He, Haoran; Martinsson, Peter; Sutter, Matthias

Working Paper
Group Decision Making Under Risk: An Experiment with Student Couples


Provided in Cooperation with:
Institute of Public Finance, University of Innsbruck

Suggested Citation: He, Haoran; Martinsson, Peter; Sutter, Matthias (2011) : Group Decision Making Under Risk: An Experiment with Student Couples, Working Papers in Economics and Statistics, No. 2011-27, University of Innsbruck, Research Platform Empirical and Experimental Economics (eeecon), Innsbruck

This Version is available at:
http://hdl.handle.net/10419/73546

Terms of use:
Documents in EconStor may be saved and copied for your personal and scholarly purposes.
You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.
If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.
Group Decision Making Under Risk: An Experiment with Student Couples

Haoran He, Peter Martinsson, Matthias Sutter

Working Papers in Economics and Statistics
2011-27
University of Innsbruck
Working Papers in Economics and Statistics

The series is jointly edited and published by

Department of Economics
Department of Public Finance
Department of Statistics

Contact Address:
University of Innsbruck
Department of Public Finance
Universitaetsstrasse 15
A-6020 Innsbruck
Austria
Tel: + 43 512 507 7171
Fax: + 43 512 507 2970
e-mail: eeecon@uibk.ac.at

The most recent version of all working papers can be downloaded at
http://eeecon.uibk.ac.at/wopec/

For a list of recent papers see the backpages of this paper.
Group Decision Making Under Risk: An Experiment with Student Couples§

Haoran He*

School of Economics and Business Administration, Beijing Normal University, China

Department of Economics, University of Gothenburg, Sweden

Peter Martinsson†

Department of Economics, University of Gothenburg, Sweden

Matthias Sutter‡

Department of Public Economics, University of Innsbruck, Austria

Department of Economics, University of Gothenburg, Sweden

Abstract
In an experiment, we study risk-taking of cohabitating student couples, finding that couples’ decisions are closer to risk-neutrality than single partners’ decisions. This finding is similar to earlier experiments with randomly assigned groups, corroborating external validity of earlier results.

JEL Classification: C91; C92.

Key words: Risk experiment; Student couples; Group decision making.

§ Acknowledgements: We would like to thank an anonymous referee for very helpful comments. Financial support from the Jan Wallander and Tom Hedelius Foundation, from Wilhelm and Martina Lundgrens Science Foundation and from the Swedish Research Council (Vetenskapsrådet) is gratefully acknowledged.

* School of Economics and Business Administration, Beijing Normal University, Xinjiekouwai Street 19, 100875 Beijing, China. Phone: +86(10)58807847; E-mail: haoran.he@bnu.edu.cn.

† Department of Economics, University of Gothenburg, Box 640, 405 30 Gothenburg, Sweden. Phone: +46(31)7865255; E-mail: peter.martinsson@economics.gu.se.

‡ Department of Public Finance, University of Innsbruck, Universitaetsstrasse 15, A-6020 Innsbruck, Austria. Phone: +43(512)5077170; E-mail: matthias.sutter@uibk.ac.at.
1. Introduction

Many important decisions in human life are made by groups rather than individuals. Think of families, executive boards, legislatures or committees. Even the main agents in introductory economic textbooks, e.g., households and firms, are typically not individuals, but groups of people with a joint stake in economic decisions. The range of decisions taken by teams is wide, including, for example, market entry decisions of companies or savings and investment decisions of households. Risk is necessarily an important dimension of such decisions. Therefore, the recent literature on group decision-making has put a strong emphasis on group decision-making under risk. Since observing and identifying the influence of group decision-making on risky choices is difficult with field data (see Prather and Middleton, 2002, for an exception using data from mutual fund management), most of this literature has used laboratory experiments to explore group decision-making under risk (e.g., Baker et al., 2008; Shupp and Williams, 2008; Maselet et al., 2009). In these experiments, subjects are randomly assigned to groups and are then requested to make a group decision (either by talking to each other or by voting within a group). Typically, groups are found to have a smaller variance in their risk preferences than individuals. Concerning the question of whether groups are more or less risk-averse than individuals, the general evidence seems to suggest that groups are more risk-averse in lotteries with low probabilities of winning the largest payoffs, but less risk-averse when these probabilities are high (e.g., Baker et al., 2008; Shupp and Williams, 2008; Maselet et al., 2009). This pattern is consistent with group choices being closer to what would be expected of rational, risk-neutral decisions in risk experiments. This matches the general finding from experimental research on group decision making that groups are more rational agents than single individuals (Cooper and Kagel, 2005; Kocher and Sutter, 2005).

