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When the rich do (not) trust the (newly) rich: Experimental evidence on the effects of positive random shocks in the trust game

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Abstract

We study behavior in a trust game where first-movers initially have a higher endowment than second-movers but the occurrence of a positive random shock can eliminate this inequality by increasing the endowment of the second-mover before the decision of the first-mover. We find that second-movers return less (i.e., they are less trustworthy) when they have a lower endowment than first-movers, compared with the case in which first and second-movers have the same endowment. In addition, second-movers who experience the positive shock return more than second-movers who have the same endowment as the first-mover from the outset. First-movers do not seem to anticipate this behavior from second-movers. They send less to second-movers who benefited from a shock. Our findings suggest that in addition to the distribution of the endowments the *source* of this distribution plays an important role in determining the levels of trust and trustworthiness.

KEYWORDS

endowment heterogeneity, luck, random shocks, trust game

JEL CLASSIFICATION

C91, D02, D03, D69

1 | INTRODUCTION

Incomplete contracts are ubiquitous in economic interactions (Anderhub et al., 2002; Chen, 2000; Hackett, 1993). Because it is not always possible to specify contingent responses to unforeseen circumstances, trading relations are often characterized by informal agreements. As a result, trust and trustworthiness are key in promoting cooperation and exchange (Arrow, 1974; Guiso et al., 2004; Smith, 1776). Trust and trustworthiness are also essential factors at the macroeconomic level helping with the development of a society (Algan et al., 2016; Algan & Cahuc, 2010; Batrancea et al., 2019; Bjørnskov, 2012; Knack & Keefer, 1997; Zak & Knack, 2001). Therefore, identifying the determinants of trust and trustworthiness is crucial.

One element likely to affect the levels of trust and trustworthiness is the degree of heterogeneity between group members (Alesina & La Ferrara, 2000, 2002); in particular, whether people differ in wealth.[1] One feature that we believe to be particularly important in this context concerns how the wealth of individuals is established. Milanovic (2015) and Frank (2016) conclude that (good) luck plays an essential role in determining economic success and income. Theories of affect further suggest that changes in wealth that result from positive random shocks (e.g., lottery wins, resource discoveries, or technological breakthroughs) can put people in a good mood and that this can influence their decision-making (George & Dane, 2016; Lerner et al., 2015; Loewenstein, 2000). When positive random shocks occur in strategic settings, they are likely to shape the behavior of those affected by the positive random shock (i.e., the lucky ones) and those interacting with them; for example, by affecting attitudes and beliefs regarding reciprocity and prosocial behavior.[2] This paper uses a laboratory experiment to study the levels of trust and trustworthiness when people differ in their wealth but where the occurrence of a positive random shock can eliminate the existing inequality.

In the context of incomplete labor contracts, there is evidence that wages and effort react to the occurrence of productivity shocks (Eliaz & Spiegler, 2014; Jayachandran, 2006). The rationale is that changes in wages that occur during economic recessions or expansions can trigger negative or positive reciprocity responses from workers, depending on the wage that they use as a reference point (Bejarano, Corgnet, & Gómez-Miñambres, 2021; Buchanan & Houser, 2020; Gerhards & Heinz, 2017). The current paper attempts to examine how the occurrence of a positive random shock that can affect the wealth of individuals can influence the levels of trust and trustworthiness, which are key in promoting exchange in the context of incomplete contracts. This question is also important from a macroeconomic perspective. Consider two companies operating in different countries or markets (one richer than the other). Before any exchange takes place, there is a positive random shock that affects the relatively poor company; for example, there is a technological shock in its market, an increase in the demand or a new discovery. You may think of a company selling face masks during the COVID-19 pandemic, a company that experiences an increase in demand because their product goes viral after unexpected social media success, or a company that increases sales in a foreign country after favorable regulatory changes. In these cases, the positive shocks are such that the relatively poor company becomes as wealthy as the other company. If companies interact in a context of incomplete contracts, how would this random event affect the strategic interaction?

[1]There is evidence that wealth inequalities have noteworthy consequences in a variety of settings, including antisocial behavior (Fehr, 2018; Gangadharan et al., 2019), happiness (Alesina et al., 2004; Oishi et al., 2011), or cooperation (Camera et al., 2020; Hargreaves-Heap et al., 2016; Tavoni et al., 2011; Zelmer, 2003).

[2]It is also possible that the occurrence of positive random shocks favors the propensity to comply with social norms, as negative random shocks lead to more violations of social norms and an increase in antisocial behavior (Bogliacino et al., 2024).

We follow the procedures in Bejarano et al. (2018) and Bejarano, Gillet, and Rodriguez-Lara (2021) by using a variation of the trust game in Berg et al. (1995) and consider the possibility that relatively richer first-movers—who start out with a higher endowment than the second-movers—behave differently depending on the level or the source of the inequality.[3] In our setting, the occurrence of a positive random shock depends on the outcome of a die roll that can eliminate the wealth inequality for specific pairs of first- and second-movers by increasing the endowment of the second-mover before the decision of the first-mover.[4] Our experimental design incorporates two additional treatments—one where first-movers have a higher endowment than the second-movers, the other where first- and second-movers have the same endowment—but where these distributions exist from the outset and positive random shocks are not possible. This allows us to decouple the effect of the distribution of wealth and the source of the distribution on the levels of trust and trustworthiness.

We rely on outcome-based models to derive our behavioral predictions (Kerschbamer, 2015).[5] Models of inequality aversion, for instance, predict that second-movers will return less when they are relatively poorer than first-movers but traditional theory (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999) remains silent on the potential influence of the source of the inequality. If we consider that initial endowments serve as a reference point (e.g., Baillon et al., 2020; Masatlioglu & Ok, 2005) we predict that second-movers will return more when they experience a positive random shock, compared with a setting in which second-movers start out with the same endowment as first-movers. A similar logic applies for first-movers. As an example, an inequality-averse first-mover who expects to receive nothing from second-movers will send more to a relatively poorer second-mover than to a richer second-mover. However, models of inequality aversion do not predict any difference in the behavior of first-movers towards "originally rich" second-movers (who were given the same endowment as the first-mover from the outset) and "newly rich" second-movers (who started out poor but experienced a positive random shock). This does not necessarily occur if we incorporate the idea of reference points into the model.[6]

Our results provide evidence that people care about the *source* of inequality in the trust game. In particular, second-movers who experience a positive shock return more than second-movers that were initially given the same endowment as first-movers. Newly rich or lucky second-movers are therefore more trustworthy than those second-movers who are originally rich.[7] As for the behavior of first-movers we find that they send less to second-movers who experience a positive random shock, compared to what they send to second-movers that have

[3]In the trust game, first-movers decide the amount they want to send (if any) to second-movers. Any amount sent is multiplied by the experimenter by a given factor before the second-mover decides the amount to return (if any). Under the assumption of selfish preferences, the sub-game perfect equilibrium is that second-movers will return nothing to the first-movers, and consequently first-movers will not send any positive amount to second-movers. The behavior of first-mover has been usually identified in the literature as the level of trust, whereas how much the second mover returns is usually interpreted as the level of trustworthiness.

[4]Bejarano et al. (2018, 2021b) examine the effect of negative random shocks in the trust game, thus players can experience a decrease in their endowment depending on the outcome of the die roll. We depart from their design in that we focus on positive random shocks.

[5]Note that intentions are also important to determine behavior; see, among others, Cox et al. (2007, 2016); Dufwenberg and Kirchsteiger (2004), Falk et al. (2008), Houser et al. (2008); McCabe et al. (2003).

