Luck, Choice and Responsibility

– An Experimental Study of Fairness Views

Johanna Mollerstrom[†]

Bjørn-Atle Reme[‡]

Erik Ø. Sørensen[§]

Abstract: We conduct laboratory experiments where third-party spectators have the opportunity to redistribute resources between two agents, thereby eliminating inequality and offsetting the consequences of controllable and uncontrollable luck. Some spectators go to the limits and equalize either all or no inequalities, but many follow an interior allocation rule. These interior allocators regard an agent's *choices* as more important than the *cause* of her low income and do not always compensate bad uncontrollable luck. Instead, they condition such compensation on the agent's decision regarding controllable luck exposure, even though the two types of luck are independent. This allocation rule is previously unaccounted for by the fairness views in the literature. Moreover, its policy implications are fundamentally different in that it extends individual responsibility for choices made to also apply to areas that were not affected by these choices.

Key words: inequality, fairness, responsibility, option luck, brute luck, experiment.

JEL codes: C91, D63, D81, H23.

[†]George Mason University, Fairfax, VA, and Research Institute for Industrial Economics, Stockholm, Sweden. Email: jmollers@gmu.edu, phone: +1 617 850 5561. Corresponding author.

[‡]Telenor Research, Oslo, Norway and Norwegian School of Economics, Bergen, Norway.

[§]Norwegian School of Economics, Bergen, Norway.

1. Introduction

When is inequality between people acceptable and when should it be reduced or eliminated? What constitutes a fair distribution of resources? These questions have been contemplated for centuries and remain at the forefront of both the academic and the public debate. They are interesting in their own right, but their importance is increased as they have implications for numerous related phenomena, such as the design of redistributive tax policies (Alesina and Angeletos, 2005; Krawczyk, 2010) and bargaining behavior (Gächter and Riedl, 2005, 2006). In this paper we study inequality preferences in risky environments and ask how people's fairness ideals differentiate between situations involving bad luck that stems from a choice (bad *option luck*) and those involving bad luck stemming from randomness that cannot be avoided (bad *brute luck*).

Option luck is "a matter of how deliberate and calculated gambles turn out – whether someone gains or loses through accepting an isolated risk he or she […] might have declined" (Dworkin, 2000, p. 73). Brute luck, on the other hand is "a matter of how risks fall out that are not in that sense deliberate gambles" (ibid). For example: if a person goes blind as a result of a genetic condition, her brute luck is bad, but if she buys a lottery ticket and wins, her option luck is good (Lippert-Rasmussen, 2001).

In the laboratory experiments reported in this paper we investigate how a disinterested third party (a *spectator*) divides resources between two other agents. We specifically consider the case where the resources to be divided are generated through a risky process which the agents can only partly control – i.e. both option and brute luck are present. Based on previous research, we expect (and confirm) that a significant fraction of spectators either *always* equalize inequalities between the two agents (i.e. they are *strict egalitarians*) or they *never* do (i.e. they are *libertarians*).[1]

The focus of this paper is, however, on the many people who are interior allocators and *sometimes*, but not always, choose to eliminate inequality. In both the normative and the descriptive literature on social preferences, a popular candidate for this intermediate norm is one that conditions compensation for a bad outcome on its *cause*. More specifically, this norm states that a fair distribution of resources should even out inequalities that do not reflect choices that an agent has made, and over which she therefore lacked control.

This norm is often referred to as *luck egalitarianism* (canonical philosophy texts are Arneson, 1989; Cohen, 1989; Dworkin, 2000). This norm has also been studied in economics by for example Konow (1996) who calls it the *accountability principle*. In his words, "the Accountability Principle […] requires that a person's fair allocation (e.g. of income) vary in proportion to the relevant variables that he can influence (e.g. work effort) but not according to those that he cannot reasonably influence (e.g. a physical handicap)" (Konow, 1996, p. 13).

Empirical research has indicated that luck egalitarianism provides a good description of people's actual distributive behavior. One example can be found in Konow (2000). He shows in a laboratory experiment that when the resources that are to be divided are generated randomly, outside the control of the agents, disinterested spectators almost always implement an equal split.

[1] Strict egalitarianism and libertarianism are similar, although not always identical, to the notions of ex-post and ex-ante egalitarianism respectively, see for example Cappelen et al. (2007, 2013). In the particular experimental design described here, the behavioral predictions of strict egalitarianism and ex-post egalitarianism overlap as do the behavioral predictions of libertarianism and ex-ante egalitarianism.

However, when the resources come about through effort of the agents, Konow finds that the spectators' split is proportional to the agents' respective effort levels.[2]

A key assumption underlying luck egalitarianism is that uncontrollable and controllable factors are treated separately. This means that agents should not be held responsible for behavior that did not cause or influence the outcome. However, this assumption has to our knowledge never been explicitly tested. The reason is that previous experimental designs, including the one used by Konow (2000), have not allowed for situations in which the spectator is aware of the agents' actions regarding *controllable* factors at the same time as it turns out that only *uncontrollable* factors mattered for the outcome.

Our experimental design solves this problem by having both controllable option luck and uncontrollable brute luck present and easily distinguishable. For a spectator who behaves in accordance with luck egalitarianism, a fair distribution only holds agents responsible for outcomes that they could control. In our experiment this would imply that she compensates agents for bad outcomes that are due to bad brute luck but not those that are due to bad option luck.

This is, however, not the behavior we find. Instead, a large share of spectators makes bad brute luck compensation conditional on how the agent handles option luck. These spectators only compensate an agent who experiences bad brute luck when she also avoided exposure to option luck, even though the outcome would not have been affected if the agent had made a different option luck decision. This behavior is inconsistent with fairness views where the definition of a fair distribution depends on the cause of the outcome. Instead, it suggests a fairness view that is

[2] For other experimental investigations related to luck egalitarianism and the accountability principle, see e.g. Schokkeart and Devooght (2003), Becker (2013) and Akbas, Ariely, and Yüksel (2014).

agency dependent and conditional on aspects of the agents' *choices*, regardless of whether these mattered for the outcome or not. We call this norm *choice compensation*.[3]

We use a choice model to estimate which share of spectators adhere to the different fairness ideals. We find that our data is well explained by a model with three types, with about a third of spectators being strict egalitarians, libertarians and choice compensators, respectively. We find very limited support for luck egalitarian behavior among the spectators.

Our results can be related to those of Cappelen et al. (2013), who also study fairness views in circumstances involving risk taking. They find support for a fairness norm that endorses redistribution between people who make the same decision regarding risk exposure. However, as their design has only controllable option luck present they cannot test, as we do, the extent to which an agent's responsibility for a choice made in a controllable situation carries over into an uncontrollable context in which the choice was irrelevant.[4]

The paper proceeds as follows. Section 2 presents the experimental design. Section 3 investigates how agents' bad brute luck is compensated (or not) by the spectators in the experiment. Section 4 provides a model of the distributive choices made in the experiment and presents

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[3] In the philosophical literature there are two approaches in the theory of ”responsibility-sensitive egalitarianism”: one where responsibility is ascribed on the basis of control (here we find luck egalitarianism and the accountability principle), and one where individuals are held responsible for their preferences (even when these are not entirely under their control). To the extent that a choice is regarded as revealing a person's general preferences also in areas that were not directly impacted by the choice, a choice conditioning behavior can be related to this strand of responsibility-sensitive egalitarianism. This topic is extensively discussed by for example Fleurbaey (2008) but has to our knowledge not been empirically assessed.

[4] The results can possibly also be informative regarding under which conditions process, as opposed to outcome, fairness is most important to spectators. Cf. Trautmann and Wakker (2010).

the result of a maximum likelihood estimation of which behavioral types that can be found among our spectators. Section 5 describes an experimental extension that tests, and verifies, the robustness of our results. Section 6 concludes.

2. Experimental Design

Each experimental session was identical and consisted of two parts, with all subjects participating in both parts.[5] In the first part all participants were informed that they each had been allocated an endowment of $24. They were told that at the end of part 1, one of three equally probable events would be drawn: A, B or C. If event A would be drawn for a participant, she would keep her endowment. If event B or C were drawn, she would lose her endowment.

