and invest significantly more in the unconditional investment than women would. The fifth hypothesis was thus accepted.

A tentative interpretation of the results could be that gender differences in propensity to take risks may help men to achieve better results in negotiations in organizational life, as men would be more inclined to; take higher risks in negotiations and be more inclined to enter risky negotiations, thereby ultimately more likely to enter riskier positions and fields with higher rewards, than women would be. The mere sex stereotype of differences in risk propensity could potentially elevate this effect by stereotype reactance.

Further theoretical research regarding risk propensity and negotiation success, together with empirical research regarding possible gender differences in: frequency to apply for a new job; frequency to initiate salary negotiations; tendency to quit current job to search for a new one; tendency to apply for a higher level position (a more risky position), could possibly confirm if risk propensity and stereotypes of risk attitudes play a role in the wage gap and in the glass ceiling phenomena. If differences in risk propensity and stereotypes of risk attitudes do indeed prove to have an effect on the observed gender inequality in organizational life, then policies to lower the risk of becoming, and being unemployed (for example barriers to fire people and unemployment benefits), together with policies to lower the risk of initiating a salary negotiation (for example mandatory yearly salary negotiations), would potentially contribute to increased gender equality in organizational life.



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## 9. Appendix

### 9.1 The investment decision experiment

The below was presented to the participants of the experiment through a tailored Google Docs online application.<sup>87</sup> All participants played the game two times, once with a female participant and once with a male participant.

#### Investment decision experiment

Thank you for taking part in this economic experiment. If you read the following instructions carefully, you can, depending on your decisions and chance, earn a considerable amount of money in relation to the time you spend. It is therefore important that you read these instructions with care. The monetary incentive is meant to make sure that every participant will do his or her best in the experiment. Please take your time to think the decisions through, but do not dwell on the decisions too long. Estimated time is 20 min. During the experiment, different currencies will not be discussed but rather points, as your entire earnings will be calculated in points. Randomly selected participants that score in the top half will receive their earnings in their home country currency, converted at the following rate:

1 point = SKr20 / €2 / \$3 / £2 / HK\$20.

Please start by filling out your personal information below.

Your name will not be disclosed and your personal information will be treated confidentially.

#### Participant information

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<sup>87</sup> Link to the experiment: [https://docs.google.com/spreadsheet/viewform?usp=drive\\_web&formkey=dDdCNXIyLTM5bFJqVTk2OUVkeF9EU2c6MQ#gid=0](https://docs.google.com/spreadsheet/viewform?usp=drive_web&formkey=dDdCNXIyLTM5bFJqVTk2OUVkeF9EU2c6MQ#gid=0)

Name: \_\_\_\_\_

Gender:

Female

Male

Age:

20 and younger

21-30

31-40

41-50

51-60

61-70

Field of study/Occupation: \_\_\_\_\_

Nationality: \_\_\_\_\_

## **Experimental instructions**

### **The decision situation**

You are a participant in a pair of two people. Except the experimenters, nobody knows exactly who is in which pair. However, you will learn the gender of the participant that you will be matched with before you make your investment decision. Each participant has to decide on the investment of 10 tokens that can be invested fully or partially into a project, or saved for you on a private account. Each token you do not invest into the project will automatically be transferred to your private account.

### **Your income from the private account**

For each token you put on your private account you will earn exactly one point. For example, if you put ten tokens onto your private account (which implies that you do not invest anything into the project) you will earn exactly ten tokens from the private account. Nobody except you earns anything from your private account.

### **Your income from the project**

From the token amount you invest into the project each participant will get the same payoff. You will also get a payoff from the tokens the other participant invests into the project. For each participant the income from the project will be determined as follows:

$$\text{Income from the project} = \text{sum of the investments to the project} * 0.8.$$

For example, if the sum of the investment to the project is 15 tokens, then you and the other participant will get a payoff of  $15 * 0.8 = 12$  points each from the project.