[6]In fact, first-movers can send more or less to (lucky) second-movers, depending on their beliefs regarding the reciprocal behavior of second-movers. We discuss in detail our theoretical predictions in Section 2.

[7]Throughout this paper, we refer to "newly rich" (or lucky) and "originally rich" second-movers to highlight the effect of the shock on the initial endowment, but these terms could alternatively be framed as "randomly rich" and "deterministically rich".

the same endowment as them from the outset. It appears that rich first-movers trust "newly" rich second-movers less than they do those that are "originally" rich.

Our experiment is novel in investigating how positive random shocks affect behavior in the trust game. Extensive research has explored the determinants of trust and trustworthiness in laboratory experiments (Alós-Ferrer & Farolfi, 2019; Chaudhuri & Gangadharan, 2007; Cooper & Kagel, 2013; Eckel & Wilson, 2011; Johnson & Mislin, 2011). Most of the studies that examine the effect of wealth inequalities tend to vary the initial endowments of the first and/or the second-movers (Anderson et al., 2006; Brülhart & Usunier, 2012; Calabuig et al., 2016; Ciriolo, 2007; Hargreaves-Heap et al., 2013; Lei & Vesely, 2010; Rodriguez-Lara, 2018; Smith, 2011; Xiao & Bicchieri, 2010). Our findings align with this literature in that we show that inequality is important in explaining the behavior in the trust game. However, we advance our understanding of the factors that influence trust and trustworthiness by showing that it is also important to account for the *source* of inequality that is, how the distribution of wealth is determined.

The papers most closely related to ours are laboratory experiments that study how *negative* random shocks influence the level of trust and trustworthiness. The work of Bejarano et al. (2018) and Bejarana, Gillet, and Rodriguez-Lara (1-21.2021) assumes that the first- and second-mover start out with the same endowment, but the occurrence of negative random shock can decrease the endowment of one of the players. Bejarano et al. (2018) argue (and find support for the hypothesis) that random negative shocks that affect the endowment of second-movers can lead to differences in the behavior of first-movers by making the inequality more salient. Their data suggest that richer first-movers send less to relatively poor second-movers when their wealth level is the result of a negative random shock, compared with the case in which second-movers are relatively poor from the outset. Bejarano, Gillet, and Rodriguez-Lara (2021) examine the behavior of first-movers when a negative random shock can occur to them. They find that the *possibility* of the shock is also important to explain the behavior of first-movers, but the actual *occurrence* of the shock is not. Aycinena and Blanco (2023) find evidence that is consistent with the idea that being exposed to the shock reduces trust, but they examine this question in a setting where the realization of the shock is private information. In fact, the negative random shock in the design of Aycinena and Blanco (2023) can affect to both first- and/or second-movers. The current paper departs from these studies in that we focus on the occurrence of *positive* random shocks that eliminate wealth inequalities. We argue that focusing only on negative random shocks would lead to a significant and problematic asymmetry in the literature, as it is also crucial to understand the impact of positive random shocks on economic behavior.

The fact that positive random shocks influence the behavior of second-movers relate our paper to theories of affect (George & Dane, 2016; Lerner et al., 2015; Loewenstein, 2000) that predict a positive response from those who experience these shocks (Kidd et al., 2013; Matarazzo et al., 2020) as well as to a strand of the literature that investigates how changes in economic conditions (e.g., economic expansions) can influence the behavior of people in the labor setting (Bejarano, Corgnet, & Gómez-Miñambres, 2021). Our research is also related to studies that look at the effect of random shocks in the field. In this respect, most of the research focuses on how trust and trustworthiness respond to negative shocks such as natural disasters (see, among others, Calo-Blanco et al., 2017; Cassar et al., 2017; Fleming et al., 2014; Kanagaretnam et al., 2009). In contrast, very limited attention has been given to the impact of positive random shocks, despite these shocks occur in the presence of technological breakthroughs, resource discoveries, or favorable regulatory changes. To the best of our knowledge, Bogliacino et al. (2022) is the only exception, investigating the impact of a governmental land restitution program (a positive shock) in Colombia among victims of forced displacement. They conducted a lab-in-the-field experiment and found that land restitution does not affect trust, but it is significantly correlated with higher trustworthiness. Our study contributes to this literature by providing novel insights into how positive shocks influence trust and trustworthiness in a laboratory experiment.

The remainder of the paper is organized as follows. We present our experimental design and derive our main hypotheses in Section 2. The results are presented in Section 3. Section 4 concludes. The original instructions of the experiment and additional data analyses are relegated to the Appendix. This also includes a more formal model of inequality-aversion that incorporates reference points (Dato et al., 2017; Fahle & Sautua, 2021; Kőszegi & Rabin, 2006, 2007). There is also a comparison with the results in Bejarano et al. (2018) where second-movers also experience a change in their endowment but this is a consequence of a negative random shock.

2 | EXPERIMENTAL DESIGN AND HYPOTHESES

2.1 | Experimental design and procedures

A total of 408 students with no previous experience in similar experiments were recruited to participate in 18 experimental sessions conducted at the ESI Chapman University between May 2014 and May 2018.[8]

At the beginning of each session, participants were welcomed and located in two different rooms (A and B). Once all of the students were seated, they were asked to read the instructions at their own pace (see Appendix A for the original instructions). The experimental material on the table of each participant contained an envelope with their initial endowment. Using the usual procedures for non-computerized trust game experiments, first-movers (in room A) were asked to decide the amount of money they wanted to send (if anything) to their matched second-mover (in room B). The amount sent by each first-mover was placed in the envelope with the ID of their matched second-mover, and then tripled by the instructor in a separate room before being given to second-movers. Upon receiving these envelopes, second-movers were asked to decide how much they wanted to return (if anything) to their matched first-mover.

The initial endowment of first-movers in all treatments was 21 E$.[9] Second-movers also received an initial endowment of 21 E$ in our *Deterministic-Equal* treatment. In *Deterministic-Unequal*, second-movers received 7 E$. In the *Shock* treatments, all second-movers started with an endowment of 7 E$, but we rolled a die in front of the individual first-mover they were paired with before they made their decision. If the outcome of the die was odd the second-mover's endowment was increased to 21 E$ (*Positive Shock-Equal*). Otherwise, second-movers kept their initial endowment of 7 E$ (*No Positive Shock-Unequal*). To inform second-movers on the outcome of the die, we asked first-movers to record this in an "Outcome card" that second-movers received from first-movers. When we distributed the envelopes to second-movers we asked them to show the outcome card to the instructor. We increased the initial endowment of the second-mover if the outcome of the die was odd before making any decision about the

[8]We wanted to have unexperienced subjects, what delayed the data collection.

[9]We use experimental Dollars (E$) in our experiment. These were converted to actual dollars at the end of each session (1 E$ = $0.50).

TABLE 1 Summary of treatment conditions.

		Initial endowments		
Treatment	***N***	**First-mover**	**Second-mover**	
Deterministic-Equal	53	21 E$	21 E$	
Deterministic-Unequal	52	21 E$	7 E$	
Positive Shock-Equal	45	21 E$	7 E$ → 21 E$	The outcome of the die was odd, and 14 E$ were added to the initial endowment of the second-mover.
No Positive Shock-Unequal	54	21 E$	7 E$ → 27 E$	The outcome of the die was even and the second-mover kept her initial endowment.

Note: *N* refers to the number of pairs in each treatment.

amount to return. In our experiment, the realization of the shock takes place before players make their choices.

Table 1 summarizes our treatments. This includes information on the number of pairs in each treatment.

