JENA ECONOMIC RESEARCH PAPERS

2013 – 028

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www.jenecon.de

ISSN 1864-7057

The JENA ECONOMIC RESEARCH PAPERS is a joint publication of the Friedrich Schiller University and the Max Planck Institute of Economics, Jena, Germany. For editorial correspondence please contact markus.pasche@uni-jena.de.

Impressum:

Friedrich Schiller University Jena
Carl-Zeiss-Str. 3
D-07743 Jena
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Kahlaische Str. 10
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The effect of identifiability on the relationship between risk attitudes and other-regarding concerns

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Abstract

Previous studies have shown that other-regarding concerns are weakened under risky situations. Daily experience also suggests that people care more about an identifiable than about an unidentifiable third person. We report on an experiment designed to explore whether rendering the other identifiable—via a speechless video and the revelation of personal information—affects the relationship between other-regarding concerns and risk preferences when there is risk to one's own and/or the other's payoff. We find that the acquisition of information about the other has no effect on behavior. Regardless of the treatment, most of the participants are other-regarding with respect to expected payoff but self-oriented with respect to risk allocation.

JEL Classification: C90; D63; D81

Keywords: Risk attitudes; Other-regarding concerns; Identifiability

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1 Introduction

In 2010, in the aftermath of a massive cave-in, thirty-three Chilean miners were trapped nearly half a mile underground. Once a video camera was lowered down a borehole, the film that was relayed to the surface showed live images of the miners and their quarters. Rescuers worked day and night to drill an escape route, although the risk of further collapses made the rescue operation extremely dangerous. Sixty-nine days after the accident, a broadcast of the men being hoisted to freedom captivated the entire world. A natural question to ask is how much did viewing these miners contribute to making their story so engaging?

Mining is, in general, a hazardous operation.[1] People working in this industry are often confronted with choices that entail risk not only to themselves but also to others. While there is some international cooperation toward new regulation and legislative reforms, in many parts of the world little has been done to improve the miners' working conditions and to sustain development after mine closure. The experiment presented in this paper is motivated by the different reactions that, in a risky environment, specific and general others seem to trigger.

There exists a substantial body of evidence showing that people exhibit other-regarding concerns when their own payoffs are certain.[2] Much less is known about the extent of such concerns in situations that involve risk to themselves and/or the others. Additionally, the experimental work studying other-regarding concerns under risk focused on situations where the passive others—whose payoffs hinge on the decision makers' choices—are of unknown identity.[3] The main findings so far are that (a) people tend to be less other-regarding when their own payoffs are at risk rather than certain, and (b) the

[1] China's coal mine fatality rate stood at 10.4 and 8.8 deaths per day in 2007 and 2008, respectively (*China Daily* July 18, 2009).

[2] For a review of the experimental literature see Cooper and Kagel (forthcoming).

[3] A notable exception is Güth et al. (2011).

behavior of other-regarding individuals is influenced by the riskiness of their own payoffs but not by that of the others' payoffs (see, e.g., Brennan et al. 2008; Güth et al. 2008; Bolton and Ockenfels 2010; Güth et al. 2011; Rohde and Rohde 2011; Bolton et al. 2012).[4]

The goal of the present study is to explore whether introducing identifiability of the others extends the kind of social preferences at work under certainty to risky contexts. To shed light on this issue we run three variants of the Brennan et al. (2008) experiment: a decision maker is asked to evaluate four different prospects or allocations, each assigning either a risky or a certain payoff to herself and to another passive participant. Our no-identifiability control treatment replicates the study of Brennan et al. with the difference that here the decision maker and her passive partner are from two different universities: the former is a student at the University of Jena, Germany, and the latter is a student at the University of Trento, Italy. This feature is introduced to preclude the possibility of carry-over or reputation effects (resulting from personal acquaintance and/or potential future interactions outside the laboratory), which could contaminate the participants' incentives and lead to loss of control in the treatments bringing in identifiability.[5]

We manipulate identifiability by giving the passive partner a face and then a name. In one treatment, the so-called "video" treatment, we present the decision maker with a short silent video of her partner. The fact that the latter is no more faceless is expected to generate empathy and to narrow social distance.[6] This, in turn, should enhance pro-social behavior (e.g., Bohnet and Frey 1999a; b; Scharlemann et al. 2001; Burnham 2003; Singer and Fehr 2005; van Winden et al. 2008). We opted for a speechless video, rather than a still

[4]But see Gaudeul (2013) for evidence that participants may be responsive to risk borne by the other in case of negatively and positively correlated social lotteries.

[5]Hey (1991) and Roth (1995), among others, provide several reasons why the interacting parties should not know each other personally.

[6]By "social distance" we mean the emotional proximity which ties oneself to another. The concept of social distance has a long history in the social science literature (Bogardus 1928), where it is presumed to have many different aspects. Economists, however, usually vary social distance by lifting anonymity.

picture, in order to render identifiability more reliable and profound. As we are interested in the effect of identifiability per se, we excluded the linguistic channel, or else our findings could be contaminated by the content of the passive partner's speech. In another treatment, the so-called "video+info" treatment, the display of the video is combined with disclosure of the other's name and hobbies. The extra information should strengthen empathy and further decrease social distance, thereby intensifying the decision maker's feelings of solidarity toward her partner (see, e.g., Bolle 1998; Charness and Gneezy 2008, for findings in line with this conjecture).