Before the events were drawn, all participants were given a choice about whether or not to buy an insurance that would protect against the loss associated with event B. This insurance would not protect the agent against the loss associated with event C. Participants were informed that the price of the insurance would be $12, but that this would only have to be paid if the participant ended up keeping her endowment (this was done in order to ensure positive payoffs for participants). This implies that a participant who chose to insure against event B would end up with $12 if event A or B were drawn (she would then keep the endowment of $24 and pay the cost

[5] Participants were told at the beginning of the session that there would be several parts and that instructions would be given for one part at a time, ahead of that part. Experimental instructions and selected screen shots can be found in the Online Appendix.

of the insurance) but nothing if event C was drawn. A participant who chose not to insure would get $24 if event A was drawn, and nothing if event B or C were drawn.[6]

The fact that agents could insure against only one source of loss gave rise to a situation where both uncontrollable and controllable elements were present. As it was impossible to eliminate the risk associated with event C, this event constituted bad brute luck in our experiment. On the other hand, the optional insurance against the loss associated with event B guaranteed the presence of option luck.

After the participants had decided whether or not to buy the insurance, they were informed that an event had been drawn for them that would be revealed at the end of the experiment. Thereafter, part 2 of the experiment started in which participants were randomly paired. They were told that they were to make choices regarding the distribution of income from part 1 for another pair of participants referred to as Person 1 (P1) and Person 2 (P2). Moreover, they were told that this choice would have no monetary consequences for themselves, i.e. they were making decisions as a disinterested spectator for another pair.[7]

[6] Note that the insurance offered to the participants was actuarially fair as the expected value was $8 regardless of whether insurance was bought or not. Participants were explicitly pointed to this fact. The design choice to have a fair insurance was made in order to avoid concerns regarding an efficiency loss related to the insurance. A variation in the cost of insurance would constitute an interesting avenue for future research (however, it should be noted that Cappelen et al., 2013, find, in a related setting but with only option luck present, that the price of the insurance does not matter for redistributive choices).

[7] Previous research on social and distributive preferences has studied the behavior of both stakeholders (Fehr and Schmidt, 1999; Cherry, Frykblom and Shogre, 2002; Engelmann and Strobel, 2004; Cappelen et al., 2007; Frohlich, Oppenheimer and Kurki, 2004) and disinterested spectators (Charness and Rabin, 2002; Engelmann and Strobel, 2004; Konow, 2000, 2009). Cappelen et al. (2013) find that agents' behavior is fundamentally determined by the same

The strategy method was used and each spectator saw, and made decisions in, several situations involving P1 and P2. In each situation the spectator was informed about the insurance choices, the events drawn and the earnings for both participants in the pair (we refer to a combination of an event and a choice as an *outcome*). There were two spectators matched to each pair and participants were told that one of the two spectators' choices would be randomly chosen and implemented for the pair.

All spectators made distribution decisions in the 11 situations summarized in Table 1. These situations were chosen as they constitute all possible outcomes from part 1 that resulted in unequal earnings between P1 and P2. (For expositional ease, this table presents the situations such as P1 always has higher earnings than P2 from part 2. In the experiment this ordering was not imposed – see Online Appendix for further details.)

In each situation the spectator had to decide whether to leave earnings unchanged, or to equalize them.[8] This choice was designed to be binary for the experiment to be simple and

principles regardless of whether they act as stakeholder or spectators but Aguiar, Becker and Miller (2013) find that this is not the case. In order to investigate whether our results would be different if the spectators had themselves not made the insurance decision, we also conducted a version of our experiment where the roles were separated and participants made decisions in either part 1 *or* in part 2. The details of this version of the experiment are reported in Section 5 where we show that all conclusions drawn from the main experiment remain valid also in such a setting. Section 5 also investigates the relation, in the original experiment, between the spectators' own insurance decision and her choice of whether or not to equalize outcomes for other participants.

[8] If a pair ended up in a situation that was not covered by these 11 situations, i.e. a situation where they ended up with the same amount, a twelfth situation was added for the spectators matched to them which displayed what the two participants were actually experiencing. The two options (equalizing earnings or leaving them unchanged) then coincided, and hence the spectator just had one option. This twelfth situation was nevertheless shown in order to make

transparent to participants, and in order to focus on the question of when earnings should be equalized and when they should be left unchanged.

Table 1
The 11 Decisions

Situation	Outcome from part 1 (P1 , P2)	Earnings from part 1 (P1 , P2)
1	A , B	24 , 0
2	A , C	24 , 0
3	A , B^{IN}	24 , 12
4	B^{IN}, C^{IN}	12 , 0
5	A , C^{IN}	24 , 0
6	B^{IN}, C	12 , 0
7	B^{IN}, B	12 , 0
8	A^{IN}, C	12 , 0
9	A , A^{IN}	24 , 12
10	A^{IN}, C^{IN}	12 , 0
11	A^{IN}, B	12 , 0

Superscript "IN" indicates that the participant chose to buy the insurance against the loss associated with event B. For expositional ease this table presents the situations such that P1 always has higher earnings than P2 from part 1. In the experiment this ordering was not imposed (see Online Appendix B).

The spectators saw, and made decisions in, the situations one at a time in the order outlined in the table. After every third choice they were showed a summary of the three most recent decisions (the summary screen after the last choice only showed the most recent two choices). The

sure that it was always true that the division was decided by the spectators matched to the pair. Note that it was still not possible for the spectators to know which situation had occurred for their matched pair since the number of situations was not announced in advance.

spectators then had the opportunity to revise their decisions if they so desired or to simply confirm the original decision.[9]

After participants had made decisions in the 11 situations they were presented with their earnings and answered an unincentivized questionnaire.[10]

2.1. Implementation

The experiment was conducted at the Computer Lab for Experimental Research (CLER) at the Harvard Business School in August and September 2012. Subjects were recruited from the laboratory's subject pool, which mainly consists of students from the Boston area. A total of 152 people, who could only take part once, participated (average age 24 years, 49 percent females). They were rewarded with on average $20 (including a fixed show-up fee) for their participation in a session that lasted approximately 40 minutes.

The experiment was computerized using the experimental software z-Tree (Fischbacher, 2007). In order to ensure common knowledge, the experimenter read the instructions out loud in addition to them being given on the participants' computer screens. A summary of the instructions

[9] We gave participants this option in order to provide an additional opportunity for them to contemplate their choice. The option was not widely used: only 4.2 percent of decisions were changed on the summary screens. No results reported here are sensitive to using only original choices, see Online Appendix D. The summary screens for the first 11 decisions were separate from the 12th decision and the summary screen for that (which was only presented to some participants, see above).

[10] The post-experimental questionnaire contained demographic questions, a question about how important fairness considerations were when making the decision about how to split earnings between the two people in the pair, and a question about personal risk preferences. Data from the questionnaire are presented in the Appendix.

was also provided on paper. On two occasions (before the start of each of the two parts) participants had to correctly answer a quiz on the instructions in order to be able to continue. Only very few participants experienced problems with the questions (and all results are robust to excluding these observations, see Online Appendix D), but those who did were provided with repeated instructions by the experimenter. These quizzes were implemented in order to minimize the risk that subject confusion would obscure any results.

3. Situations With and Without Bad Brute Luck

We start by considering the insurance choice that participants made in the first part of the experiment. We conclude that there was significant variation in insurance choice as 120 participants chose to insure whereas 32 did not. This, in turn, is important as it validates our interpretation of both option and brute luck being present in the experiment.

We next look at the participants' choices when acting as spectators in part 2 of the experiment. Considering again the situations that the spectators faced, which are outlined in Table 1, we note that situations 2, 4, 5, 6, 8, and 10 involved bad brute luck. In these situations event C, against which it was not possible to insure, was drawn for one person in the pair. In Table 2 we investigate which fraction of the spectators decided to equalize earnings between P1 and P2 in these situations and compare this to their behavior in the remaining situations, which did not involve bad brute luck. In situations without bad brute luck, 41.1 percent of spectators' choices were equalizing compared to 50.5 percent in situations with bad brute luck (this difference is highly statistically significant, $p < 0.01$[11]). Specifications 2 and 4 in Table 2 show that this conclusion

[11] All p-values reported are from t-tests with standard errors clustered on participant level.

holds also when we control for the absolute size of the difference in output between P1 and P2. Specifications 2 and 4 also show a nonlinear pattern in the controls for the size of the earnings gap. This may seem counterintuitive at first, but is a reflection of the fact that these regressions do not control for insurance choice, and that this insurance choice is important in order to fully capture the fairness considerations of the observers – something that we return to below.