### **Your total income**

Your total income results from the summation of your income from the private account and your income from the project.

Total income = income from the private account (10 – investments to the project) + income from the project ( $0.8 * \text{sum of the investments to the project}$ ).

### **The Experiment**

The experiment contains the decision situations that have just been described to you. If randomly selected and scoring in the top half, you will get paid according to the decisions you make in this experiment.

As you know you will have 10 tokens at your disposal. You can put them into a private account or you can invest them into a project. In this experiment each subject has to make two types of decisions. In the following they will be called “unconditional investment” and “conditional investment”.

- With the unconditional investment to the project you have to decide how many of the 10 tokens you want to invest in the project unconditionally.
- Your second task is to fill out your conditional investments. Here you have to indicate for each possible investment of the other participant how many tokens you want to invest in the project. You can condition your investment on the investment of the other participant.

After all participants of the experiment have made an unconditional investment and have filled out their conditional investment, in each pair a random mechanism will select one participant. For the randomly determined participant only the conditional investments will be the payoff-relevant decision. For the participant that is not selected, only the unconditional investment will be the payoff-relevant decision. Two examples at the end of the document should make this clear. If you already are sure that you comprehend the experiment then you may please start to indicate your investments to the project below. Otherwise, please read the two examples at the end of the document.

### **Unconditional Investment**

Please indicate your unconditional investment in the project in integral numbers

(0-10):

### **Conditional Investment**

The numbers next to the input boxes indicate possible investments of the other participant in the project. Please simply insert into each box how many tokens you will invest in the project – conditional on the indicated investment of the other participant. You have to make an entry into each input box. For example, you will have to indicate how much you invest in the project if the other participant invests 0, 1, or 2 tokens etc. In each input box you can insert all integer numbers from 0 to 10.

Please indicate your conditional investment in the project below



0  1  2  3  4  5  6  7  8  9  10

### **Motivational Questions**

Please indicate in integral numbers what you think is the average unconditional investment of male participants? (0-10):

Please indicate in integral numbers what you think is the average unconditional investment of female participants? (0-10):

When you made your investment decisions, did you regard how your decisions might affect your partner's outcome?

Yes

No

When you made your investment decisions, was your strategy to maximize your own total points?

Yes

No

When you made your investment decisions, did you take into account the gender of your partner?

Yes

No

## Optional Clarifying Examples

Please indicate below if you read the examples.

Example 1: Assume that you have been selected by the random mechanism. This implies that your relevant decision will be your conditional investments. For the other participant the unconditional investment is the relevant decision. Assume the other participant have made an unconditional investment of 2 tokens. If you have indicated in your conditional investment that you will invest 1 token if the other participant invests 2 tokens, then the total investment in the project is given by  $2 + 1 = 3$  tokens. Both participants therefore, earn  $0.8 \times 3 = 2.4$  points from the project plus their respective income from the private account. If you have instead indicated in your conditional investment that you will invest 9 tokens if the other participant invests 2 tokens, then the total investment to the project is given by  $2 + 9 = 11$ . Both participants therefore earn  $0.8 \times 11 = 8.8$  points from the project plus their respective income from the private account.

Example 2: Assume that you have not been selected by the random mechanism, which implies that for you the unconditional investment is taken as the payoff-relevant decision. Assume your unconditional investment is 8 tokens. If the participant who has been selected by the random mechanism indicates in his conditional investment that he will invest 2 token if the other participant invest 8 tokens, then the total investment to the project is given by  $8 + 2 = 10$  tokens. Both participants will therefore earn  $0.8 \times 10 = 8$  points from the project plus their respective income from the private account. If instead the randomly selected participant indicates in his conditional investment that he invests 9 tokens if the other participant invests 8 tokens, then the total investment to the project is  $8 + 9 = 17$  tokens. Both participants will therefore earn  $0.8 \times 17 = 13.6$  points from the project plus their respective income from their private account.

Did you read the optional clarifying examples?

Yes

No