In all three treatments, the elicitation procedure is the Becker-DeGroot-Marschak (BDM) mechanism (Becker, Degroot and Marschak 1964). Given that Brennan et al.'s results reveal a significant difference in the valuations of risky prospects in the willingness-to-accept (but not in the willingness-to-pay) treatment, we employ only the willingness-to-accept mode. Thus, in all treatments, each decision maker is endowed with a prospect and is asked to state the minimum price at which she is willing to sell it. By comparing valuations within each treatment we can infer how much the decision maker cares about the other when her own and/or the other's payoffs are at risk. By the same token, a comparison of valuations across treatments should reveal whether and to what extent introducing identifiability may overturn the earlier findings of (a) weaker other-regarding concerns in risky contexts, and (b) no influence of the risk borne by the passive counterpart on the decision maker's behavior.

The rest of the paper is organized as follows. Section 2 provides some background on the literature related to our research and the reasons why identifiability could be effective in risky contexts. Section 3 introduces the different prospects, describes the various treatments, and reports our experimental procedures. Section 4 presents the results. Section 5 summarizes the main points of the study and offers concluding remarks.

2 Background

Before presenting the details of our experiment, we review some relevant literature and outline why we expect identifiability to affect preferences in risky contexts.

2.1 Previous related experiments

Our work combines two different strands of the literature. One strand studies the relationship between risk preferences and other-regarding concerns when one's own and the others' payoffs are risky. The other strand investigates the effects of identifiability on generosity.

In their contribution to the first strand of the literature, Brennan et al. (2008) find that when one's own and the other person's payoffs are risky, other-regarding behavior is influenced by the riskiness of one's own payoff but not by that of the other's payoff. This finding is confirmed by Güth et al. (2008) who extend Brennan et al.'s experiment so as to include deferred outcomes. According to Güth et al., even though decision makers are other-regarding when monetary payoffs are certain and immediate, they disregard the other and focus on their own payoff when the latter is risky and/or could be postponed. The authors attribute this result to cognitive overload, in the sense that risky and/or delayed decision problems tend to crowd out other-regarding concerns. Rohde and Rohde (2011) reach a similar conclusion. In their experiment, each participant repeatedly chooses between lotteries allocating money to herself and ten others. Their findings suggest that risk attitudes are not affected much by risk borne by others, although most individuals show concern for inequality in a risk free setting.

Further experiments exploring risk attitudes in a social context include Bolton and Ockenfels (2010), Bolton et al. (2012), and Harrison et al. (2013). These studies find that people are more reluctant to take a risk when it also affects other individuals, although in Harrison et al. (2013) this holds only when subjects know the others' risk preferences. The influence of risk on other-regarding preferences has also been investigated by Krawczyk and Lec (2010), whose results indicate that participants in a 'probabilistic dictator game' are less generous when sharing probabilities rather than money.[7]

With respect to the second strand of literature that our work is associated with, numerous experiments in the behavioral decision making literature have tested Schelling's (1968) intuition that identifiable targets evoke a stronger emotional and moral reaction than unidentifiable targets (see, e.g., Kogut and Ritov 2005; Small et al. 2007, and references therein). The impact of non-anonymity on benevolent behavior has also been addressed by experimental economists.[8] Bohnet and Frey (1999a; b) use prisoner's dilemma and dictator games to study whether "silent identification suffices to induce a larger degree of solidarity than anonymous conditions" (1999b, p. 46). They find that two-way identification (the group members stand up and look at each other in silence) increases dictator giving and boosts cooperation in a four-person prisoner's dilemma. Moreover, in the dictator game, one-way identification (only the dictators see the recipients) induces more other-regarding behavior than anonymity. Similarly, Scharlemann et al. (2001) observe that photographs of smiling partners yield more cooperation in one-shot trust games, and Burnham (2003) reports that dictators seeing a picture of their recipients are more likely to divide the money equally than dictators who do not know their counterparts.[9] Charness and Gneezy (2008) find that dictators (but not proposers in ultimatum games) are more generous when they know the family name of their counterparts. Finally, in Bolle's (1998) 'rewarding trust' game, the pseudonyms

[7] Trautmann and Vieider (2012) provide a review of the experimental literature assessing how risk taking on behalf of others differs from risk taking for oneself.

[8] Here we review some experiments that manipulate identifiability without allowing for communication among group members. Sally (1995) offers a meta-analysis of social dilemma experiments and shows that enabling people to communicate increases cooperation significantly. Balliet (2010), in a more recent meta-analysis, reports similar results.

[9] On the other hand, in Brosig et al.'s (2003) four-person public goods experiment visual identification has no significant effect on cooperation.

chosen by the first movers influence the second movers' behavior. None of these papers has considered identifiability in conjunction with risky settings, though.