One potential problem of group decision-making research concerns the formation of groups, though. In the studies referred to above, groups are formed by randomly assigning subjects who don’t know each other to a specific group. This raises the question of whether more naturally occurring groups with a longer history behave in the same way as artificially created ad-hoc groups. In a nutshell, the question concerns the external validity of group research with randomly assigned groups. A recent strand of literature has tried to examine this
question by studying the decision-making of couples, some of them married for several decades, that are drawn from the general population (e.g., Bateman and Munro, 2005; Carlsson et al., 2009; de Palma et al., 2011). While this approach is highly welcome, it is difficult to compare the results from these latter studies with the controlled laboratory experiments with randomly assigned groups because two features have been simultaneously changed (the subject pool – students versus subjects from the general population – and the group formation – randomly assigned ad-hoc groups versus natural groups with a history), confounding attempts to draw inferences about the external validity of randomly assigned groups.

In this paper, we contribute to the literature on group decision-making by running an experiment with student couples. Thus, we keep the subject pool comparable to earlier studies with randomly assigned ad-hoc groups, but we investigate natural groups in the sense that we consider couples who have been cohabitating for 18.5 months on average. By taking this approach, we can check how these couples make risky choices and how their joint decisions relate to their individual decisions. Unfortunately, the previous experimental literature on ad-hoc groups and risky choices has used only three-person groups, nor has it controlled for the gender composition of groups in the analysis of differences between individuals and groups (Baker et al., 2008; Shupp and Williams, 2008; Maselet et al., 2009). Since group formation has been random in these earlier studies, however, the differences between individuals and groups have most probably not been influenced by the gender composition of groups. In our case, groups always consist of one woman and one man.

Section 2 introduces the experimental design. Section 3 presents the results, and section 4 concludes.

2. Experimental design

The experiment was conducted with university students in student residential areas around several universities in Guiyang, the capital of an inland province in southwest China. In the experiment, we used the design by Holt and Laury (2002), asking subjects to make 10
sequential choices between one “safe” option A (with payoffs of 16 or 20 Yuan) and one “risky” option B (with payoffs of 1 or 38.5 Yuan), with probabilities of higher payoffs increasing from 10% to 100%, as illustrated in Table 1.

Table 1 about here

We recruited 100 cohabitant student couples (100 males and 100 females) by randomly knocking on doors in student residential areas. After obtaining agreement from both partners on a time to conduct the experiment, an experimenter arrived at their apartment and conducted the experiment. First, couples were asked to make 10 choices individually (in different corners of a room with their backs towards each other; they were not allowed to talk to each other in this part), and, second, they made the same choices jointly by talking to each other, and agreeing on each decision in the ten choices. The subjects were not made aware of the second part before they had completed their individual decisions.1 At the end of the experiment, subjects were paid for both parts of the experiment by randomly picking one choice each from the individual part and one from the joint part. On average, subjects earned 49 Yuan plus a 10 Yuan participation fee (approximately 8.3 USD at the time of the experiment).