Deterministic sessions lasted about 45 min, while Shock sessions lasted about an hour. The average earnings across all sessions were $20.80, including a $7 show-up fee.

2.2 | Power analysis

We use G*Power 3 (Faul et al., 2007) to determine the sample size. Our primary interest is to test how rich first-movers behave towards equally rich second-movers, depending on whether or not a positive random shock has increased the endowment of second-movers. Our null hypothesis is, therefore, that there is no difference in the behavior of first-movers in the Deterministic-Equal and the Positive Shock-Equal treatments. To obtain power of 0.80 with $\alpha = 0.05$ to detect a medium effect of $d = 0.5$, the projected sample size assuming a Laplace distribution is at least 86 pairs (i.e., 43 pairs in each treatment). As can be seen in Table 1, our study was carried out on 98 pairs for these treatments.

2.3 | Hypotheses

Using backward induction, it is straightforward to show that the Nash equilibrium, if participants only cared about their own payoffs, is that first-movers will send nothing to second-movers. This is because second-movers have no incentive to return any positive amount. The fact that we do observe trust and trustworthiness highlights the role of pro-social behavior or other-regarding preferences in trust game experiments (Alós-Ferrer & Farolfi, 2019; Chaudhuri & Gangadharan, 2007; Cooper & Kagel, 2013; Eckel & Wilson, 2011; Johnson & Mislin, 2011).

One central idea in the literature on pro-social behavior concerns the possibility that subjects are inequality-averse (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999). If we account for the possibility that second-movers dislike payoff differences, we expect second-movers to return less when there is an inequality in favor of the first-mover (Hargreaves-Heap et al., 2013; Xiao & Bicchieri, 2010).[10]

Prediction 1a. Second-movers will return less in the Deterministic-Unequal than in the Deterministic-Equal treatment. Additionally, second-movers will return less in the No Positive Shock-Unequal than in the Positive Shock-Equal treatment.

An obvious shortcoming of inequality-aversion is that it assumes that players care about the distribution of the endowments, not about the way this distribution is generated. As a result, inequality aversion predicts there will be no differences in the behavior of second-movers in the Deterministic-Equal and the Positive Shock-Equal treatments. In contrast, we hypothesize that not only the distribution of endowments is important in determining the level of trust and trustworthiness, but that reference points also shape behavior, for example, when a positive random shock is realized second-movers are more reciprocal. This prediction is in line with the observed behavior in the field. Bogliacino et al. (2022) find that beneficiaries of a land restitution program in Colombia exhibit higher levels of trustworthiness compared to non-beneficiaries. In addition, experimental evidence suggests that positive random shocks that affect the wealth of individuals (Matarazzo et al., 2020) and positive surprises from winning (Kidd et al., 2013) influence generosity. These effects can be related to theories of affect suggesting that psychological factors and emotions influence decision-making (George & Dane, 2016; Lerner et al., 2015; Loewenstein, 2005). For instance, Capra (2004) find that people are more generous in a dictator game when they have been put into a good mood (see also Kirchsteiger et al. (2006) and Drouvelis and Grosskopf (2016) for related evidence). In our experiment, there are several factors that can explain why second-movers will return more after the positive random shock. For example, second-movers can feel more fortunate compared with other second-movers in the same room, or they may attribute their good luck to first-movers who witnessed the die roll and completed the "Outcome card", thus second-movers can be more reciprocal to them. Finally, it is also possible that second-movers perceive that reciprocity is a social norm and that the occurrence of the positive random shock will increase the propensity to comply just as the occurrence of negative random shocks lead to more violations of social norms in Bogliacino et al. (2024).

Prediction 1b. If second-movers care about the source of the inequality and use their initial endowment as a reference point, they will return more in the Positive Shock-Equal than in the Deterministic-Equal treatment. They will send similar amounts in the No Positive Shock-Unequal and Deterministic-Unequal treatments.

One aspect worth noting is that we expect to observe no effect on the behavior of second-movers when a positive random shock is not realized. This is because we assume that second-

[10]A more formal model of inequality aversion is presented in Appendix C. We do not intend to test this model or claim that players are inequality-averse, but we derive some predictions to see how inequality-aversion could rationalize the behavior of second-movers. There are other models that would predict the opposite behavior from second-movers; for example, there is evidence that increasing the stake size decreases trust and generosity (Johansson-Stenman et al., 2005; Larney et al., 2019).

movers use their initial endowment (or the status-quo) as a reference point (Baillon et al., 2020; Masatlioglu & Ok, 2005); that is, they do not feel dissatisfaction if the positive random shock is not realized. An alternative approach would be to consider that being exposed to the shock influences behavior; that is, second-movers use the *expected value* of their endowment as a reference point. In section 3.2 we discuss how the different reference points (initial or expected endowment) lead to different predictions regarding the behavior of second-movers. We also show that our findings (and the ones in Bejarano et al., 2018) align with our assumption that initial endowments are used as a reference point in the trust game.

Next, we look at the behavior of first-movers. To derive testable predictions, we consider two different possibilities. First, we follow the definition of altruism in Brülhart and Usunier (2012) who assume that altruistic first-movers do not expect to receive any return from second-movers. This implies that altruistic first-movers will send more in Unequal treatments than in the Equal treatments, if they care about avoiding the inequality.

> **Prediction 2a.** If first-movers are altruistic (i.e., they do not expect to receive any return from second-movers) and they care about avoiding the inequality, first-movers will send more in the Deterministic-Unequal than in the Deterministic-Equal treatment. Additionally, first-movers will send more in the No Positive Shock-Unequal than in the Positive Shock-Equal treatment.

Because second-movers may vary their behavior when a positive random shock is realized (Prediction 1b), we assume that altruistic first-movers may respond differently depending on whether or not they account for this difference. If altruistic first-movers anticipate the gain in utility for second-movers, they should send less to second-movers who received a positive shock than to second-movers who were initially given the same endowment as first-movers (see Appendix C for a formal model).[11]

> **Prediction 2b.** If first-movers are altruistic (i.e., they do not expect to receive any return from second-movers) and they anticipate that second-movers will obtain extra utility when the random shock is realized, then first-movers will send less in the Positive Shock-Equal than in the Deterministic-Equal treatment.

The second possibility we consider is that first-movers are not altruistic but self-interested meaning that first-movers may care about the inequality but they will try to maximize their own payoff (Rodriguez-Lara & Moreno-Garrido, 2012).[12] In this case, first-movers need to account for the optimal behavior of second-movers (Predictions 1a and 1b) so that first-movers will send more when they expect to receive more from second-movers.

> **Prediction 3a.** If first-movers are self-interested and expect for second-movers to be inequality averse, they will send more in the Deterministic-Equal than in the Deterministic-Unequal treatment. Additionally, first-movers will send more in the Positive Shock-Equal than in the No Positive Shock-Unequal treatment.

[11]As noted by one of the referees, one possibility is that first-movers have a psychological justification (wiggle room) to send less after observing the "right" outcome of the die (e.g., they can attribute the good outcome to their good luck).

[12]As defined in Rodriguez-Lara and Moreno-Garrido (2012) a self-interested individual would be constrained by fairness ideals, thus they will try to maximize their own payoff while *appearing* as fair. This definition for self-interest therefore differs from the idea of selfishness, which assumes that individuals only care about their payoffs.

Prediction 3b. If first-movers are self-interested and anticipate that second-movers will be more likely to reciprocate when the random shock is realized, they will send more in the Positive Shock-Equal than the Deterministic-Equal treatment.