Table 2
Factors Behind Equalizing Splits

	OLS		Logit	
	(1)	(2)	(3)	(4)
Bad brute luck	0.094***	0.191***	0.093***	0.194***
	(0.017)	(0.021)	(0.017)	(0.022)
Earnings = (12, 0)		-0.201***		-0.197***
		(0.027)		(0.025)
Earnings = (24, 12)		0.109***		0.110***
		(0.037)		(0.036)
Constant	0.411***	0.447***		
	(0.028)	(0.035)		
N (obs)	1672	1672	1672	1672
N (cluster)	152	152	152	152

Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The table shows results of a regression where the dependent variable is a dummy equal to 1 if an equal split was chosen and 0 otherwise. Specifications (1) and (2) are Ordinary Least Square (OLS) whereas (3) and (4) show average marginal effect from logit regressions. Bad brute luck is a dummy equal to 1 if event C happened to any of the two persons in the pair, and 0 otherwise. "Earnings = (12, 0)" is a dummy equal to 1 if the outcome was 12 to person 1 and 0 to person 2. "Earnings = (24, 12)" is a dummy equal to 1 if the outcome was 24 to person 1 and 12 to person 2. The reference outcome is hence 24 to person 1 and 0 to person 2. Standard errors are clustered at spectator level.

The fact that we find more redistribution when bad brute luck was causing the outcome means that we, at least at an aggregate level, replicate the finding from previous studies that there is more redistribution of resources in situations that involve elements that are outside the control of the agents. This could easily be interpreted as an indication that a significant proportion of the spectators follow a norm where they compensate agents for outcomes that are due to bad brute luck but not for those due to bad option luck, i.e. that many spectators are luck egalitarians. As an illustration, note that if our sample would consist of approximately 40 percent strict egalitarians, 50 percent libertarians and 10 percent luck egalitarians, the pattern from Table 2 is what we would expect.

We now turn to investigating whether spectators treat brute and option luck separately. Table 3 displays the data from all choices the spectators made. In order to better understand how the spectators handled situations where one of the agents suffered bad brute luck, we utilize the fact that the six situations involving bad brute luck can be divided into three pairs where the insurance choice of P1 and the outcomes for both P1 and P2 from part 1 are held constant. The only thing that differs between the two situations in each pair is whether P2 bought insurance or not.

Table 3
Spectator Behavior, by Situation

Situation	Outcome from part 1 (P1 , P2)	Earnings from part 1 (P1 , P2)	Percent equalized earnings
1	A , B	24 , 0	50.0 (4.07)
2	A , C	24 , 0	49.3 (4.07)
3	A , B^{IN}	24 , 12	54.6 (4.05)
4	B^{IN}, C^{IN}	12 , 0	62.5 (3.94)
5	A , C^{IN}	24 , 0	73.0 (3.61)
6	B^{IN}, C	12 , 0	27.0 (3.61)
7	B^{IN}, B	12 , 0	23.0 (3.42)
8	A^{IN}, C	12 , 0	27.0 (3.61)
9	A , A^{IN}	24 , 12	56.6 (4.03)
10	A^{IN}, C^{IN}	12 , 0	63.8 (3.91)
11	A^{IN}, B	12 , 0	21.1 (3.31)

Superscript "IN" indicates that the participant chose to buy the insurance against the loss associated with event B. For expositional ease this table presents the situations such that P1 always has higher earnings than P2 from part 1. In the experiment this ordering was not imposed. The last column indicates what share, in percentages, of spectators choose to equalize payments in a given situation. Robust standard error in parentheses. N=152.

Consider first situations 2 and 5. In situation 2, P1 chose not to insure and in part 1 event A was randomly drawn for her, leaving her with \$24. The circumstances for P1 were the same in situation 5. In both situations, the event that was drawn for P2 was C, i.e. the event that it was not possible to insure against, leaving P2 with no earnings from part 1. However, in situation 2, P2 had not insured against the loss associated with event B, whereas in situation 5 she bought this insurance. As is evident from the table, this made a significant difference with regards to whether earnings were equalized or not. Whereas just below half of the spectators (49.3 percent) equalized earnings in situation 2, 73 percent did so in situation 5, a difference that is highly statistically significant ($p < 0.01$).

We now turn to situations 4 and 6. In these two situations P1 chose to insure, and got a draw of event B, leaving her with $12 from the first part. P2 again got a draw of C, but had chosen to insure against the loss associated with event B in only one of the two situations. Again, spectators were significantly more willing to equalize earnings in the situation where P2 chose to buy the insurance (62.5 percent) compared to the situation where she did not (27.0 percent) ($p < 0.01$). A similar pattern can be found in situations 8 and 10, with 63.8 percent of spectators equalizing payoffs when P2 had bought the insurance compared to 27.0 percent when she chose not to insure ($p < 0.01$).

From this we can conclude that situations where inequality had arisen because of an event of bad brute luck were treated very differently depending on which choice the agent who was subject to the bad brute luck made regarding exposure to option luck, i.e. if she had bought the insurance protecting her from the loss associated with event B or not. This was so even though this decision was irrelevant for the inequality at hand.

To summarize, we see that the uncontrollable and controllable situations are not treated separately in the way that luck egalitarianism, which conditions compensation for bad outcomes on their cause, assumes. Instead, the reason that earnings in situations involving bad brute luck on average are equalized to a large extent seems to be that many spectators compensate *some* instances of brute luck, namely those where the agent chose to minimize exposure to the risk associated with option luck. This, in turn, leads us to conclude that it may be more appropriate to describe these spectators as "choice compensators", conditioning compensation for low earnings on an agent's *choice* to minimize exposure to option luck, rather than on which event that actually *caused* the low earnings.

4. Estimation of Behavioral Types

4.1. Conceptual Framework

All distributive decisions in the experiment were made by spectators without any monetary self-interest in the distribution of pay-offs. We follow Cappelen et al. (2013) and assume a model in which a spectator incurs an internal cost when the amount y that she allocates to an agent deviates from F^k, i.e. from what the fair allocation would be according to the spectator's fairness ideal k, (the argument denoted by the dot after the semicolon represents individual-level heterogeneity):

$$V(y;\cdot) = -f(y, F^k;\cdot). \tag{1}$$

We assume that the cost of acting unfairly is increasing in the absolute value of the difference between what an agent is allocated and what her fair income would be, and focus on the case where the loss function in equation (1) is quadratic. The (trivial) solution to the spectator's optimization problem is then given by $y^* = F^k$.

Building on previous research, we hypothesize that some spectators are strict egalitarians (SE) and always want to equalize outcomes whereas some are libertarians (L) and never want to do so. In the setting of our experiment we then get that the fair allocation to P1 (which implicitly also defines the fair allocation to P2) for these spectators are:

$$F_1^{SE} = \frac{x_1 + x_2}{2}, \tag{2}$$

$$F_1^L = x_1, \tag{3}$$

where x_i denotes person i's earnings from part 1.

We also expect there to be spectators whose behavior fall in neither of these extreme categories. One alternative intermediate norm is luck egalitarianism (LE). More precisely, such a spectator compensates when the low income is caused by bad brute luck and then only compensates the part that was due to the bad brute luck, neutralizing the role of option luck.