2.2 Why should identifiability matter?

Neither orthodox game theory nor the various models that have been proposed to account for other-regarding behavior (including Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Charness and Rabin 2002; Cox et al. 2007) predict behavioral differences depending on whether the others are identifiable or not. Yet, the social psychology literature suggests that seeing the other may induce the decision maker to adopt her perspective. This is likely to evoke more empathy[10] and to increase the decision maker's willingness to help (here, willingness to keep the prospect). Moreover, identification of the other is believed to reduce social distance and to encourage some level of social responsibility. Akerlof (1997), for instance, lays out a model where social distance is used to explain individual decisions that bear social consequences.

Virtually all studies demonstrating that identifiability boosts other-regarding concerns assume that the involved parties' payoffs are certain. In our experiment this means that the prospect assigning a sure payoff to both parties should be valued more by decision makers who are exposed to a silent video of their passive partner than by decision makers whose partner is faceless. Therefore, even though reservation prices decrease with the introduction of risk in all three treatments, a merely additive effect of the video may be expected if the higher valuation of the risk free prospect in the experimental treatments, compared to the control, shifts upward the valuations of the prospects involving risk (that is, following the introduction of identifiability, the increase in the reservation price of the risky prospects is analogous to the increase in the reservation price of the risk free prospect).

[10] Davis (1994) and Batson et al. (1995), among others, view the adoption of the other's perspective as a necessary condition for the emergence of empathy. On this issue see also Singer and Fehr (2005) who illustrate how sharing other people's feelings generates emphatic responses that can be measured using functional MRI.

Is it possible, as suggested by the real-world example of the introductory paragraph, that when risk pertains to identifiable individuals the results of existing studies that abstract from risk extend to risky contexts?[11] Following Rohde and Rohde (2011), even in the presence of risk, being exposed to a silent video of the other may shift the decision maker's reference point from herself to the other. Furthermore, Hsee and Weber (1997) find that people can more accurately predict the other's risk preferences when the other is vivid (the person sitting nearby) rather than abstract. In our video treatments, it could be that generosity remains unaffected by payoffs becoming risky, the reason being that decision makers are influenced by the payoffs and lotteries faced by the other. We thus hypothesize that identifiability could help overturn earlier findings of no relationship between other-regarding concerns and attitudes toward social risk.

3 The experiment

3.1 Decision task and treatments

To investigate the relationship between other-regarding concerns and risky outcomes, we follow the design introduced by Brennan et al. (2008). Hence, we use the BDM mechanism (Becker et al. 1964) and elicit individual valuations of several prospects. Valuations are defined as reservation prices that a person is willing to accept to forgo a prospect that she owns. Each prospect allocates payoffs both to the decision maker, X, and to another participant, Y. More specifically, each member of the pair receives either a sure payoff u or a lottery ticket U assigning $\underline{U}$ or $\overline{U}$ with 1/2 probability each. The relationship between the different payoffs is given by $0 < \underline{U} < u < \overline{U}$ and $\mathrm{E}[U] = (\underline{U} + \overline{U})/2 = u$.

Let P_{ij} denote the prospect assigning reward i to X and reward j to her

[11] Indeed, many everyday life situations support the idea that individuals are willing to engage in pro-social acts that involve personal risk when the object of their benevolence is identifiable. To name just two examples, people risk their lives to save others from drowning at sea and intervene when others are assaulted in the street.

counterpart Y. We allow for the following four prospects:

P_{uu} : both X and Y get u, i.e., the sure payoff;

P_{uU} : X gets u and Y gets U, i.e., the decision maker gets the sure payoff and her partner faces the lottery;

P_{Uu} : X gets U and Y gets u, i.e., the decision maker faces the lottery and her partner gets the sure payoff;

P_{UU} : both X and Y get U, i.e., they both face the lottery.

The decision maker is asked to submit a minimum selling price for each prospect. Let $b(P_{ij})$ denote X's bid for P_{ij}, where $0 < \underline{b} \leq b(P_{ij}) \leq \overline{b}$. Then a random draw from a uniform distribution determines a price $p \in [\underline{p}, \overline{p}]$ with $0 \leq \underline{p} \leq \underline{U} < \overline{U} \leq \overline{p}$. If $p \geq b(\cdot)$, X sells the prospect and collects the random price p while Y receives nothing. If $p < b(\cdot)$, X keeps the prospect, and she as well as Y obtain a realization of the payoffs specified by the prospect. The riskiness of the final payoff is preserved by imposing $\underline{p} < \underline{b} < \overline{b} < \overline{p}$. Thus, notwithstanding $b(P_{ij}) = \underline{b}$ (or $b(P_{ij}) = \overline{b}$), X can never be sure whether she will keep the prospect or not. A risk-neutral decision maker who cares only about her own payoff should submit $b(P_{ij}) = u = \mathrm{E}[U]$ for each prospect. However, if the decision maker has other regarding preferences and wants to increase the chances of keeping the prospect, then she should report $b(P_{ij}) > u$.

To examine whether and to what extent rendering the passive partner Y identifiable affects the benevolence of decision maker X, valuations of the four prospects are collected under three treatments.

- In the *control treatment*, we ensure complete anonymity between decision makers and passive partners: X submits her bids knowing just that Y is a female student at the University of Trento.