Overall, our predictions can rationalize differences in the behavior of first and second-movers between the Equal and Unequal treatments (Predictions 1a, 2a, 3a), as well as differences between the Deterministic-Equal and the Positive Shock-Equal treatments, if reference points play a role in the decision of players (Predictions 1b, 2b, 3b). The comparison between predictions 2a and 3a and between 2b and 3b will shed light on whether the behavior of first-movers is more likely to be altruistic (i.e., they send to reduce inequalities and expect to receive nothing in return) or strategic (i.e., they send more when second-movers are expected to return more).[13]

3 | RESULTS

3.1 | Non-parametric analysis

Figure 1 displays the amount sent by first-movers (left-hand-side) and the return ratio; that is, the share of the available funds returned by second-movers (right-hand-side panel). Figure 1 includes the average amounts sent and the average proportion returned in each treatment (more descriptive statistics and the distributions are presented in Appendix B).[14]

We perform non-parametric analyses to compare the behavior of first- and second-movers across treatments using the Mann–Whitney test. Table 2 summarizes the results.[15]

Our findings for second-movers are consistent with the hypothesis of inequality aversion leading to Prediction 1a. Second-movers return a lower proportion of the generated funds in the Unequal treatments (where they have a smaller endowment than first-movers), compared with the Equal treatments (where they have the same endowment as first-movers).[16] This occurs both in the Deterministic treatments where the inequality is initially given (Deterministic-Equal vs. Deterministic-Unequal: 0.32 vs. 0.23, $p < .028$) as well as in the Shock treatments where the

[13]Note that our predictions imply that first-movers can anticipate the effect of the random positive shock on the behavior of second-movers. As a result, first-movers who are altruistic and inequality-averse will send less to second-movers who are lucky and experience the positive random shock, while self-interested first-movers will send more to lucky second-movers (e.g., because they expect a higher return from them). However, it is also possible that first-movers are not able to anticipate the behavior of second-movers after the realization of the random shock.

[14]This includes the correlation coefficient between the proportion of the funds returned by second-movers and the amount they received from first-movers in each of the treatments. This has been used as a measure of reciprocity in other studies (e.g., Berg et al., 1995; Calabuig et al., 2016; Chaudhuri & Gangadharan, 2007). Our results suggest that in the correlation coefficients are insignificant in the equal treatments ($p > .114$), but these are positive and significant in the unequal treatments ($p < .001$).

[15]The robust rank-order test (Feltovich, 2003; Fligner & Pollicello, 1981) yields the same results. In addition, most of the results are robust if we adjust for multiple comparisons using the Holm-Bonferroni method. The interested reader can consult Appendix B for these analyses.

[16]One idea for reciprocity is that first-movers retrieve what they have invested, which occurs if second-movers return at least one third of the available funds (Chaudhuri & Gangadharan, 2007; Ciriolo, 200; Coleman, 1990; Rodriguez-Lara, 2018). The results of the Wilcoxon signed-rank test suggest that second-movers return significantly less than one third in the Unequal treatments ($p = .002$).

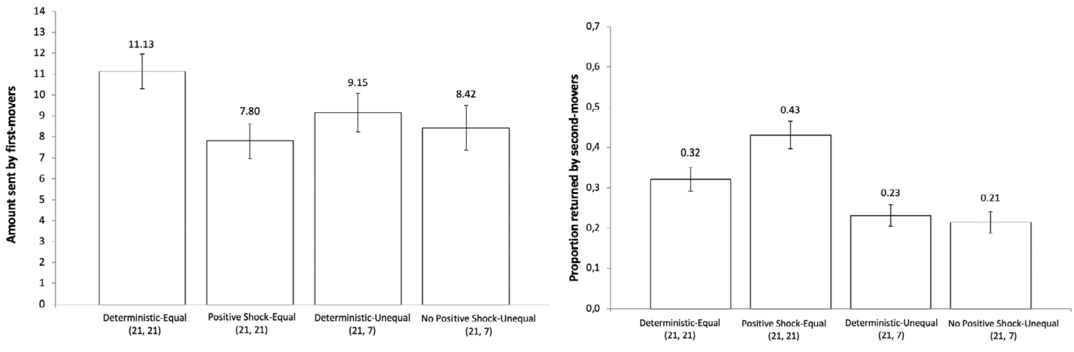

FIGURE 1 Amount sent by first movers (left panel) and proportion returned by second-movers (right panel) in each of the treatments. Error bars reflect standard errors of the mean.

TABLE 2 Mann–Whitney test for the amount sent by first-movers and the share returned by second-movers.

	Behavior of first-movers		Behavior of second-movers	
	Average	*p* value	Average	*p* value
Deterministic-Equal versus Deterministic-Unequal	11.13 versus 9.15	.049	0.32 versus 0.23	.028
Positive Shock-Equal versus No Positive Shock-Unequal	7.80 versus 8.42	.889	0.43 versus 0.21	.000
Deterministic-Equal versus Positive Shock-Equal	11.13 versus 7.80	.002	0.43 versus 0.32	.047
Deterministic-Unequal versus No Positive Shock-Unequal	9.15 versus 8.42	.288	0.23 versus 0.21	.513

Note: The *p* values appear in brackets.

endowment of the second-mover is increased (Positive Shock-Equal vs. No Positive Shock-Unequal, 0.43 vs. 0.21, $p < .001$).

> **Result 1.** Second-movers return less if there is inequality in favor of the first-mover. Second-movers return less in the Deterministic-Unequal than in the Deterministic-Equal treatment. Second-movers also return less in the No Positive Shock-Unequal than in the Positive Shock-Equal treatment.

With regards to our main research question, the results for second-movers suggest that the occurrence of the random positive shock influences reciprocal behavior, as second-movers return significantly more when their endowment is increased in the Positive Shock-Equal treatment, compared with the Deterministic-Equal treatment (0.43 vs. 0.32) ($p < .047$). Thus, we find support for our Prediction 1b that the occurrence of the positive random shock will increase the level of trustworthiness.

> **Result 2.** The positive random shock that increases their endowment—and eliminates the existing inequality—causes second-movers to return more in the Positive Shock-Equal than in the Deterministic-Equal treatment.

When we compare the behavior of first-movers in the Deterministic-Equal and the Deterministic-Unequal treatments, we find that they send significantly more in the former treatment (11.13 vs. 9.15) ($p < .049$). There is no significant difference in the behavior of first-movers in the Positive Shock-Equal and the No Positive Shock-Unequal treatments (7.80 vs. 8.42) ($p = .889$). These findings are more in line with Prediction 3a than Prediction 2a suggesting that self-interest plays a role in the behavior of first-movers.

Result 3. First-movers send less in the Deterministic-Unequal than in the Deterministic-Equal treatment.

With regards to our main research question, we find that first-movers send significantly more in the Deterministic-Equal than in the Positive Shock-Equal treatment (11.13 vs. 7.80) ($p < .002$), suggesting that the *source* of the endowment of second-movers matters for the behavior of first-movers.

Result 4. First-movers send less in the Positive Shock-Equal than in the Deterministic-Equal treatment.

Result 4 seems more in line with Prediction 2b than Prediction 3b, suggesting that in this context first-movers' behavior is mostly driven by considerations involving inequality aversion. This finding is at odds with Result 3 where we observed that self-interest plays a more prominent role than inequality aversion in the behavior of first-movers.