To define the luck egalitarian position it is essential to discriminate between situations with and without bad brute luck. Let the events drawn for P1 and P2 be denoted $e_1, e_2 \in \mathcal{E} = \{A, B, C\}$ and partition $\mathcal{E}$ into events with bad brute luck, $BL^{bad} = \{C\}$, in which agents get paid nothing and events without bad brute luck, $BL^{good} = \{A, B\}$, in which deviations in earnings from the insurance value x^{IN} (which in our setting, with an actuarially fair insurance, is \$12) is always a matter of option luck. A luck-egalitarian spectator only wants to compensate an agent who suffered bad brute luck for the part of the inequality that stems directly from this source. Hence is not the case that she necessarily wants to equalize the full income differences just because an agent suffered bad brute luck. In our experimental setting we get the following fair allocation to P1 under this norm:

$$F_1^{LE} = \begin{cases} x_1 & \text{if} \quad e_1, e_2 \in BL^{bad} \text{ or } e_1, e_2 \in BL^{good}, \\ x_1 - \dfrac{x^{IN}}{2} & \text{if} \quad e_1 \in BL^{good} \text{ and } e_2 \in BL^{bad}. \end{cases} \tag{4}$$

Finally, given the results presented in Section 3 another alternative norm choice compensation (CC), i.e. that the spectator conditions compensation to the person with the lowest earnings on her *choice* regarding exposure to option luck. We denote the insurance choices for P1 and P2 $c_1, c_2 \in \mathcal{C} = \{yes, no\}$ and get, in our experimental setting, the following fair allocation to P1 (remembering that P1 always has a higher earning than P2):

$$F_1^{CC} = \begin{cases} x_1 & \text{If } c_2 = no, \\ \frac{x_1 + x_2}{2} & \text{If } c_2 = yes. \end{cases} \quad (5)$$

Table 4 outlines the behavior that these four fairness norms predict in the 11 situations in which spectators made decisions in our experiment.[12]

Table 4
Predicted Behavior

Situation	Outcome from part 1 (P1 , P2)	Earnings from part 1 (P1 , P2)	Strict Egalitarianism	Libertarianism	Luck Egalitarianism	Choice Compensation
1	A , B	24 , 0	E	NE	NE	NE
2	A , C	24 , 0	E	NE	Indiff	NE
3	A , B^{IN}	24 , 12	E	NE	NE	E
4	B^{IN}, C^{IN}	12 , 0	E	NE	E	E
5	A , C^{IN}	24 , 0	E	NE	Indiff	E
6	B^{IN}, C	12 , 0	E	NE	E	NE
7	B^{IN}, B	12 , 0	E	NE	NE	NE
8	A^{IN}, C	12 , 0	E	NE	E	NE
9	A , A^{IN}	24 , 12	E	NE	NE	E
10	A^{IN}, C^{IN}	12 , 0	E	NE	E	E
11	A^{IN}, B	12 , 0	E	NE	NE	NE

Superscript "IN" indicates that the participant chose to buy the insurance against the loss associated with event B. For expositional ease this table presents the situations such that P1 always has higher earnings than P2 from part 1. In the experiment this ordering was not imposed. The last four columns indicate the predictions by the different fairness norms in our experiment. E=Equalize, NE=Not equalize, Indiff=Indifferent.

Note that spectators conditioning compensation for low earnings on its cause are indifferent between equalizing or not in situations 2 and 5. Equation (4) tells us that in these situations a luck egalitarian spectator would prefer to split the total earnings of 24 in such a way that P1 receives 18 and P2 receives 6. The reason is that she only wants to compensate for the part of the inequality

[12] It is important to note that our fairness types are not necessarily exhaustive. In Online Appendix D we discuss, define and analyze an alternative version of Choice Compensation that is treating upside and downside risk symmetrically. We find no empirical support in our data for this alternative definition.

that stems directly from the bad brute luck of the person with the lower earnings. However, as this option was not allowed in the experiment, these spectators are indifferent because the available options generate the same deviation from the fair distribution.

4.2. Exact Classification of Spectators

Considering all 11 choices, the data show that whereas 13.1 and 19.6 percent of spectators made decisions that are exactly in accordance with strict egalitarianism and libertarianism respectively, only one person (0.7 percent) made luck egalitarian choices. 7.8 percent made choice conditioning decisions.

These data are outlined in Table 5 where we also show that the conclusion of there being comparatively few luck egalitarians is not sensitive to allowing the spectators to occasionally make deviations from the respective fairness ideal.

Table 5
Share of Spectators by Norm, Percent

	No deviations	Max 1 deviation	Max 2 deviations
Strict Egalitarians (SE)	13.2	15.8	18.4
	(2.75)	(2.97)	(3.15)
Libertarians (L)	19.1	23.0	27.0
	(3.20)	(3.43)	(3.61)
Luck Egalitarians (LE)	0.7	0.7	7.2
	(0.66)	(0.66)	(2.11)
Choice Compensators (CC)	7.9	15.1	28.3
	(2.19)	(2.91)	(3.67)
No Classification	59.2	45.4	21.7
	(4.00)	(4.05)	(3.36)

Robust standard errors in parentheses. No deviations indicate the share of spectators whose behavior exactly correspond to the predictions of the respective fairness norm. Max 1 deviation and Max 2 deviations indicates the same share but with one and two deviations from the fairness norm allowed, respectively. Note that when allowing for max 2 deviations, 4 participants could be classified as both luck egalitarians and choice compensators (equal split in situations 4, 5 and 10). Hence the shares in that column adds up to slightly more than 100% (102%). N=152.

4.3. Estimation of Choice Model

In order to conduct a structural estimation of which norms the spectators in our experiment behave in accordance with, we continue to follow Cappelen et al. (2013) and assume a random utility model,

$$U(y;\cdot) = \gamma_i V(y;\cdot) + \epsilon_{iy} \text{ for } y \in \{x, X/2\}, \tag{6}$$

with a utility loss function, V, which is quadratic and equal to

$$V(y;\cdot) = -\frac{(y - F^{k(i)})^2}{X}. \tag{7}$$

Choices are made to maximize utility, and ϵ_{iy} are assumed to be extreme value iid. X is defined as the sum of the two outcomes in a given pair. (As before, the argument denoted by the dot after the semicolon represents individual-level heterogeneity.)

The heterogeneity consists of $(\gamma_i, k(i))$ in which the parameter γ_i determines a spectator's willingness to trade off deviating from her fairness ideal $k(i)$ given random utility shocks, ϵ_{iy}, to the alternatives available in each situation. In the limit case where $\gamma_i = 0$ choice probabilities are always uniform, whereas as $\gamma_i \to \infty$ choices converge to always being in line with the prediction of the fairness ideal. For an individual, this gives rise to logit choice probabilities,

$$P_{ij} = \Lambda(\gamma \cdot \Delta_{ij}V) = \frac{1}{1 + \exp(-\gamma \cdot \Delta_{ij}V)}, \tag{8}$$

in which $\gamma \cdot \Delta_{ij}V$ is the difference in the deterministic utility loss between the actually chosen alternative and that of the non-chosen alternative in situation j, and Λ is the logistic CDF. Integrating out the unobserved heterogeneity, we have the likelihood of observing the choices of an individual as

$$L_i = \sum_k \lambda_k \int_0^\infty \left[\prod_{j=1}^{J} \Lambda(\gamma \cdot \Delta_{ij} V) \right] f(\gamma; \mu, \sigma) d\gamma, \tag{9}$$

in which λ_k is the population share holding ideal k and $f(\gamma; \mu, \sigma)$ is the density of γ. We assume that $\log \gamma \sim N(\mu, \sigma^2)$.

We want to estimate the distribution of γ_i and the population share for each of the fairness views: λ^{SE} (share of strict egalitarians), λ^{L} (libertarians), λ^{LE} (luck egalitarians) and λ^{CC} (choice compensators). The (log) likelihood function is maximized with the BFGS method, after an initial Nelder-Mead search for good starting values. We use the stats4 library of R (R Core Team, 2014).

The results of the estimations are reported in Table 6. Specification (1) confirms the conclusion from Table 5, that only very few of our spectators condition compensation for low earnings on bad brute luck, i.e. behave in accordance with luck egalitarianism. By comparing specification (1) with specification (2) we note that even though luck egalitarianism does contribute marginally to the likelihood, its explanatory power is small.

Table 6
Estimation Results

	(1)	(2)	(3)	(4)	(5)
Share Strict Egalitarian, λ^{SE}	0.338	0.343		0.342	0.461
	(0.049)	(0.049)		(0.053)	(0.057)
Share Libertarian, λ^{L}	0.313	0.314	0.572		0.539
	(0.046)	(0.046)	(0.069)		(0.057)
Share Luck Egalitarian, λ^{LE}	0.010				
	(0.013)				
Share Choice Compensation, λ^{CC}	0.339	0.343	0.428	0.658	
	(0.051)	(0.051)	(0.069)	(0.053)	
μ	-0.873	-0.912	-10.821	-1.571	-1.600
	(0.179)	(0.173)	(17.735)	(0.142)	(0.157)
σ	2.15	2.140	10.974	1.923	6.129
	(0.357)	(0.334)	(17.336)	(0.199)	(50.530)
log L	-817	-818	-938	-965	-904

The distribution of γ_i is parametrized such that $\log \gamma \sim N(\mu, \sigma^2)$. One ideal is estimated residually, and standard errors (in parentheses) are calculated from the estimated parameters using the Delta method. The estimation approach uses BFGS to maximize the likelihood, after an initial search for starting values. Total number of decisions = 1672, total number of spectators = 152.