3. Experimental results

Figure 1 illustrates the fraction of subjects choosing the relatively safe option A in each choice situation.2 Panel (a) distinguishes between the choices of males, females, and couples. The dashed line represents the prediction for a risk-neutral, payoff-maximizing decision maker. We see that females are clearly more risk averse than males (p < 0.05; two-sided

---

1 A similar sequential procedure was also used in Baker et al. (2008), where no order effects were found when the authors controlled for it. Hence, we have not varied the order of decisions in our experiment, meaning that individual decisions are always taken before the group decisions.

2 We have excluded data from 8 households either because one of the partners or because the couple together made inconsistent choices (by switching back and forth between option A and option B). The following analysis is therefore based on data from 92 households (i.e., 184 subjects).
Mann-Whitney U-test), which is a fairly robust result in the literature (see e.g., Croson and Gneezy, 2009). The joint choices of couples are almost always in between the male and female frequencies of choosing option A, and they are significantly different both from male and female choices ($p < 0.05$; two-sided Wilcoxon signed ranks tests). Panel (b) indicates that the joint choices are practically indistinguishable from individual choices when male and female choices are pooled ($p = 0.92$; two-sided Wilcoxon U-test). These main findings are also supported by Table 2 that reports overall averages of safe choices and the corresponding standard deviations. It is worth noting that the variance of risk preferences is smaller for couples than for pooled individuals ($p < 0.01$; Levene F-test), probably because couples will average out the more risk-averse women and more-risk loving men.

In the following, we present a random effects probit regression analyzing the probability of choosing the “safe choice” (i.e., option A). We present two models, one including only individual choices of males and females to examine gender differences, and one that compares the decisions of couples with individual choices. Model (1) shows that the “probability of winning the high payoff” has a significantly negative impact on the likelihood of choosing the safe option. Males are significantly less risk-averse than females. We also consider an interaction variable between the probability of winning the higher payoffs and male choices in order to see whether gender differences depend on the probability of winning the high payoffs. This, however, is shown not to be the case at conventional levels of significance. Model (2) adds the couple data to model (1). Again, the probability of winning the higher payoff is significantly negative. The dummy variable for “couple” has a significantly positive sign (with individual decisions of men and women as the benchmark), while the interaction term “Probability*couple” (which ranges from 0.1 to 1.0 for couples) is significantly negative. Taking both variables together, it follows that couples are more risk-averse than individuals when the probability of the higher payoffs is low, but less
risk-averse when it is high. This implies that couples are closer to the prediction under risk-neutrality than individuals (see also Figure 1).

\[\text{Table 3 about here}\]

4. Conclusion

We have run an experiment on group decision-making by letting cohabitating student couples make risky choices. This has enabled us to study decision-making of long-standing groups with a history of cohabiting for 18 months on average. In line with previous findings (e.g., Masclet et al., 2009), we have found that both individuals and couples are, on average, risk-averse in their choices and that risk preferences are less diverse across groups (i.e., couples) than across individuals. Couples are generally more risk averse than individuals in lotteries with a low probability of winning, but less risk averse when the probability of winning higher payoffs is high. This is very similar to findings in Baker et al. (2008) who had used randomly assigned groups to study group decision-making under risk. Our paper has shown that naturally occurring groups with a joint history (i.e., student couples) show practically the same choice pattern, lending faith to the external validity of group decision-making research that relies on randomly assigned ad-hoc groups.
References