3.2 | On the use of the initial endowment as a reference point

Our behavioral hypotheses build on the idea that (inequality averse) second-movers can use their initial endowment as a reference point (Fahle & Sautua, 2021). Our assumption follows from the status-quo theory, but it is in sharp contrast with the possibility that second-movers use the *expected value* of their endowment as a reference point (Dato et al., 2017; Kőszegi & Rabin, 2006, 2007, 2009). While we are not particularly interested in discussing the exact reference point, we note that both reference points (i.e., initial or expected endowment) lead to different predictions regarding the behavior of second-movers (see Appendix C for a formal model).[17] In this section, we provide some experimental evidence that aligns with our assumption that second-movers use their initial endowment as a reference point.

First, recall that a direct consequence of assuming that second-movers use their initial endowment as a reference point is that second-movers do not experience any loss in utility if a positive random shock is not realized. This leads to our prediction 1b that second-movers will return more in the Positive Shock-Equal than the Deterministic-Equal treatment, but their behavior will be indistinguishable in the No Positive Shock-Unequal and the Deterministic-Unequal treatment. Suppose instead that we allowed second-movers to use the *expected value* of their endowment as a reference point. Then, any shock that is not realized in the No Positive Shock-Unequal would be perceived as a loss for them, because their final endowment (7 E$) will be below their reference point (14 E$). Similarly, any shock that is realized in the Positive

[17]The interested readers on the formation of reference points can consult, among others, Baillon et al. (2020), Bejarano et al. (2021a) or Buchanan (2020), Terzi et al. (2016).

TABLE 3 Summary statistics for the return of second-movers when positive and negative random shocks are possible.

Treatment	*N*	Initial endowments	Final endowments	Mean	Std. dev.	Percentage of return nothing
Deterministic-Equal	53	(21, 21)	(21, 21)	0.32	(0.21)	0.11
Deterministic-Unequal	52	(21, 7)	(21, 7)	0.23	(0.19)	0.22
Positive Shock-Equal	45	(21, 7)	(21, 21)	0.43	(0.25)	0.06
No Positive Shock-Unequal	54	(21, 7)	(21, 7)	0.21	(0.21)	0.20
No negative Shock-Equal	44	(21, 21)	(21, 21)	0.35	(0.25)	0.13
Negative Shock-Unequal	43	(21, 21)	(21, 7)	0.18	(0.19)	0.33

Note: *N* refers to the number of second-movers in each treatment that received a positive amount from first-movers and then could decide how much to return.

Shock-Equal treatment would be treated as a gain because their final endowment (21 E$) will be above their reference point (14 E$). This, in turn, would imply that second-movers who employ the expected endowment as a reference point would be expected to return less in the No Positive Shock-Unequal compared with the Deterministic-Unequal.

Our data in Figure 1 and Table 2 show that second-movers return more in the Positive Shock-Equal than in the Deterministic-Equal treatment (0.43 vs. 0.32, $p < .047$), but their behavior Deterministic-Unequal is not statistically different from their behavior in the No Positive Shock-Unequal (0.23 vs. 0.21, $p = .51$). These findings lend support for our assumption that the initial endowment of second-movers (and not their expected endowment) may serve as a reference point to them.

One interesting question would be to determine whether second-movers also use their initial endowment as a reference point when negative random shocks are possible. To examine this possibility, we look at data reported in Bejarano et al. (2018) and additional data that we collected after that paper was published.[18] In Bejarano et al. (2018), second-movers start out with the same endowment as first-movers (21 E$) but a negative random shock (i.e., the outcome of a die roll) can decrease their initial endowment. In particular, second-movers keep her initial endowment of 21 E$ if the outcome of the die is even (No Negative Shock-Equal) but their endowment is reduced to 7 E$ if the outcome of the die is odd (Negative Shock-Unequal). We report in Table 3 the observed return of second-movers in each treatment condition (see Appendix D for the non-parametric analysis and additional results for the first-movers).

In line with our previous discussion, we find that second-movers return less when they experience a negative random shock that decreases their endowment; in fact, the frequency of second-movers who return nothing is the highest in the Negative Shock-Unequal treatment. This observed behavior would be in line both with the possibility that second-movers use their initial endowment or the expected value of their endowment as a reference point. In order to see which assumption best fits the data we need to look at the behavior of second-movers who do not experience the negative random shock. In this case, the use of the initial endowment as

[18]Their data was collected in 2017, before we carried out the Positive Shock treatments, thus we decided to conduct one more session for the Deterministic-Equal ($N = 6$ pairs), the Deterministic-Unequal ($N = 5$ pairs), and the Negative Shock treatments ($N = 8$ pairs).

a reference point would predict no difference in the behavior of second-movers who do not experience the negative shock in the No Negative Shock-Equal treatment, compared with their behavior when they receive the same endowment as the first-mover in the Deterministic-Equal treatment. This is because the endowment of second-movers is unaffected if the shock is not realized, and second-movers are expected to use their initial endowment as a reference point. Arguably the use of the expected endowment as a reference point would imply that second-movers will return more when a negative random shock is possible but not realized because their final endowment (21 E$) will be above their expected endowment (14 E$). In fact, theories of affect may predict that second-movers who do not experience the negative shock may feel that they have been lucky, thus they may be more willing to reciprocate in the No Negative Shock-Equal than in the Deterministic-Equal treatment. Bejarano et al. (2018) find that the behavior of second movers who do not experience the negative random shock is not statistically different from their behavior when they initially receive the same endowment as the first-mover (0.35 vs. 0.32, $p = .94$). As a result, we find no supportive evidence for the assumption that the expected endowment of the second-mover serves a reference point to them when negative random shocks are possible. Instead, we find support for our assumption that second-movers use their initial endowment as the reference point.

4 | CONCLUSION

This paper investigates whether (and how) different distributions of wealth influence the levels of trust and trustworthiness when we vary the *source* of the distribution. In addition to testing whether relatively rich people trust relatively poorer people more or less than they trust others with the same wealth as themselves, our primary interest is to test whether people exhibit the same trusting behavior towards "originally rich" and "newly rich" people. In the process of answering these questions we also study (i) how the occurrence of the random positive shock affects the level of trustworthiness of those who are affected by the positive random shock, and (ii) whether people who experience the shock use their initial endowment as a reference point.

We consider a variation of the trust game in which the occurrence of positive random shocks (i.e., the outcome of a die roll) can eliminate an existing inequality (in favor of the first-mover) by increasing the endowment of the second-mover. Our results suggest that first-movers (i) trust second-movers with the same endowment as themselves *more* than relatively poorer second-movers, but (ii) trust second-movers who are lucky and obtain the same endowment as the first-mover after the occurrence of a positive random shock *less* than second-movers who had the same endowment from the outset. As for the level of trustworthiness, our results suggest that second-movers (i) are *less* trustworthy when they have a relatively lower endowment than first-movers, and (ii) they are *more* trustworthy after having been lucky and experiencing a positive random shock that increases their endowment. As a policy implication, these findings suggest that if a government decides to implement lump-sum transfers aimed at reducing inequality, these transfers could have a potential spillover effect increasing the level of reciprocity of those who receive them. On the other hand, these transfers could also diminish feelings of trust towards those who have received the transfers. Hence, our findings point out that positive random shocks can be detrimental for the level of trust and can damper economic exchange, as a result.