As is also evident from specifications (1) and (2) that substantial (and about equally large) shares of the spectator can be described as strict egalitarians, libertarians and choice compensators, respectively. In specifications (3)-(5) we remove, in turn, one of these three fairness norms. This leads to substantially lower likelihood values, which tells us that all three norms are important in order to account for the observed choices. This conclusion is corroborated by how the estimated distribution of γ changes between specification (1) and (2) on the one hand, and (3)-(5) on the other hand. Specifications (3) and (5) both extreme values of σ and its standard error, indicating problems with fitting the model when omitting the norms choice compensation or strict egalitarianism as it then needs to predict uniform choice probabilities for a substantial fraction of the participants in order to fit data.

Since our estimation procedure only classify spectators into ideals probabilistically, model fit at the individual level is not uniquely identified. Instead we simulate the model with the preferred specification (Column 2 in Table 6), and calculate the predicted analog of Table 5. In Table 7 we see that the qualitative patterns of Table 5 are preserved in the simulations.

Table 7
Share of Spectators by Norm in Percent, Simple Classification on Predicted Data

	No deviations	Max 1 deviation	Max 2 deviations
Strict Egalitarians (SE)	10.8	15.1	19.1
Libertarians (L)	9.9	13.9	18.1
Luck Egalitarians (LE)	0.1	1.2	6.1
Choice Compensators (CC)	10.8	15.2	19.7
Not Classified	68.4	54.6	37.0

Predicted analog of Table 5. Based on simulations of 100 000 datasets in which $(\gamma_i, k(i))$ are allocated according to the distribution estimated in Column 2, Table 6.

5. Experimental Extension

In the experiment described above, all participants first made the insurance decisions in part 1 and then acted as disinterested spectators in part 2. This makes the insurance choice very salient and may hence generate different results than a design where the roles are separated. In this section we discuss this question. First, we note that participants who chose to insure did make different choices as spectators than those who chose not to insure, with the former being more prone to equalize the payoffs between the two agents in the pair that they were matched to (they decided to equalize choices in 50.6 percent (se=2.92) of the situations on average, compared to 29.5 percent (se=5.37) for those who did not buy the insurance, the difference is highly statistically significant with $p<0.01$).

Table 8 shows the result of an estimation of the choice random utility model, with the sample divided by insurance choice. We see that those who chose not to buy insurance are more likely to follow a libertarian norm than those who bought insurance. None of the groups feature a substantial number of luck egalitarian spectators. On the other hand, choice conditioning spectators can be found among both those who chose to insure and those who did not. The last observation indicates that the choice conditioning norm is not simply reflecting a preference among spectators towards people who made the same insurance decision as the spectator herself.

Table 8
Estimation Results, Split by Spectator's Insurance Decision

	Bought insurance		Did not buy insurance	
	(1)	(2)	(3)	(4)
Share Strict Egalitarian, λ^{SE}	0.392	0.397	0.105	0.119
	(0.056)	(0.056)	(0.071)	(0.078)
Share Libertarian, λ^{L}	0.225	0.225	0.650	0.679
	(0.046)	(0.046)	(0.116)	(0.112)
Share Luck Egalitarian, λ^{LE}	0.009		0.063	
	(0.012)		(0.087)	
Share Choice Compensation, λ^{CC}	0.374	0.378	0.182	0.202
	(0.058)	(0.059)	(0.096)	(0.100)
μ	-0.902	-0.935	-0.682	-0.871
	(0.200)	(0.193)	(0.388)	(0.388)
σ	1.989	1.981	10.252	11.993
	(0.338)	(0.326)	(264)	(393)
log L	-646.8	-647.4	-162.8	-163.1

The distribution of γ_i is parametrized such that $\log \gamma \sim N(\mu, \sigma^2)$. One ideal is estimated residually, and standard errors (in parentheses) are calculated from the estimated parameters using the Delta method. The estimation approach uses BFGS to maximize the likelihood, after an initial search for starting values. Total number of decisions in (1) and (2): 1331 (121 spectators). Total number of decisions in (3) and (4): 341 (31 spectators). Note that the constraint that the σs are the same in (1) and (3), and in (2) and (4) cannot be rejected (likelihood ratio tests based on a pooled and restricted model: $\chi 21=0.56$, p=0.45 and $\chi 21=1.02$, p=0.31, respectively).

The fact that spectators who chose to insure acted differently than those who did not insure does not imply that the spectators in our main experiment would have acted differently if they would not have made the insurance decision themselves. It does, however, raise the question of whether our results would hold in a design where the roles are separated.

To investigate this, we conducted an experimental extension in November 2012. In these sessions participants made decisions *either* in part 1 or part 2, but never in both. Instead of being compensated through the earnings in part 1, the spectators were given a fixed sum of $8 (equal to the expected earnings in part 1) for making the distribution decisions in part 2. It was randomly determined in which part a particular participant would make decisions. We made minimal changes to the instructions to reflect these changes, but in all other respects the design and implementation were identical to the main experiment. All participants (also those who would act as spectators in part 2 and hence would not make the insurance decision) participated in the quiz in part 1 in order to ensure that the spectators had a similar understanding of the situation as they had in the original experiment.

70 people, who had not taken part in the original experiment, made decisions as spectators. Their average age was 22 years and 49 percent were female. Their average earnings were $20 (including a fixed show-up fee).

Just as in the main experiment, we find that the spectators were more prone to equalize earnings between the two participants in the pair that they were matched to when one of the people in the pair had experienced bad brute luck. In these situations payoffs were equalized on average 50.5 percent (se=3.90) of the time. In the situations without bad brute luck the corresponding percentage was 38.3 percent (se=3.54). This difference is statistically significant ($p<0.01$).

In Section 3 we utilized the fact that the six situations involving bad brute luck can be divided into three pairs (2 and 5, 4 and 6, and 8 and 10 respectively) where the insurance choice of person 1 and the outcomes for both P1 and P2 from part 1 are held constant. The only thing that differed between the two situations in each pair is whether person 2 bought insurance or not. In the experimental extension, where the spectators had not made the insurance decision themselves, we found the same pattern as described in Section 3, namely that spectators redistributed more when the person who suffered bad brute luck had also chose to insure against bad option luck.[13]

Lastly, Table 9 shows the result of the estimation of the choice random utility model, both for the experimental extension, and for the pooled data. The estimated shares are not exactly identical which could, for example, be caused by subjects acting only as spectators being less engaged and therefore more prone to non-equalising, libertarian choices. However, given the similarity between the results from the original experiment and the extension, we conclude that our results replicate and that the conclusions drawn from the main experiment holds also when the spectators did not themselves make the insurance decision.

[13] In situation 2, 51.43 percent (se=6.02) chose to equalize which is significantly less ($p<0.01$) than in situation 5 where 72.86 percent (se=5.35) equalized. The difference between situations 4 and 6 (where 61.43 percent, se=5.86 and 24.29 percent, se=5.16 chose to equalize) and between situations 8 and 10 (where 30.0 percent, se=5.52 and 62.86 percent, se=5.82 chose to equalize) are also highly statistically significant ($p<0.01$).