- In the *video treatment*, prior to deciding on $b(P_{ij})$, X watches a short (30 seconds) speechless video of her Trento partner. X is informed that the video portrays the subject labeled Y in the instructions.

- The *video+info treatment* is almost the same as the video treatment, with the extra feature that X gets to know the name and hobbies of her passive partner.

3.2 Procedures

The experiment was programmed in z-Tree (Fischbacher 2007) and conducted in the experimental laboratory of the Max Planck Institute of Economics (Jena, Germany) and the Cognitive and Experimental Economics Laboratory of the University of Trento (Italy). The subjects were undergraduate students. They were recruited using Greiner's (2004) ORSEE software in Jena and flyers in Trento. To avoid possible gender discrimination, participants were (aware to be) only females.[12] In all treatments, the decision maker was from the Friedrich Schiller University of Jena, and the passive partner was from the University of Trento. The participants from Trento were informed, when recruited, that they would be videotaped during the experiment and that the resulting video would be used for scientific purposes only, and it would never be made public.

Upon entering the laboratory, the participants in both locations were randomly assigned to visually isolated computer terminals. The instructions (reproduced in the appendices) were distributed and then read aloud to establish common knowledge. The instructions were the same for all participants regardless of location or role. They specified to the decision makers (passive partners) that the person they were paired with was a female student from the University of Trento (Jena), who had participated (would participate) at an earlier (a later) stage of the experiment. Understanding of the rules was checked by a control questionnaire that subjects had to answer correctly before the experiment started.

The video-clips of the Trento passive players were recorded while the participants were reading the instructions (the Jena decision makers were informed

[12] Some previous experiments, such as Eckel and Wilson (2003) and Meier (2007), have shown that gender can change the nature of other-regarding behavior.

about this). At the end of each Trento session, the participants were paid a €2.50 participation fee and were asked to come back a week later to receive their experimental earnings. If the X-participants doubted the payment of the money to their Y-counterparts in Trento, then their propensity to be other-regarding would be seriously affected.[13] To minimize such doubts we used written assurances attesting that the money would be transferred to the Y-participants.[14]

In order to collect a large number of independent observations per treatment, we used the strategy method for decision makers X. This means that, in all three treatments, each X-participant had to submit four reservation prices, one price for each prospect. We randomized the order in which the four prospects were listed on the subjects' screens so as to control for experimenter demand effects of presentation. At the end of the experiment, one of the four prospects was selected at random and the participants were paid according to their choices for that prospect. If the selected prospect included the lottery and X kept the prospect, then the lottery was played out and the subjects were paid accordingly. In case of P_{UU}, two independent random draws determined the earnings of X and Y.

The parameter values were the same as in Brennan et al. (2008). In particular, $\underline{p}$ and $\overline{p}$, the two bounds of the uniform distribution from which the random prices were selected, amounted to 4 and 50 ECUs (Experimental Currency Unit) respectively, with 1 ECU = €0.25. Decision makers in all treatments could submit any integer value between 8 and 46 ECUs. The prospect's parameters were $u = 27$, $\underline{U} = 16$, and $\overline{U} = 38$.

The three treatments were administered in a between-subjects design. For each treatment we ran one session in Jena and two sessions in Trento. Each Jena session had 32 participants, and each Trento session involved 16 participants. Thus, we have 32 observations on decision makers per treatment. Averaging

[13]See Frohlich et al. (2001) for an experiment testing how doubts regarding the existence of pairings affect the dictators' behavior.

[14]In particular, each Jena decision maker was provided with a guarantee of payment to Y that was signed by an executive of the Max Planck Institute.

over all three treatments, mean earnings amounted to €10.53 for the decision makers and €6.65 for the passive others (inclusive of a €2.5 show-up fee).

4 Results

Figure 1 draws, separately for each treatment, boxplots of bid choices for the various prospects; the number in each box gives the corresponding sample mean. In all treatments, the highest mean reservation price is asked for P_{uu} (the prospect granting a sure payoff to both players). Contrary to our conjecture that an identifiable other would raise the willingness to keep P_{uu}, neither the mean nor the median valuation of the risk free prospect increases in accordance with the amount of information made available to the decision maker (the median bid for P_{uu} is 29.0, 28.5, and 30.0 in the control, video, and video+info treatments, respectively).

[Figure 1 about here.]

As compared to the control treatment, in the treatments with identification the valuations of the three prospects entailing risk are less frequently smaller than the valuation of the risk free prospect.[15] Yet the boxplots in Figure 1 do not suggest that rendering the other identifiable (by either a video or a video and the revelation of personal information) has any major effect on reservation prices. This is confirmed by a series of Kruskal-Wallis rank sum tests: for all four prospects, the null hypothesis that reservation prices in the three treatments are drawn from populations with the same distribution can not be rejected (all p-values ≥ 0.70). Additionally, using Wilcoxon rank sum tests with continuity correction, it is not possible for any prospect to reject the null hypothesis that its reservation prices in any pair of treatments have identical distributions (all p-values ≥ 0.42).

[15] The percentage of participants that post a lower reservation price on P_{uU}, P_{Uu}, and P_{UU} than on P_{uu} is 18.8% (6 out of 32) in both the video and the video+info treatments. This percentage is notably larger in the control treatment, namely 34.4% (11 out of 32).