Our findings are consistent with previous evidence suggesting that the distribution of wealth is important in explaining behavior in the trust game (e.g., Brülhart & Usunier, 2012; Calabuig et al., 2016; Ciriolo, 2007; Hargreaves-Heap et al., 2013; Lei & Vesely, 2010;

Smith, 2011; Xiao & Bicchieri, 2010). However, we add a new perspective to the existing literature by showing that it is also important to take the *source* of the distribution into account. In particular, we show that second-movers behave differently depending on whether they originally have the same endowment as first-movers or whether this equality is the result of a random positive shock. Our finding that second-movers are more trustworthy in the latter case is in line with theories of affect (George & Dane, 2016; Lerner et al., 2015; Loewenstein, 2005) and the possibility that good luck and positive emotions foster pro-social behavior (Capra, 2004; Kidd et al., 2013; Matarazzo et al., 2020). It is also possible that second-movers attribute their good luck to first-movers, or that they perceive that reciprocity is a social norm and they would be more likely to comply with it after the occurrence of the positive random shock. To gain a more comprehensive understanding of how positive random shocks influence trustworthiness, future research could further explore the underlying mechanisms that drive the behavior of second-movers.

Our finding that people trust lucky individuals less is puzzling. We posit that if first-movers are altruistic and care about decreasing the level of inequality they should send more to second-movers who have a lower endowment, which is not observed in our data. If first-movers behavior is driven by self-interest we would expect them to send more to those who have experienced a positive random shock, since it seems quite likely that a second-mover who has just experienced an increase in their endowment will return a higher share of the available funds. Instead, we find the opposite in first-movers. How can we reconcile these findings?

One possible explanation is that first and second-movers have different reference points. It may be possible that second-movers who experience the random positive shock respond to the shock by returning more but first-movers do not anticipate this behavior; for example, because the effects of the shock are more salient to second-movers. If that were the case, however, one would expect no effect of the shock on the behavior of first-movers. Arguably, first-movers react to the shock by sending *less* to lucky second-movers. A recent paper by Buchanan (2020) suggests that people cannot predict how others will behave because they fail to anticipate the reference point of others. Cox et al. (2008, 2016), Chaudhuri and Gangadharan (2007) or Houser et al. (2008), among others, highlight that altruism, expectations and intentions are likely to influence behavior; in fact, it is possible that the willingness to return depend on the opportunity set of the second-mover who can use the amount received relative to their endowment (or the occurrence of the shock) as a reference point. In this respect, we would need to account for expectation-based preferences, such as disappointment aversion or guilt aversion, which can play a role in our setting, especially because the shock is realized in front of the first-mover. We believe that a fruitful area for future research would be to elicit the reference point of first- and second movers as well as their beliefs regarding the levels of trust and trustworthiness when random shocks are possible. These findings can be useful when modeling the behavior of first- and second-movers in the trust game. We should acknowledge this as a limitation of the current study.

An alternative explanation would be that first-movers hold motivated beliefs; that is, they interpret the occurrence of the shock in a self-serving manner so as to act egoistically. With that in mind, first-movers would be more altruistic or self-interested depending on the source of the inequality. If shocks are not possible first-movers expect second-movers to be inequality-averse. As a result, first-movers send less to second-movers with a lower endowment; that is, they act in a self-interested manner. The occurrence of the positive random shock makes the issue of inequality-aversion more salient and makes the behavior of first-movers more influenced by notions of altruism. Seeing the second-mover experiencing a positive random shock makes the idea that second-movers do not deserve any more money more prominent. As a result, first-movers decide to send less to second-movers who have experienced a positive random shock.[19]

The idea that first-movers are self-serving in the interpretation of the shock to act egoistically is consistent with the recent findings in Bejarano et al. (2018) where negative random shocks can occur in the trust game. In their setting, first-movers send less to second-movers who experience the negative random shock, possibly because they expect to receive less from them in return. If a negative shock occurs to second-movers, first-movers anticipate that second-movers will reciprocate less, *but* if a positive random shock occurs to second-movers, they do not behave in a way that is consistent with expecting a higher return from second-movers. Instead, first-movers may believe that there is already a mechanism that eliminated the inequality thus they do not need to compensate second-movers who experienced the positive random shock.

The possibility of motivated beliefs is also consistent with evidence from redistribution problems suggesting that people choose different allocations depending on whether or not random shocks affected their production (Deffains et al., 2016; Rodriguez-Lara & Moreno-Garrido, 2012). In a recent paper, Bejarano, Corgnet, and Gómez-Miñambres (2021) examine how changes in economic conditions can affect the productivity of workers in a gift-exchange game. They show that employers are reluctant to increase wages during expansions, but they do cut wages during recessions. Their interpretation of the data is that employers are self-serving, thus they do not compensate workers sufficiently when the economy grows and productivity levels increase.

Our research opens up other interesting avenues for future research as well. For example, there is overwhelming evidence that people respond differently to inequalities that result from a random process and those that result from choices or merit, for instance in the context of redistribution (Akbaş et al., 2019; Alesina & Angeletos, 2005; Cappelen et al., 2007, 2013; Cherry et al., 2002; Deffains et al., 2016; Durante et al., 2014; Jimenez-Jimenez et al., 2020; Konow, 2000; Krawczyk, 2010; Mollerstrom et al., 2015; Rodriguez-Lara & Moreno-Garrido, 2012). Thus, it may be worth investigating how trust and trustworthiness are affected by random shocks when the initial endowments can be determined by luck or affected by performance in a real-effort task. A relevant paper within this line of research is Fehr et al. (2018). They explore how inequality affects the behavior in the trust game when participants receive different endowments depending on their performance in a real-effort task. Fehr et al. (2018) find that induced inequality affects the levels of trust and trustworthiness depending on the extent to which this is deemed fair by participants. They do not consider the possibility of random shocks. The current experiment suggests a setting with real-effort and random shocks may be worth considering.

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[19]In a way, we examine the behavior of first- and second-movers in isolation. Our data could be interpreted as evidence that first-movers hold wrong expectations of how much second-movers return, or they are not be able to anticipate their behavior after the realization of the random shock. It is also possible that first-movers do anticipate the behavior of second-movers but they hold motivated beliefs and interpret the realization of the shock in a self-serving manner to act egoistically. As noted above, the elicitation of beliefs in our game would be a fruitful area for future research.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX A

A.1 | Experimental instructions: Deterministic-Equal treatment

ID: _____A[20]

A.2 | Welcome to the experiment!

You are about to participate in a decision making experiment. You will be able to earn money in this experiment. How much you earn depends on your decisions and on the decisions of other participants in the experiment.

In this experiment there are two types of players. We call them A and B. Each player A will be randomly matched with a player B in the other room.

Everybody in this room has been randomly assigned to be *player A*.

Except for the type of players, instructions are the same for both player A and B. Every player A and B will receive an envelope with 21 Experimental Dollars E$. Players A get to decide first. Each A will have to decide how much of their initial E$—some, all, none of it—to send to the paired B. Each E$ sent to player B will be tripled. For example (and the numbers used in these examples are picked for clarification purposes only), if player A sends 2 E$ to the player B he/she is matched with, B will receive 6 E$. If a player A sends 9E$ to his/her paired player B, B will receive 27 E$.

Players B will subsequently have to decide how many E$ to send back to their paired player A, keeping the remainder amount. For example (and again the numbers used in these examples are picked for clarification purposes only), if A sends 2 E$ to B, B will receive 6 E$. If B decides to return 5 E$, A will end up with 24 E$ (21–2 + 5), B with 22 (21 + 6–5). If Player A sends 9 E$ to B, B will receive 27 E$. If B decides to return 15 E$, A will end up with 27 E$ (21–9 + 15) and B with 33 (21 + 27–15).

Summarizing, the number of E$ will be computed as follows:

E$ Player A = 21 E$ − E$ sent to B + E$ received from B.