Table 9

Estimation Results, Experimental Extension and Pooled Data

	Extension		Pooled data from both experiments	
	(1)	(2)	(3)	(4)
Share Strict Egalitarian, λ^{SE}	0.234	0.234	0.306	0.309
	(0.060)	(0.060)	(0.039)	(0.039)
Share Libertarian, λ^{L}	0.495	0.495	0.369	0.370
	(0.072)	(0.073)	(0.040)	(0.040)
Share Luck Egalitarian, λ^{LE}	0.000		0.007	
	(0.000)		(0.009)	
Share Choice Compensation, λ^{CC}	0.271	0.271	0.318	0.321
	(0.066)	(0.066)	(0.041)	(0.041)
μ	-0.580	-0.580	-0.720	-0.742
	(0.187)	(0.187)	(0.143)	(0.138)
σ	20.02	7.975	2.325	2.333
	(39591)	(84.9)	(0.432)	(0.429)
log L	-435.4	-435.4	-1255	-1256

The distribution of γ_i is parametrized such that $\log \gamma \sim N(\mu, \sigma^2)$. One ideal is estimated residually, and standard errors (in parentheses) are calculated from the estimated parameters using the Delta method. The estimation approach uses BFGS to maximize the likelihood, after an initial search for starting values. Total number of decisions in (1) and (2): 770 (70 spectators). Total number of decisions in pooled data: 2442 (222 spectators). Note that we cannot reject the restricted models in columns (3) and (4) neither against the unrestricted one in column (1) and (2) of table 9 nor against (1) and (2) of table 6 ($\chi 26$=5.67, p=0.46 for the model with LE included, $\chi 25$=5.44, p=0.36 with the λ^{LE}=0).

6. Conclusions

This paper provides evidence on preferences for equality and fairness views in situations where the outcome is determined by luck. We jointly consider two types of luck: brute luck, which the individual cannot influence, and option luck, the exposure to which is in control of the individual. In the experiment we study which fairness norms people adhere to when they act as spectators and distribute resources between two other agents.

There are three main findings. First, we document that the spectators are, on average, more likely to equalize earnings between agents in situations where bad brute luck played a role in generating the initial inequality. This might lead one to believe that a significant fraction of spectators behave in accordance with luck egalitarianism and condition compensation for a bad outcome on bad brute luck, i.e. on the underlying cause for the low earnings. However, our second finding is that spectators do not treat brute and option luck separately, as they should if they were behaving in accordance with this norm. Our third finding is that instead many spectators are choice compensators in the sense that they condition compensation for bad brute luck on the agent's choice about option luck exposure, even when this choice was irrelevant. We use a choice model to estimate which share of spectators adhere to the different fairness ideals and find that our data are well explained by a model with three types: strict egalitarians, libertarians, and choice compensators. We find very little support for the existence of luck egalitarians.

Our investigation is descriptive rather than normative and the finding that spectators condition on choice rather than on cause is not an evaluation of the moral standing of these norms. It is simply a description of how the participants in our experiment handle the joint presence of uncontrollable and controllable events when making redistributive decisions. Our findings show that it in some cases may not always be enough to consider the cause behind a particular situation in order to understand how fairness is assessed. Other factors preceding the situation, such as a choice, may be more important even when they do not actually influence the outcome.

How can we understand the notion of choice compensation as compared to luck egalitarianism? The two norms are similar in the sense that both have responsibility for own choices at the core. The difference is that whereas the latter apply this responsibility only in circumstances that an agent can control, the former extend it to also encompass situations where the choice neither caused nor affected the outcome.

There are several reasons why this behavior could arise. Choice compensating spectators may, for example, want to reward “good behavior” (if they regarded buying the insurance as the correct thing to do). Another possibility is that these spectators use the insurance choice as a signal about a person’s type (as the insurance decision involves a fair gamble it seems a natural basis for distinguishing for example between risk averse and risk loving people, i.e. between people whose utility functions have different shapes): If spectators care differently about different types, or desire to respect preferences, it would be natural for them to condition their distribution decision on this signal. However, given that our experiment was not set up to distinguish between these (and other) potential underlying motivations for the existence of choice conditioners we leave it for future research to pin down the exact source of the choice compensating behavior.

Despite the logic behind luck egalitarianism and choice compensation being similar, the implications are potentially very different. According to luck egalitarianism, a person with a risky lifestyle is to be held responsible for bad outcomes that are directly linked to her risky actions. For example a smoker is to be held more responsible than a non-smoker for contracting a smoking-related disease, such as lung cancer, but she is *not* to be held more responsible if she suffers from an illness that is unrelated to smoking. Similarly, a person who makes risky investment decisions, is frequently seen at casinos, and speeds with his car should not be compensated for losses related to his risky behavior. However, if he experiences bad luck that is unrelated to these behaviors, for example unemployment, he should not be treated differently than a person who has never set his foot in a casino, has his money in the mattress, and drives 10 mph below the speed limit.

Choice compensators, who follow a norm where compensation for bad outcomes are made conditional on choice, regardless of whether this mattered for the outcome or not, are different. They hold the smoker more responsible than the non-smoker, regardless of whether the disease she contracts is related to smoking or not. Likewise, they regard the notorious risk-taker as less deserving of for example unemployment compensation than his risk minimizing colleague, even if the risk-taking of the former had nothing to do with the risk of unemployment.

Policy formation in the world outside the laboratory is profoundly different from the stylized situations that we explore and that implies that the external validity of our study is limited. In addition, only a fraction (albeit a rather significant one) of our spectators show choice compensating behavior. Nevertheless, we believe that it is important to point out that the differences between choice compensators and luck egalitarians could potentially have policy implications. If society would endorse elements of choice compensation rather than of luck egalitarianism it would imply a step up in the extent to which agents are held responsible for their actions. The difference between these norms could also impact opinions about which treatments a publicly financed health insurance should pay for. This, in turn, could be of importance for example when determining if, and to what extent, it is desirable that publically financed treatments should be made conditional on an individual's general risk taking behavior.

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Online Appendix

A. Experimental instructions

Hi and welcome! You will see instructions on your screen and we will also read the instructions to you, so please follow along. In this study you can earn money. The amount will depend on your decisions, the decisions of other participants and on luck. All cell-phones must be turned off. You are not allowed to talk with any of the other participants during the study. If you have questions or need help, please raise your hand and one of us will help you in private. Also, note that all participants are anonymous and that you will only be identified with the code number that you can find on a small piece of paper on your desk. The study has several parts. We will now go over the instructions for part 1.

Part 1 instructions

All participants have now been given 24 dollars. At the end of part 1, one of three events will occur. The events are called A, B and C and they are all equally likely to happen. The consequences of these events are as follows:

- If event A occurs, you will keep your 24 dollars.
- If event B occurs, you will lose your 24 dollars.
- If event C occurs, you will lose your 24 dollars.

Before the random draw between events A, B and C is made, you have the possibility to buy an insurance against the loss associated with event B. The price of the insurance is 12 dollars, but the cost must only be paid if you get to keep your money. This means that the following will happen if you decide to buy the insurance:

- If event A occurs, you keep your 24 dollars, pay 12 dollars for the insurance and hence keep 12 dollars.

- If event B occurs, you keep your 24 dollars, pay 12 dollars for the insurance and hence keep 12 dollars.

- If event C occurs, you lose your 24 dollars and hence keep nothing.

And the following will happen if you decide to not buy the insurance.

- If event A occurs, you keep your 24 dollars.

- If event B occurs, you lose your 24 dollars and hence keep nothing.

- If event C occurs, you lose your 24 dollars and hence keep nothing.

In sum, the insurance does not affect the expected value of your earnings. If you buy insurance, you have a probability of 2/3 to get 12 dollars and if you don't buy the insurance, you have a probability of 1/3 to get 24 dollars. This means that the expected value is 8 dollars in both cases.

On the next screen we will ask you some questions regarding the choice situation described above. Note that the sheet on your desk sums up all the information needed to answer the questions.

Part 1 control questions

Question 1: How much money is each participant allocated at the start of part 1?

Question 2: How many dollars does it cost to insure against the loss associated with event B?

Question 3: Which of event A, B and C is most likely to happen? *Alternatives: 1) Event A. 2) Event B. 3) Event C. 4) They are all equally likely.*

Question 4: How much will you have after part 1, if event A happens to you? *Alternatives: 1) I will have 24 dollars regardless of if I bought insurance or not. 2) I will have 24 dollars if I did not buy the insurance and 12 dollars if I did buy it. 3) I will have 0 dollars if I did not buy the insurance and 12 dollars if I did buy it.*

Question 5: How much will you have after part 1, if event B happens to you? *Alternatives: 1) I will have 24 dollars regardless of if I bought insurance or not. 2) I will have 24 dollars if I did not buy the insurance and 12 dollars if I did buy it. 3) I will have 0 dollars if I did not buy the insurance and 12 dollars if I did buy it.*

Question 6: How much will you have after part 1, if event C happens to you? *Alternatives: 1) I will have 0 dollars regardless of if I bought insurance or not. 2) I will have 24 dollars if I did not buy the insurance and 12 dollars if I did buy it. 3) I will have 12 dollars regardless of if I bought insurance or not.*

End of part 1

You have now completed part 1 and one of the events A, B and C has been drawn. You will learn which event that was drawn for you at the end of the study. We now move on to part 2.