Table 1 reports the results of a linear mixed-effects regression of reservation prices on a number of dummy variables. *OwnRisk* takes on value 1 if the prospect involves risk for the decision maker (i.e., if $P_{ij} = P_{Uu}$ or P_{UU}) and 0 otherwise; hence it captures how risk to one's own payoff affects valuations. *OtherRisk* takes on value 1 if the prospect involves risk for the other (i.e., if $P_{ij} = P_{uU}$ or P_{UU}) and 0 otherwise, thus capturing how risk to the other's payoff affects valuations. *Video* and *VideoInfo* are treatment dummies: the former equals 1 in the treatment where the decision maker only sees her counterpart; the latter equals 1 in the treatment where the decision maker knows as well the other's name and hobbies. There are two more terms representing the interaction of *OtherRisk* with each of the treatment dummies; they are used to assess whether introducing identifiability changes the decision maker's attitude toward risk borne by the other.

[Table 1 about here.]

Risk, may it be about the payoff of the decision maker or that of her passive partner, reduces reservation prices substantially (the coefficients of *OwnRisk* and *OtherRisk* are negative and significant). We also estimated the model under the restriction that the coefficients of *OwnRisk* and *OtherRisk* are the same; on the basis of the reported χ^2 test, the impact of the former is not significantly different from that of the latter.

The coefficients of *Video* and *VideoInfo* are not statistically significant, which (in line with the results of the non-parametric tests) implies that rendering the other identifiable has no effect on reservation prices per se. Finally, no significant effect is observed for the interaction terms associated with the two treatment dummies, implying that the decision maker's dislike for the risk borne by the passive other is not affected by the way identifiability was manipulated.

4.1 An analysis of types

In this section, we present a detailed analysis of the relationship between risk preferences and other-regarding concerns in each treatment. We define criteria for each attitude we are interested in (thereby identifying various typologies of behavior) and examine how these attitudes relate to each other.

To assess the decision makers' concerns about her partner's earnings, we look at the X-participants' valuations of the prospect granting both parties a sure payoff of 27 ECUs. A decision maker is classified as "other-regarding" if she values P_{uu} at a price higher than 27 ECUs. Conversely, she is classified as "spiteful" if she is willing to accept less than 27 ECUs for P_{uu} (i.e., X is willing to sell the prospect at a price smaller than its face value leaving Y with zero earnings).

In our setting, the difference in reservation prices between P_{uu} and P_{Uu} may reflect the decision maker's own risk preferences and/or her concern about ex post inequality (i.e., inequality that results after lottery U is played out).[16] We refer to the combination of these two factors as *volatility preferences*, and we say that a decision maker is "volatility averse" if $b(P_{uu}) > b(P_{Uu})$ and "volatility seeking" if $b(P_{uu}) < b(P_{Uu})$.

To capture *social orientation toward risk*, we use the difference in reservation prices between P_{Uu} and P_{uU}. These prospects differ in the party that incurs the risk (the decision maker in P_{Uu}, her passive partner in P_{uU}), but yield the same level of ex post inequality: with both prospects, after playing the lottery, the decision maker's payoff is either 11 ECUs higher or 11 ECUs lower than the other's payoff. Thus, the differences between $b(P_{Uu})$ and $b(P_{uU})$ can only be attributed to risk considerations.

Combining X's volatility preferences with her social orientation toward risk, we can identify her as other- or self-oriented with respect to risk allo-

[16]While P_{uu} gives the same payoff of 27 ECU to both parties, P_{Uu} implies that, ex post, the decision maker is either better off (if the lottery outcome is 32) or worse off (if the lottery outcome is 16) than her partner.

cation. In particular, a volatility averse individual with a positive risk social orientation (that is $b(P_{Uu}) - b(P_{uU}) > 0$) is considered risk other-oriented: notwithstanding her aversion to volatility, she prefers keeping a prospect that involves risk for herself than a prospect that involves risk for her partner. Conversely, a volatility averse individual with a negative risk social orientation (that is $b(P_{Uu}) - b(P_{uU}) < 0$) prefers exposing the other, rather than herself, to the lottery and is therefore classified as risk self-oriented. The same reasoning can be applied to volatility seeking individuals, but these are classified as risk other-oriented when $b(P_{Uu}) - b(P_{uU}) < 0$, and risk self-oriented when $b(P_{Uu}) - b(P_{uU}) > 0$.[17]

[Table 2 about here.]

Table 2 summarizes our criteria and reports how many observations correspond to each type. In all three treatments, most participants (a) are classified as other-regarding and volatility averse, and (b) appear to be risk self-oriented whatever their volatility preferences. Interestingly, almost all participants displaying volatility preferences (either aversion or love) exhibit risk social orientations. Given the control over inequality concerns provided by our definition of risk social orientation, this finding suggests that risk preferences play an important role in shaping tendencies toward volatility. Concerning how identifiability affects the distribution of types, Table 2 shows no major differences. Non-parametric tests confirm that there are no significant differences across treatments with regard to the (pooled) distributions of other-regarding types (Fisher's exact tests, all p-values ≥ 0.75) and of risk other-oriented types (Fisher's exact tests, all p-values ≥ 0.67).