### Table 1. The ten paired lottery-choice decisions.

<table>
<thead>
<tr>
<th>Choice</th>
<th>Option A</th>
<th></th>
<th>Option B</th>
<th></th>
<th>Expected payoff (A - B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prob. (p)</td>
<td>Payoff (yuan)</td>
<td>Prob. (1-p)</td>
<td>Payoff (yuan)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1/10</td>
<td>20</td>
<td>9/10</td>
<td>16</td>
<td>1/10 38.5 9/10 1</td>
</tr>
<tr>
<td>2</td>
<td>2/10</td>
<td>20</td>
<td>8/10</td>
<td>16</td>
<td>2/10 38.5 8/10 1</td>
</tr>
<tr>
<td>3</td>
<td>3/10</td>
<td>20</td>
<td>7/10</td>
<td>16</td>
<td>3/10 38.5 7/10 1</td>
</tr>
<tr>
<td>4</td>
<td>4/10</td>
<td>20</td>
<td>6/10</td>
<td>16</td>
<td>4/10 38.5 6/10 1</td>
</tr>
<tr>
<td>5</td>
<td>5/10</td>
<td>20</td>
<td>5/10</td>
<td>16</td>
<td>5/10 38.5 5/10 1</td>
</tr>
<tr>
<td>6</td>
<td>6/10</td>
<td>20</td>
<td>4/10</td>
<td>16</td>
<td>6/10 38.5 4/10 1</td>
</tr>
<tr>
<td>7</td>
<td>7/10</td>
<td>20</td>
<td>3/10</td>
<td>16</td>
<td>7/10 38.5 3/10 1</td>
</tr>
<tr>
<td>8</td>
<td>8/10</td>
<td>20</td>
<td>2/10</td>
<td>16</td>
<td>8/10 38.5 2/10 1</td>
</tr>
<tr>
<td>9</td>
<td>9/10</td>
<td>20</td>
<td>1/10</td>
<td>16</td>
<td>9/10 38.5 1/10 1</td>
</tr>
<tr>
<td>10</td>
<td>10/10</td>
<td>20</td>
<td>0/10</td>
<td>16</td>
<td>10/10 38.5 0/10 1</td>
</tr>
</tbody>
</table>

Note: One USD was equal to 7.1 Yuan at the time of the experiment.

### Table 2. Descriptive statistics.

<table>
<thead>
<tr>
<th>Number of safe choices</th>
<th>Male</th>
<th>Female</th>
<th>Individual pooled</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Option A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.48</td>
<td>5.25</td>
<td>4.86</td>
<td>4.84</td>
</tr>
<tr>
<td>Median</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.90</td>
<td>1.69</td>
<td>1.83</td>
<td>1.56</td>
</tr>
</tbody>
</table>
Table 3. Random effects probit regression results for probability of safe choice

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model (1)</th>
<th>Model (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of winning the high payoff</td>
<td>-44.251***</td>
<td>-46.069***</td>
</tr>
<tr>
<td></td>
<td>(10.000)</td>
<td>(4.058)</td>
</tr>
<tr>
<td>Male</td>
<td>-6.301*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.445)</td>
<td></td>
</tr>
<tr>
<td>Probability*male</td>
<td>5.653</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.113)</td>
<td></td>
</tr>
<tr>
<td>Couple</td>
<td></td>
<td>4.442*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.666)</td>
</tr>
<tr>
<td>Probability*couple</td>
<td>-8.553*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.708)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>25.438***</td>
<td>24.684***</td>
</tr>
<tr>
<td></td>
<td>(5.827)</td>
<td>(2.082)</td>
</tr>
<tr>
<td>Rho (Corr. Coeff.)</td>
<td>0.982</td>
<td>0.986</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,840</td>
<td>2,760</td>
</tr>
<tr>
<td>Number of decision makers</td>
<td>184</td>
<td>276</td>
</tr>
</tbody>
</table>

Note: The table shows the regression coefficients. *** denotes significance at the 1% level, ** at the 5% significance level, and * at 10% significance level.

Figure 1. The cumulative distribution of safe choices (of option A).
University of Innsbruck - Working Papers in Economics and Statistics
Recent Papers can be accessed on the following webpage:
http://eeecon.uibk.ac.at/wopec/

2011-27 Haoran He, Peter Martinsson, Matthias Sutter: Group Decision Making Under Risk: An Experiment with Student Couples forthcoming in Economics Letters


2011-23 Gerhard Reitschuler, Rupert Sendlhofer: Fiscal policy, trigger points and interest rates: Additional evidence from the U.S.