Part 2 Instructions

This part of the study is about the distribution of the earnings from part 1. Two other participants in this room will be randomly put together to form a pair. Your task is to decide how this pair's total earnings from part 1 will be split between the two of them. You will see several such situations where you have to make this decision. One of the situations that you will see has in fact happened to the pair. With 50 percent probability your decision in that situation will determine these participants' payoff from part 1 (with 50 percent probability it is determined by another participant, but it is never determined by anyone in the pair). In the same way, you have also been placed in a pair with another participant, and someone else in this room will determine how the total earnings in your pair will be split between the two of you. Please note that you will make the distribution decision for two other people, i.e. NOT for yourself and the one you are paired with. In the same way, someone else will make the distribution decision for you and whoever you are paired with.

Part 2 control questions

We will now make sure that everyone has understood the instructions for part 2 correctly. When you have answered the questions below, please click "I understand". If any of your answers are incorrect, the computer will tell you so and you get to answer that question again.

Question 1: In this part you will be matched to two other participants. Who decides how their earnings from part 1 are split between them? *Alternatives: 1) They decide together. 2) One of them decides. 3) I or another participant decides (but none of the people in the pair).*

Question 2: In this part you have also been matched with one other participant to form a pair. Who decides how your earnings from part 1 are split between you? *Alternatives: 1) Another participant (but not the other person in the pair) decides. 2) I decide. 3) The other person in the pair decides.*

End of part 2

You have now completed part 2.

Earnings

You can now see your earnings from the study.

Part 3

While we prepare your earnings, please answer a few questions.

B. Screenshots and Ordering

Figure A1: Making the insurance choice

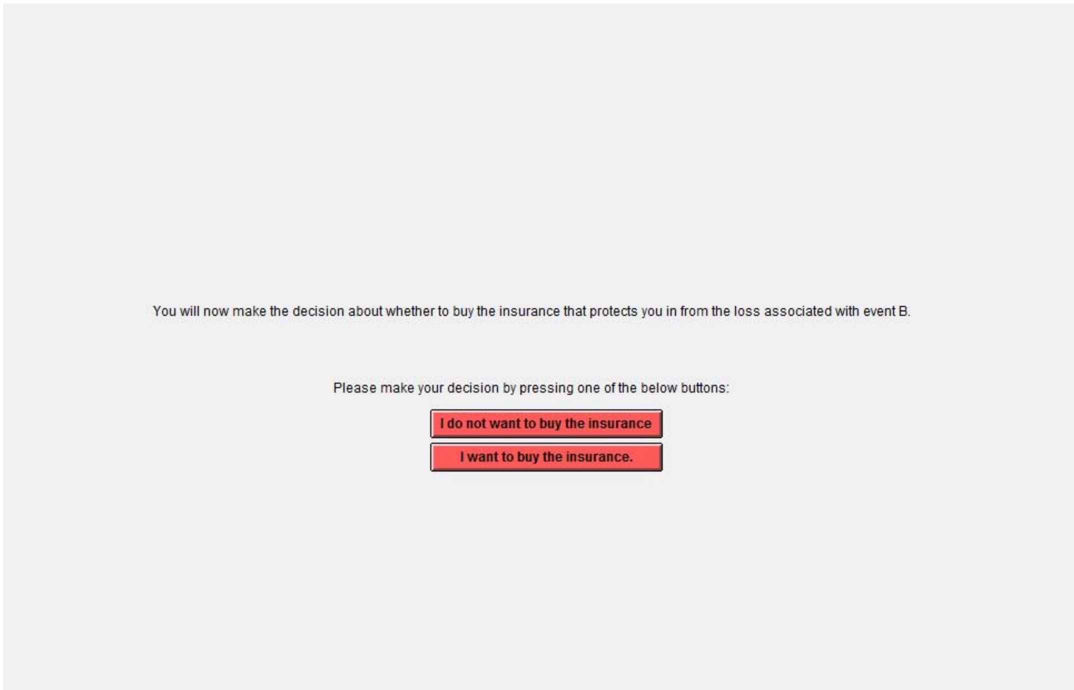

Figure A2: One the the 11 situations

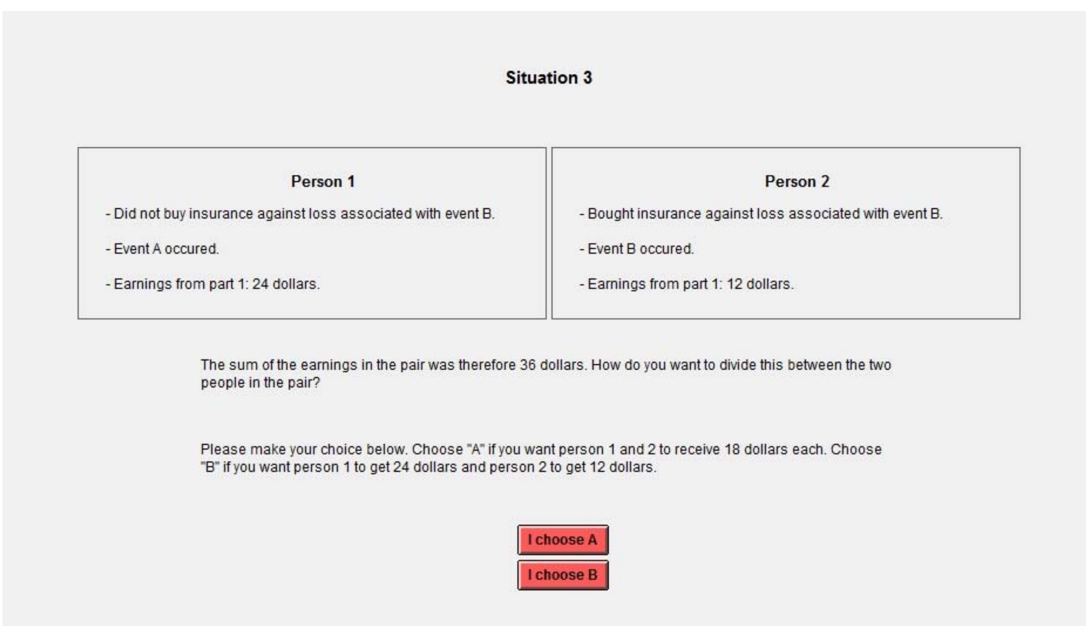

Figure A3: The summary screen (for situations 1-3)