We may combine social preferences and risk social orientations to examine how the different attitudes interact. The results are shown in a 3×3 matrix format in Table 3. Each cell reports the frequency counts of decision makers

[17] In this sense, social orientation with respect to the distribution of risk always depends on the fundamental volatility preferences.

that have risk social orientation of the type indicated by the corresponding row label, and concerns toward the other's payoffs of the type indicated by the corresponding column label. We can see that, in all treatments, the vast majority of decision makers are concerned about what the other gets, but tend to be self-oriented when allocating risky prospects. Fisher's exact tests confirm that there is no significant difference in the frequency of the most observed type (other-regarding/risk self-oriented) between treatments (all p-values ≥ 0.80).

[Table 3 about here.]

5 Conclusions and Discussion

Previous experimental studies have demonstrated that people get less other-regarding when payoffs are risky. Laboratory investigation and everyday life experience also suggest that people care more about an identifiable than about an unidentifiable other. This is the first paper to examine the combined effects of risk and identifiability on other-regarding concerns.

We find that rendering the other identifiable, either by showing a speechless video or by complementing such a video with the revelation of personal information, has no major effect on behavior. Both in the control treatment and in the treatments with identification, reservation prices are significantly smaller when there is risk to the actor and/or the other than when the parties' payoffs are common knowledge. Furthermore, our analysis of types reveals that (*i*) participants in the control treatment are other-regarding with respect to the other's expected payoff, but self-oriented with respect to the allocation of risk, and (*ii*) this is unaffected by the extent of identifiability manipulation. Thus, on the one hand, our results confirm previous data indicating that, even for those who are relatively other-regarding, risk borne by the others is much less important than own risk. On the other hand, in contrast to previous studies involving deterministic payoffs, our experiment shows that identifiability is not important in risky contexts.

Why didn't we observe any behavioral change across treatments? We can think of at least two explanations. First, in line with Güth et al.'s (2008) claim, the existence of risky payoffs may have lessened empathy toward identifiable others due to a load in the agents' cognitive system. Second, while our manipulations of identifiability aimed to reduce social distance, they may have not lessened *moral* distance, defined as the degree of moral obligation that the decision maker has toward her passive partner (Aguiar et al. 2008, p. 350). In our video+info treatment, the decision maker knows the other's name and hobbies but lacks information about the other's needs, so that the decision maker is unable to identify the moral nature of her decision. In a dictator game experiment with real payoffs, Aguiar et al. (2008) find that 74.6% of the dictators gave all their money when they knew that the recipients were poor and in need of medicines. Moral obligation seems to be affected not by anonymity, but by the lack of information about the other's actual situations (on this issue, see also Eckel and Grossman 1996, who observe significantly higher donations when an anonymous individual is replaced by an established charity, the American Red Cross). Reducing moral distance between the decision makers and their passive partners may incline the former toward kindness in risky contexts, hence changing the way they react to risk borne by the others. Only future research, exploring settings where moral distance is null, is likely to reveal whether this justification for our findings is well-grounded or not.

Appendix A. Instructions for X-participants (originally in German)

Welcome and thank you for participating in this experiment. Please remain silent and switch off your mobile! You will receive €2.50 for having shown up on time. Please read the following instructions carefully. From now on any communication with other participants is forbidden. If you have any questions or concerns, please raise your hand. Your earnings in the experiment will be specified in ECU (Experimental Currency Unit) where 1 ECU = €0.25.

Detailed information on the experiment

In this experiment, each of you will be paired with another person. This person is a female student from the University of Trento in Italy. In the following we will refer to the person you are matched with as Y. Y-participants participated in this experiment earlier in the Trento experimental lab. [*Participants in the "video" and "video+info" treatments read:* They have been recorded while reading the instructions. Before you make your decisions, you will watch a video clip of the Y member of your pair.] [*Participants in the "video+info" treatment read:* Moreover, you will get to know the name of your matched Y-participant, and her hobbies.]

You – as well as all other Jena University participants – will face 4 different prospects. Each prospect pays to you and Y some positive amounts of ECU. These payments can be either *certain* or *uncertain*.

- The *certain payment* gives 27 ECU for sure.
- The *uncertain payment* consists of a lottery giving either 16 ECU or 38 ECU, where both amounts are equally likely.

The 4 prospects that you will face are the following:

1. You get 27 ECU for sure and Y gets the lottery.
2. You get the lottery and Y gets 27 ECU for sure.
3. Both you and Y get 27 ECU for sure.

4. Both you and Y get the lottery.

Your task

Your task is to report the lowest amount of ECU for which you would be willing to sell each prospect. In other words, you have to state a **minimum selling price** for each of the four prospects. Each of your four choices must be not smaller than 8 ECU and not greater than 46 ECU. Furthermore, it must be an integer number (i.e., 8, 9, . . ., 45, 46).

Y-participants' task

When Y participated in this experiment, she read the instructions but did not make any decision. Y was informed to be a "non-active" member of the pair. Therefore, she has not received any payment yet. How much your matched Y-participant will earn depends on your decisions about the prospects (you will learn more on the computation of the payoffs below).