2011-22 Bettina Grün, Ioannis Kosmidis, Achim Zeileis: Extended beta regression in R: Shaken, stirred, mixed, and partitioned

2011-21 Hannah Frick, Carolin Strobl, Friedrich Leisch, Achim Zeileis: Flexible Rasch mixture models with package psychomix

2011-20 Thomas Grubinger, Achim Zeileis, Karl-Peter Pfeiffer: evtree: Evolutionary learning of globally optimal classification and regression trees in R

2011-19 Wolfgang Rinnergschwentner, Gottfried Tappeiner, Janette Walde: Multivariate stochastic volatility via wishart processes - A continuation


2011-17 Stefan Borsky, Andrea Leiter, Michael Pfaffermayr: Does going green pay off? The effect of an international environmental agreement on tropical timber trade

2011-16 Pavlo Blavatskyy: Stronger Utility
2011-15 Anita Gantner, Wolfgang Höchtl, Rupert Sausgruber: The pivotal mechanism revisited: Some evidence on group manipulation

2011-14 David J. Cooper, Matthias Sutter: Role selection and team performance

2011-13 Wolfgang Höchtl, Rupert Sausgruber, Jean-Robert Tyran: Inequality aversion and voting on redistribution

2011-12 Thomas Windberger, Achim Zeileis: Structural breaks in inflation dynamics within the European Monetary Union


2011-10 Stefan Borsky, Paul A. Raschky: A spatial econometric analysis of compliance with an international environmental agreement on open access resources

2011-09 Edgar C. Merkle, Achim Zeileis: Generalized measurement invariance tests with application to factor analysis

2011-08 Michael Kirchler, Jürgen Huber, Thomas Stöckl: Thar she bursts - reducing confusion reduces bubbles modified version forthcoming in American Economic Review

2011-07 Ernst Fehr, Daniela Rützler, Matthias Sutter: The development of egalitarianism, altruism, spite and parochialism in childhood and adolescence

2011-06 Octavio Fernández-Amador, Martin Gächter, Martin Larch, Georg Peter: Monetary policy and its impact on stock market liquidity: Evidence from the euro zone

2011-05 Martin Gächter, Peter Schwazer, Engelbert Theurl: Entry and exit of physicians in a two-tiered public/private health care system


2011-03 Francesco Feri, Alessandro Innocenti, Paolo Pin: Psychological pressure in competitive environments: Evidence from a randomized natural experiment: Comment

2011-02 Christian Kleiber, Achim Zeileis: Reproducible Econometric Simulations

2010-29 Matthias Sutter, Martin G. Kocher, Daniela Rützler and Stefan T. Trautmann: Impatience and uncertainty: Experimental decisions predict adolescents’ field behavior

2010-28 Peter Martinsson, Katarina Nordblom, Daniela Rützler and Matthias Sutter: Social preferences during childhood and the role of gender and age - An experiment in Austria and Sweden Revised version forthcoming in Economics Letters

2010-27 Francesco Feri and Anita Gantner: Bargaining or searching for a better price? - An experimental study. Revised version accepted for publication in Games and Economic Behavior

2010-26 Loukas Balafoutas, Martin G. Kocher, Louis Puttermann and Matthias Sutter: Equality, equity and incentives: An experiment

2010-25 Jesús Crespo-Cuaresma and Octavio Fernández Amador: Business cycle convergence in EMU: A second look at the second moment

2010-24 Lorenz Goette, David Huffman, Stephan Meier and Matthias Sutter: Group membership, competition and altruistic versus antisocial punishment: Evidence from randomly assigned army groups Revised version accepted for publication in Management Science

2010-23 Martin Gächter and Engelbert Theurl: Health status convergence at the local level: Empirical evidence from Austria (revised Version March 2011)

2010-22 Jesús Crespo-Cuaresma and Octavio Fernández Amador: Business cycle convergence in the EMU: A first look at the second moment