[20]These are the original instructions for the first-mover (Player A) in the Deterministic-Equal treatment. The second-mover (Player B) receives the exact same instructions, except for the role. In the Deterministic-Unequal treatment, we only change the amount that corresponds to the endowment of the second-mover.

E$ Player B = 21 E$ + 3 × E$ received from A − E$ sent to A.

E$ will be converted to actual dollars at the end of the experiment (*1 E$* = *$0.5*).

Please do not talk with the other participants during the experiment. If you need any help, or have difficulties understanding the instructions, please raise your hand and ask the instructor privately. It is important that you understand the instructions before we start.

A.3 | Experimental procedure and records

1. You will find an envelope with your experimental ID and 21 E$. Please write down the same number on this sheet.
2. For each person in this room, we will draw a number from an urn with all the experimental IDs of players B in the other room. This number is the experimental ID of your paired player B. Neither you nor we will ever know more than his/her experimental ID.
3. Choose how many E$ bills to send to your paired player B and keep the rest with you. Leave the E$ you want to send in the envelope.
4. In the first column of Table A1, write the number of bills you want to send.
5. We will collect all the envelopes in this room. E$ contained in the envelopes will be multiplied by 3 and added back.
6. Your envelope will be given to the player B with the ID number randomly assigned to you.
7. Player B will count the E$ that he/she receives and will decide how many E$ to send back to you.
8. The envelopes will be collected and returned back to you with the amount B chooses to return.
9. Count the bills that you received inside the envelope.
10. In the second column of Table A1, write the number of bills you received from Player B. Put all your E$ in the envelope with your ID.
11. We will collect all envelopes in the room, and call you to exchange E$ for U$S dollars. You should present this record sheet to be paid.

A.4 | Experimental instructions: Shock treatments

A.4.1. | Welcome to the experiment!

You are about to participate in a decision making experiment. You will be able to earn money in this experiment. How much you earn depends on your decisions and on the decisions of other participants in the experiment.

In this experiment there are two types of players. We call them A and B. Each player A will be randomly matched with a player B in the other room.

Everybody in this room has been randomly assigned to be **player A**.

Except for the type of players, instructions are the same for both player A and B. Every player A will receive an envelope with 21 Experimental Dollars E$. Every player B will receive

TABLE A1 Decision records table.

A My ID___	My B's ID___
I sent	I received back

initially an envelope with 7 E$. Players A get to decide first. Each A will have to decide how much of their initial E$—some, all, none of it—to send to the paired B. Each E$ sent to player B will be tripled. For example (and the numbers used in these examples are picked for clarification purposes only), if player A sends 2 E$ to the player B he/she is matched with, B will receive 6 E$. If a player A sends 9E$ to his/her paired player B, B will receive 27 E$.

Before player A makes a decision about the number of E$ to send we will roll a die in front of each player A. If the number is odd (1, 3, or 5), the amount of E$ in the envelope of the player B to whom player A will be paired will be increased by 14 E$. As a result the player B to whom player A will be matched with will have an envelope with 21 E$ instead of the original 7 E$. If the number is even (2, 4, or 6), the player B to whom player A will be paired keeps 7 E$ in his/her envelope.

Players B will subsequently have to decide how many E$ to send back to their paired player A, keeping the remainder amount. Players B will learn the outcome of the die and the amount of E$ sent by player A before making his/her decision. For example (and again the numbers used in these examples are picked for clarification purposes only), if the increase took places (i.e, the number was odd) and A sends 2 E$ to B, B will receive 6 E$. If B decides to return 5 E$, A will end up with 24 E$ (21–2 + 5), and B with 22 E$ (7+ 14 + 6–5). If the increase did not take place (i.e., the number was even), and A sends 2 E$ to B, B will receive 6 E$. If B decides to return 5 E$, A will end up with 24 E$ (21–2 + 5), and B with 8 E$ (7 + 6–5).

Similarly, if player A sends 9 E$ to B, B will receive 27 E$. If B decides to return 15 E$, A will end up with 27 E$ (21–9 + 15) and B with 19E$ (7+ 27–15) or 33E$ (21 + 27–15) depending on whether E$ are increased or not from their initial endowment.

Summarizing, the number of E$ will be computed as follows:

E$ Player A = 21 E$ − E$ sent to B + E$ received from B.
E$ B = 7E$ + 14 (Increase, if applicable) + 3 × Points received from A − Points sent to A.

Remember that when players A make their decision about how many E$ to send, once he/she knows whether the increase of B's initial amount took place or not.

E$ will be converted to actual dollars at the end of the experiment (1 E$ = $0.5).

Please do not talk with the other participants during the experiment. If you need any help, or have difficulties understanding the instructions, please raise your hand and ask the instructor privately. It is important that you understand the instructions before we start.

A.5 | Experimental procedure and records

1. You will find an envelope with your experimental ID and 21 E$. Please write down the same number on this sheet.
2. For each person in this room, we will draw a number from an urn with all the experimental IDs of players B in the other room. This number is the experimental ID of your paired player B. Neither you nor we will ever know more than his/her experimental ID.
3. We will roll a die in front of you and the result will determine if E$ are increased (odd numbers: 1, 3, or 5) or not (even numbers: 2, 4, or 6) from the initial 7 E$ of the player B you are matched with. In the first column of Table A2, write the result of the die and whether initial $E are reduced for the player B you are matched with.
4. Choose how many E$ bills to send to your paired player B and keep the rest with you. Leave the E$ you want to send in the envelope.

5. In the envelope, you will find an *outcome card* like this:

Message from player A to player B:
1. I have been matched with player B's ID _______
2. You had a 50% probability of getting your original amount increased with 14 $E.
3. The number on the die was _____
4. Your original amount of 7 $E was (increased / not increased) from 7E$ to 21$E.

Please write the outcome of the die and underline the appropriated sentence (increased/not increased). Put the outcome card back to the envelope.

6. In the first column of Table A2, write the number of bills you want to send.
7. We will collect all the envelopes in this room. E$ contained in the envelopes will be multiplied by 3 and added back.
8. Your envelope and the message will be given to the player B with the ID number randomly assigned to you.
9. Player B will count the E$ that he/she receives and will decide how many E$ to send back to you.
10. The envelopes will be collected and returned back to you with the amount B chooses to return.
11. Count the bills that you received inside the envelope.
12. In the second column of Table A2, write the number of bills you received from Player B. Put all your E$ in the envelope with your ID.
13. We will collect all envelopes in the room, and call you to exchange E$ for U$S dollars. You should present this record sheet to be paid.

TABLE A2 Decision records table.

A My ID___	My B's ID___
The number in the die was ______ B's initial $E are increased? Y/N	
I sent	I received back

APPENDIX B

B.1 | Amount sent by first-movers

Figure B1 displays the distributions of the amount sent by first-movers in each of the treatments. We set the number of bins to 21 (i.e., width equals to 1). Table B1 shows descriptive statistics.