Payoffs

The payoffs of both pair members depend on the choices made by you and on two random choices made by the computer. More specifically, once you have made your choices, the computer will select

1. one of the four prospects as the *relevant prospect*, where all four prospects are equally likely;
2. a *random integer* between 4 and 50, where all numbers from 4 to 50 are equally likely. You can think of this choice as drawing a ball from a bingo cage containing 47 balls numbered 4, 5, . . . , 50.

The final payoffs of both you and Y are computed by comparing the *random integer* to the minimum selling price you reported for the *relevant prospect*.

- If the *random integer* is smaller than the minimum selling price that you reported for the *relevant prospect*, you keep the *relevant prospect* and both you and Y obtain the payments specified by it.

- If the *random integer* is equal to or greater than the minimum selling price that you reported for the *relevant prospect*, you sell the *relevant prospect* and earn an amount of ECU equal to the *random integer*. In this case, Y earns nothing.

If the *relevant prospect* consists of a lottery, the lottery will be played for real, meaning that you and/or Y will earn, with equal probability, either 16 or 38 ECU.

Example

Suppose that the prospect paying to you 27 ECU for sure and to Y either 16 or 38 ECU is the *relevant prospect*, and that you have reported a minimum selling price of 20 ECU for that particular prospect.

- If the computer chooses the *random integer* 18, you keep the prospect (because $18 < 20$). This implies that you earn 27 ECU and Y obtains either 16 or 38 ECU, where these two amounts are equally likely.
- If the computer chooses the *random integer* 22, you sell the prospect (because $22 > 20$). This implies that you earn 22 ECU and Y earns nothing.

Notice that the numbers in the example are just for illustrative purposes. They DO NOT intend to suggest which minimum selling price you should report.

On the experimenter desk you can find a guarantee of payment to Y-participants. This guarantee is signed by an executive representative of the Max Planck Institute. At the end of the experiment, you can, if you wish, take a look at this guarantee.

Before the experiment starts, you will have to answer some control questions to verify your understanding of the rules of the experiment.

Please remain quietly seated until the experiment starts. Please raise your hand now if you have questions.

Appendix B. Instructions for Y-participants (originally in Italian)

We ran six sessions in Trento on October 14, 2009. Each session had 16 participants. The instructions reported in Appendix A were adapted for Ys. The main differences were in the following paragraphs.

After the heading "Detailed information on the experiment", the first sentence read:

In this experiment, each of you will be paired with another person. This person is a female student from the University of Jena in Germany. In the following we will refer to the person you are matched with as X. X-participants will participate in this experiment on October 21 in the Jena experimental lab.

The paragraph titled "Your task" read:

You are a "non-active" member of the pair, meaning that you have no decision to make. How much you will earn depends on the decisions about the prospects of your matched X-participant (you will learn more on the computation of the payoffs below).

The last three paragraphs (after the "Example") were replaced by:

You will now receive €2.50 for having participated in the experiment. You will have to come back on Thursday, October 22, at ... [*the time differed across sessions*] to receive your experimental earnings, which will depend on X's decisions.

Please raise your hand now if you have questions.

Appendix C. Control questions

To ensure that the payoff scheme is entirely clear to you, please be so kind as to answer the following questions. The numbers in the questions DO NOT intend to suggest which minimum selling prices you should report.

Question 1

Suppose that:

a) The prospect paying to you either 16 or 38 ECU and to Y 27 ECU for sure is the relevant prospect.

b) You reported a minimum selling price of 25 ECU for that particular prospect.

c) The computer chooses the integer 25.

d) The computer determines that the outcome of the lottery is 16.

Please calculate your and Y's payoffs in this case.

Question 2

Suppose that:

a) The prospect paying to both you and Y 27 ECU for sure is the relevant prospect.

b) You reported a minimum selling price of 33 ECU for that particular prospect.

c) The computer chooses the integer 13.

Please calculate your and Y's payoffs in this case.

Question 3

Suppose that:

a) The prospect paying to both you and Y 27 ECU for sure is the relevant prospect.

b) You reported a minimum selling price of 22 ECU for that particular prospect.

c) The computer chooses the integer 24.

Please calculate your and Y's payoffs in this case.

Question 4

Suppose that:

a) The prospect paying to both you and Y either 16 or 38 ECU is the relevant prospect.

b) You reported a minimum selling price of 30 ECU for that particular prospect.

c) The computer chooses the integer 24.

d) The computer determines that the outcomes of the lottery are: 38 for you and 16 for Y.

Please calculate your and Y's payoffs in this case.

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Table 1: Linear mixed-effects regression on reservation prices.

	Coefficient	Standard Error
Intercept	31.693***	1.431
OwnRisk	−2.167*	0.849
OtherRisk	−2.552*	1.200
OwnRisk × *OtherRisk*	1.073	1.200
Video	0.062	1.933
VideoInfo	−0.172	1.933
OtherRisk × *Video*	1.375	1.470
OtherRisk × *VideoInfo*	1.625	1.470
Linear restriction test		
OwnRisk = *OtherRisk* [χ^2 (p-value)]: 0.103 (0.748)		

Notes: N (groups): 384 (96). Significance levels: * = 5%; *** = 0.1%.