2010-21 Octavio Fernández-Amador, Josef Baumgartner and Jesús Crespo-Cuaresma: Milking the prices: The role of asymmetries in the price transmission mechanism for milk products in Austria

2010-20 Fredrik Carlsson, Haoran He, Peter Martinsson, Ping Qin and Matthias Sutter: Household decision making in rural China: Using experiments to estimate the influences of spouses

2010-19 Wolfgang Brunauer, Stefan Lang and Nikolaus Umlauf: Modeling house prices using multilevel structured additive regression

2010-18 Martin Gächter and Engelbert Theurl: Socioeconomic environment and mortality: A two-level decomposition by sex and cause of death

2010-17 Boris Maciejovsky, Matthias Sutter, David V. Budescu and Patrick Bernau: Teams make you smarter: Learning and knowledge transfer in auctions and markets by teams and individuals
2010-16 Martin Gächter, Peter Schwazer and Engelbert Theurl: Stronger sex but earlier death: A multi-level socioeconomic analysis of gender differences in mortality in Austria

2010-15 Simon Czermak, Francesco Feri, Daniela Rützler and Matthias Sutter: Strategic sophistication of adolescents - Evidence from experimental normal-form games

2010-14 Matthias Sutter and Daniela Rützler: Gender differences in competition emerge early in live

2010-13 Matthias Sutter, Francesco Feri, Martin G. Kocher, Peter Martinsson, Katarina Nordblom and Daniela Rützler: Social preferences in childhood and adolescence - A large-scale experiment

2010-12 Loukas Balafoutas and Matthias Sutter: Gender, competition and the efficiency of policy interventions

2010-11 Alexander Strasak, Nikolaus Umlauf, Ruth Pfeifer and Stefan Lang: Comparing penalized splines and fractional polynomials for flexible modeling of the effects of continuous predictor variables

2010-10 Wolfgang A. Brunauer, Sebastian Keiler and Stefan Lang: Trading strategies and trading profits in experimental asset markets with cumulative information

2010-09 Thomas Stöckl and Michael Kirchler: Trading strategies and trading profits in experimental asset markets with cumulative information

2010-08 Martin G. Kocher, Marc V. Lenz and Matthias Sutter: Psychological pressure in competitive environments: Evidence from a randomized natural experiment: Comment An extended version with the title “Psychological pressure in competitive environments: New evidence from randomized natural experiments” is forthcoming in Management Science

2010-07 Michael Hanke and Michael Kirchler: Football Championships and Jersey sponsors’ stock prices: An empirical investigation

2010-06 Adrian Beck, Rudolf Kerschbamer, Jianying Qiu and Matthias Sutter: Guilt from promise-breaking and trust in markets for expert services - Theory and experiment

2010-05 Martin Gächter, David A. Savage and Benno Torgler: Retaining the thin blue line: What shapes workers’ intentions not to quit the current work environment

2010-04 Martin Gächter, David A. Savage and Benno Torgler: The relationship between stress, strain and social capital
2010-03 Paul A. Raschky, Reimund Schwarze, Manijeh Schwindt and Ferdinand Zahn: Uncertainty of governmental relief and the crowding out of insurance

2010-02 Matthias Sutter, Simon Czermak and Francesco Feri: Strategic sophistication of individuals and teams in experimental normal-form games

2010-01 Stefan Lang and Nikolaus Umlauf: Applications of multilevel structured additive regression models to insurance data
University of Innsbruck

Working Papers in Economics and Statistics

2011-27

Haoran He, Peter Martinsson, Matthias Sutter

Group Decision Making Under Risk: An Experiment with Student Couples

Abstract
In an experiment, we study risk-taking of cohabitating student couples, finding that couples’ decisions are closer to risk-neutrality than single partners’ decisions. This finding is similar to earlier experiments with randomly assigned groups, corroborating external validity of earlier results.

ISSN 1993-4378 (Print)
ISSN 1993-6885 (Online)