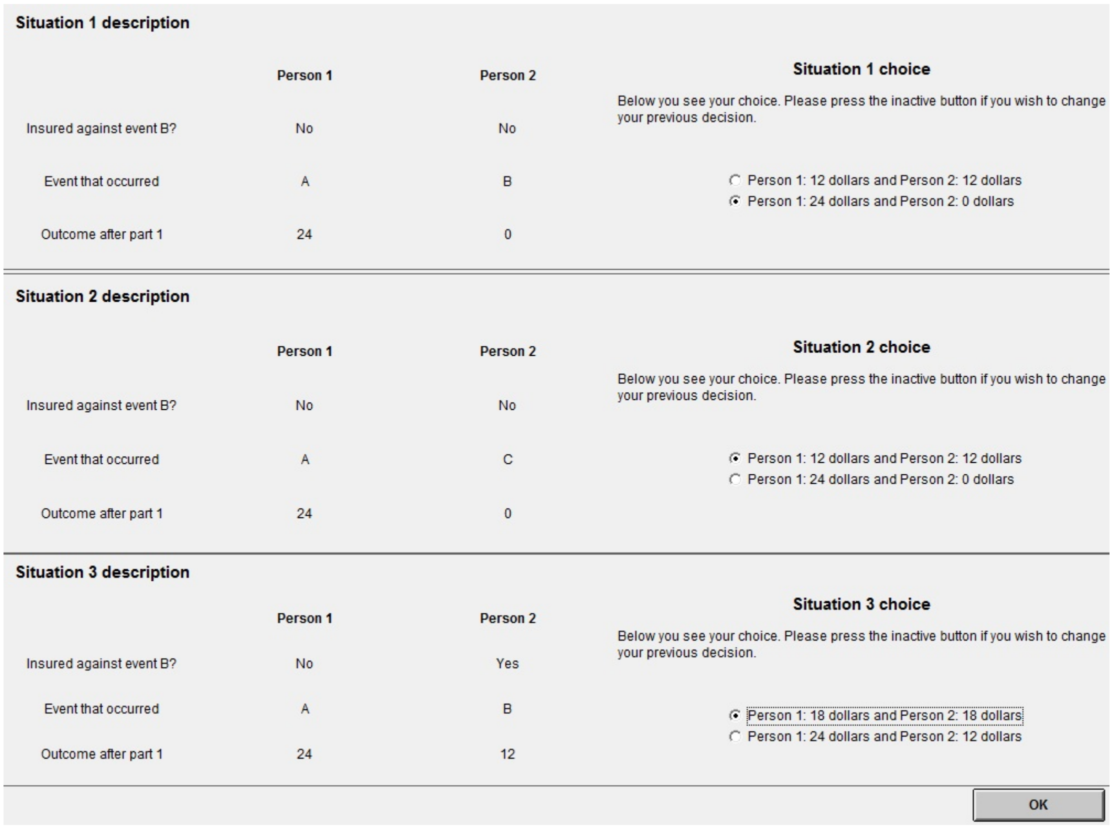

Table A1

The 11 Decisions - Imposed Ordering

Situation	Outcome from part 1 (P1 , P2)
1	A , B
2	A , C
3	A , B^{IN}
4	B^{IN}, C^{IN}
5	A , C^{IN}
6	B^{IN}, C
7	B^{IN}, B
8	C , A^{IN}
9	A , A^{IN}
10	A^{IN}, C^{IN}
11	B , A^{IN}

Superscript "IN" indicates that the participant chose to buy the insurance against the loss associated with event B.

C. Post-experimental questionnaire

The post-experimental questionnaire asked the following questions:

Question 1: Did you choose to insure against the loss associated with event B in part 1? Alternatives: 1) Yes. 2) No.

Question 2: When making the decision about how to split the earnings between the two other participants, how concerned were you about making a fair decision? [Participant indicates on a scale from 1-10 where 1 is ”Not at all concerned” and 10 is ”Very concerned about fairness”]

Question 3: Would you say that you are a person who generally tries to take very little risk or who takes a lot of risk? [Participant indicates on a scale from 1-10 where 1 is ”Take very little risk” and 10 is ”Take a lot of risk”]

Question 4: Gender? Alternatives: 1) Male. 2) Female.

Question 5: Year of birth?

For the interested reader we provide an overview of the results from the questionnaire (from the original experiment) in the tables below.

Table A2
Fairness Concern and Risk Acceptance, by Norm

	Concern with fairness (1-10)	Risk acceptance (1-10)	N
All	7.66	5.45	152
	(0.22)	(0.19)	
Strict Egalitarians (SE)	7.95	5.1	20
	(0.46)	(0.62)	
Libertarians (L)	7.83	6.17	29
	(0.64)	(0.48)	
Luck Egalitarians (LE)	10	6	1
	(N/A)	(N/A)	
Choice Compensators (CC)	8.58	5.17	12
	(0.26)	(0.53)	
Not Classified	7.39	5.33	90
	(0.29)	(0.23)	

The table shows the mean for different groups of answers (1-10) on question 2 and 3 in the post-experimental questionnaire. The classification of the groups is based on exact accordance with norms (0 deviations).

Table A3

Risk Acceptance, by Insurance Choice

	Risk Acceptance (1-10)	N
All	5.45	152
	(0.19)	
No Insurance Bought	7.13	32
	(0.39)	
Insurance Bought	5.01	120
	(0.20)	

The table shows the mean for different groups of answers (1-10) on question 3 in the post-experimental questionnaire. Robust standard errors in parentheses

Table A4

Propensity of Equal Split, by Gender

	All	Women	Men
Share equal splits as spectator	46.17%	49.75%	42.77%
	(2.65)	(3.60)	(3.86)
N	152	74	78

Robust standard error in parentheses.

Table A5
Estimation Results, Split by Gender

	Women	Men
Share Strict Egalitarian, λ^{SE}	0.361	0.314
	(0.073)	(0.066)
Share Libertarian, λ^{L}	0.223	0.377
	(0.060)	(0.066)
Share Luck Egalitarian, λ^{LE}	0.000	0.027
	(0.000)	(0.025)
Share Choice Compensation, λ^{CC}	0.416	0.282
	(0.079)	(0.066)
μ	-1.168	-0.061
	(0.192)	(0.295)
σ	2.275	1.812
	(0.361)	(0.346)
log L	-410.5	-399.8

The distribution of γ_i is parametrized such that $\log \gamma \sim N(\mu, \sigma^2)$. One ideal is estimated residually, and standard errors (in parentheses) are calculated from the estimated parameters using the Delta method. The estimation approach uses BFGS to maximize the likelihood, after an initial search for starting values. Total number of decisions for women: 814 (74 spectators). Total number of decisions for men = 858 (78 spectators).

The difference between the estimated vectors for women and men is significant (p-value of the log likelihood test is 0.019).

D. Additional Robustness Checks

In this part of the Online Appendix, we report on additional robustness checks.

First, we note that according to our definition of Choice Compensators (CC) in the main paper, those who do not buy insurance are fully responsible for downside risk (i.e. they are not compensated in the case of a loss) but not for upside risk (i.e. they are redistributed away from in the case of a gain). It can be argued that this is an asymmetric CC type and that a symmetric version would look different. This has consequences for decisions 3, 5 and 9 where a symmetric choice compensator could be argued to prefer to not equalize (NE) whereas an asymmetric choice compensators prefers to equalize (E). Specifications (1)-(3) in Table A6 tests for the existance of symmetric CC and find no evidence for that.[14]

Second, in specification (4) we exclude the one person who experienced problems with answering the quiz questions, and conclude that excluding this person does not alter the results.

Third, in specification (5) we use only non-revised choices (i.e. the original choices made by spectators, before they had the opportunity to revise the choices if they wanted). Given that the opportunity to revise choices was not widely used, it is not surprising that specifications (5) and (3) are extremely similar.

[14] We thank the editor for pointing us to the potentially important distinction between asymmetric and symmetric Choice Compensation.

Table A6

Robustness Checks

	(1)	(2)	(3)	(4)	(5)
Share Strict Egalitarian, λ^{SE}	0.338	0.450	0.338	0.341	0.316
	(0.049)	(0.057)	(0.049)	(0.049)	(0.048)
Share Libertarian, λ^{L}	0.313	0.530	0.313	0.306	0.323
	(0.046)	(0.057)	(0.046)	(0.046)	(0.047)
Share Luck Egalitarian, λ^{LE}	0.010	0.021	0.010	0.010	0.014
	(0.013)	(0.024)	(0.013)	(0.013)	(0.016)
Share Asymmetric Choice Compensation, $\lambda^{CC(asym)}$	0.339		0.339	0.342	(0.347)
	(0.051)		(0.051)	(0.051)	(0.053)
Share Symmetric Choice Compensation, $\lambda^{CC(sym)}$	0.000	0.000			
	(0.000)	(0.000)			
μ	-0.873	-1.577	-0.873	-0.884	-1.001
	(0.179)	(0.157)	(0.179)	(0.178)	(0.142)
σ	2.150	8.341	2.149	2.130	2.042
	(0.357)	(319.0)	(0.357)	(0.346)	(0.284)
log L	-817	-903	-817	-815	-860

Estimation (1) allows for both asymmetric and symmetric CC whereas (2) only allows for symmetric CC. Specification (3) is identical to specification (1) in Table 6 in the main text and is included for comparison. Specification (4) excludes 1 subject who had trouble answering the quiz questions. Specification (5) uses only non-revised choices. The distribution of γ_i is parametrized such that $\log \gamma \sim N(\mu, \sigma^2)$. One ideal is estimated residually, and standard errors (in parentheses) are calculated from the estimated parameters using the Delta method. The estimation approach uses BFGS to maximize the likelihood, after an initial search for starting values. Total number of decisions = 1672, total number of spectators = 152.