Table 2: Criteria of individual attitudes toward payoff and risk, and attitude (relative) frequencies in each of the three treatments.

Attitude	Description	Control	Video	Video+info
Other-regarding	$b(P_{uu}) > u$	22 (68.7%)	23 (71.9%)	23 (71.9%)
Spiteful	$b(P_{uu}) < u$	5 (15.6%)	5 (15.6%)	7 (21.9%)
Self-seeking	$b(P_{uu}) = u$	5 (15.6%)	4 (12.5%)	2 (6.2%)
Volatility-averse	$b(P_{uu}) > b(P_{Uu})$	16 (50.0%)	19 (59.4%)	14 (43.7%)
– risk other-oriented	$b(P_{Uu}) > b(P_{uU})$	2 (12.5%)	3 (15.7%)	1 (7.1%)
– risk self-oriented	$b(P_{Uu}) < b(P_{uU})$	13 (81.2%)	15 (78.9%)	13 (92.9%)
Volatility-seeker	$b(P_{uu}) < b(P_{Uu})$	14 (43.7%)	7 (21.9%)	10 (31.3%)
– risk other-oriented	$b(P_{Uu}) < b(P_{uU})$	2 (14.3%)	1 (14.3%)	1 (10.0%)
– risk self-oriented	$b(P_{Uu}) > b(P_{uU})$	11 (78.6%)	6 (85.7%)	9 (90.0%)
Volatility-neutral	$b(P_{uu}) = b(P_{Uu})$	2 (6.3%)	6 (18.7%)	8 (25.0%)

Note: We do not report the neutral risk social orientation cases in which $b(P_{Uu}) = b(P_{uU})$.

Table 3: Interaction between risk social orientations (rows) and concerns toward the other's payoffs (columns) in each treatment.

Control					**Video**					**Video+info**				
		Social preferences					Social preferences					Social preferences		
		NE	OR	SP			NE	OR	SP			NE	OR	SP
risk	NE	1	2	1	risk	NE	2	3	2	risk	NE	1	5	2
	OO	0	2	2		OO	0	4	0		OO	0	1	1
	SO	4	18	2		SO	2	16	3		SO	1	17	4

Note: NE = neutral; OR = other-regarding; SP = spiteful; OO = risk other-oriented; SO = risk self-oriented.

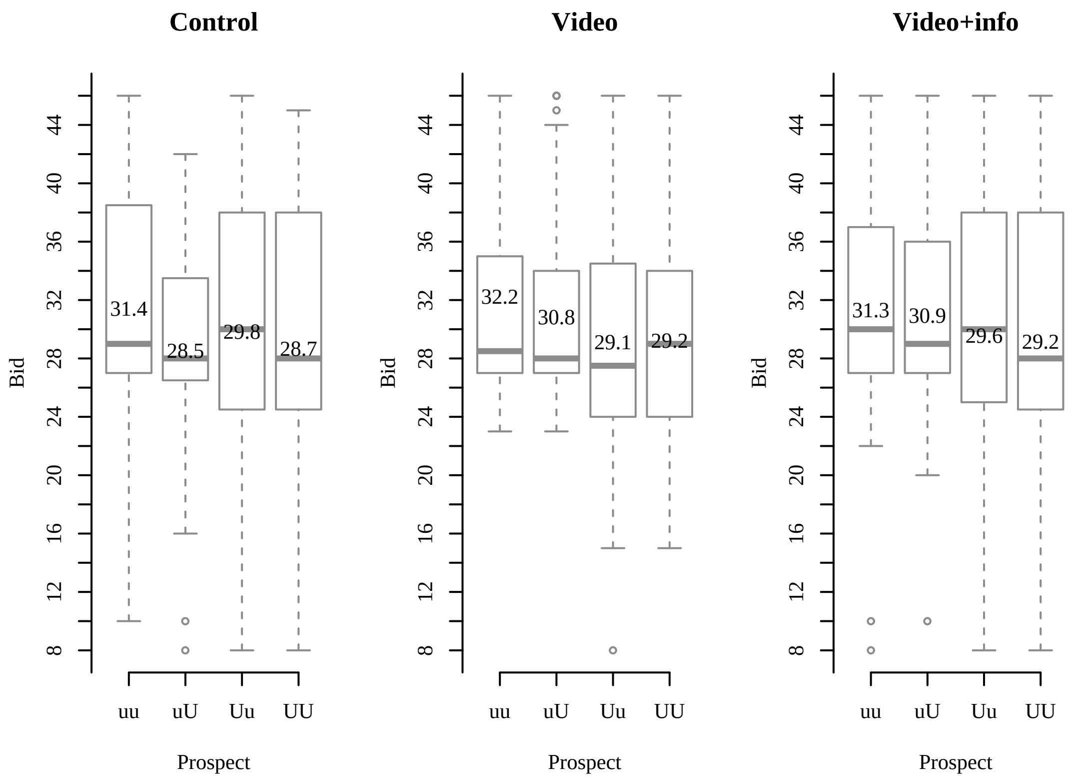

Figure 1: Boxplots of reservation prices for the four prospects in each of the three treatments.