B.1.1. | Share returned by second-movers

Figure B2 displays the distributions of the share returned by second-movers in each of the treatments. We set the number of bins to 20 (i.e., width equals to 0.05). Table B2

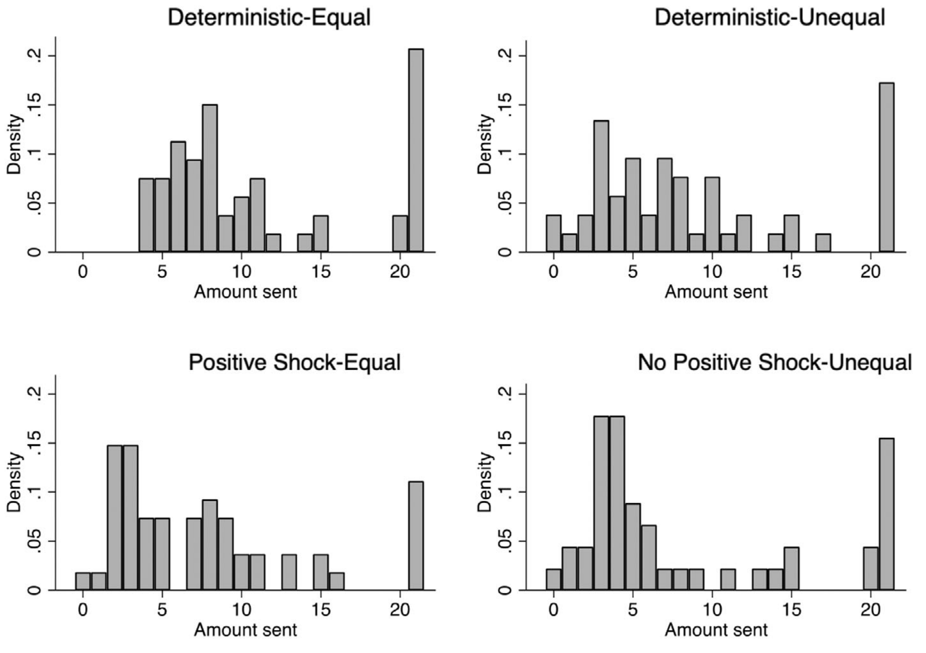

FIGURE B1 Amount sent by first-movers in each treatment.

TABLE B1 Amount sent by first mover.

	Endowment	*N*	Mean	Std. dev.	Percentage of send nothing	Min	Max
Deterministic-Equal	(21, 21)	53	11.13	(6.13)	0	4	21
Positive shock-Equal	(21, 21)	54	7.80	(6.08)	0.03	0	21
Deterministic-Unequal	(21, 7)	52	9.15	(6.65)	0.04	0	21
No positive Shock-Unequal	(21, 7)	45	8.42	(7.14)	0.02	0	21

Note: *N* refers to number of first-movers in each treatment.

shows descriptive statistics.[21] This includes the Spearman correlation coefficient between the amount received by second-movers and the proportion they return to first-movers.

We note that all the previous results hold, except for the comparison between the Deterministic-Equal versus Deterministic-Unequal (first-movers), which is insignificant ($p > 0.145$). There are also some differences that become weakly significant (e.g., second-movers in Deterministic—equal versus Positive shock—Equal $p < .094$) (Tables B3, B4).

[21]We note that there is a second-mover who returns more than what she received in the Shock-Equal treatment. We code this observation as share return equals to 1 but all our results are robust if we do not constraint this observation.

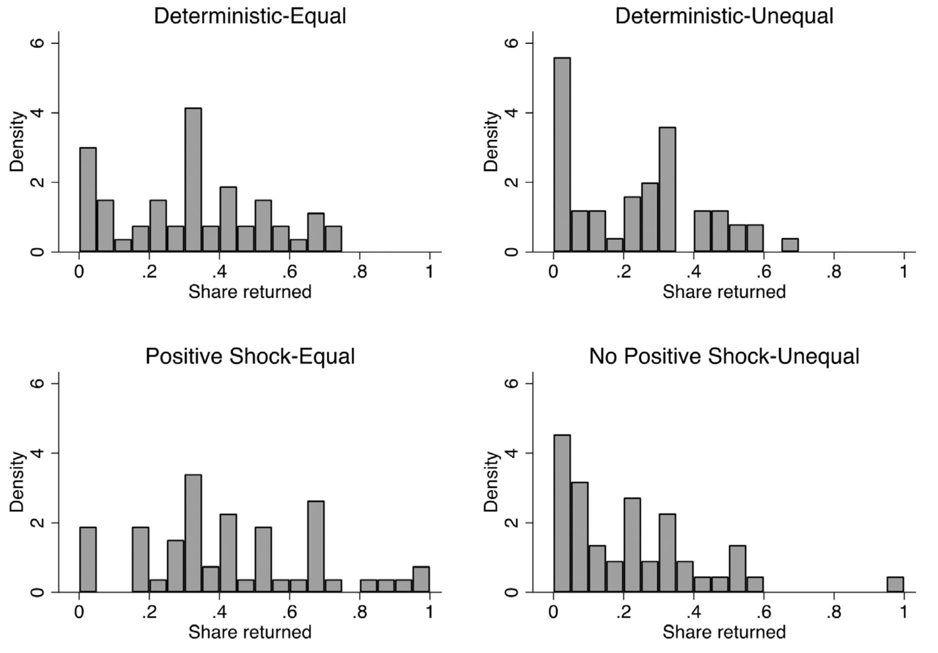

FIGURE B2 Share returned by second-movers in each treatment.

TABLE B2 Share of available funds returned by the second-movers.

	Endowment	N	Mean	Std. dev.	Percentage of return nothing	Min	Max	Corr.
Deterministic-Equal	(21, 21)	53	0.32	(0.21)	0.11	0	0.75	−0.02
Positive Shock-Equal	(21, 21)	53	0.43	(0.25)	0.06	0	1	−0.22
Deterministic-Unequal	(21, 7)	50	0.23	(0.19)	0.22	0	0.67	0.47***
No positive shock-Unequal	(21, 7)	44	0.21	(0.21)	0.20	0	1	0.53***

Note: *N* refers to the number of second-movers in each treatment that received a positive amount from first-movers and then could decide how much to return. Significance at $^{***}p < .001$, $^{**}p < .01$ and $^{*}p < .05$ level (for two-tailed analysis).

TABLE B3 Robust rank-order test (Feltovich, 2003; Fligner & Policello, 1981) for the amount sent by first-movers and the share returned by second-movers.

	Behavior of first-movers		Behavior of second-movers	
	Averages	*p* value	Averages	*p* value
Deterministic-Equal versus Deterministic-Unequal	11.13 versus 9.15	(.048)	0.32 versus 0.23	(.024)
Positive Shock-Equal versus No Positive Shock-Unequal	7.80 versus 8.42	(.891)	0.43 versus 0.21	(.000)
Deterministic-Equal versus positive Shock-Equal	11.13 versus 7.80	(.001)	0.43 versus 0.32	(.042)
Deterministic-Unequal versus No Positive Shock-Unequal	9.35 versus 8.42	(.298)	0.23 versus 0.21	(.518)

TABLE B4 Non-parametric analysis for the amount sent by first-movers and the share returned by second-movers (correcting for multiple comparisons using the Holm-Bonferroni method).

	Behavior of first-movers		Behavior of second-movers	
	Mann–Whitney	Robust rank-order	Mann–Whitney	Robust rank-order
Deterministic-Equal versus Deterministic-Unequal	1.969 (0.147)	1.973 (0.145)	2.189* (0.085)	2.249* (0.073)
Positive Shock-Equal versus no positive shock-Unequal	0.141 (0.889)	0.138 (0.891)	4.349*** (0.000)	5.116*** (0.000)
Deterministic-Equal versus Positive Shock-Equal	3.129*** (0.003)	3.302*** (0.004)	1.985* (0.094)	2.029* (0.085)
Deterministic-Unequal versus no positive shock-Unequal	1.066 (0.288)	1.042 (0.298)	0.659 (0.513)	0.649 (0.518)

Note: We report the Z scores for both tests. The corrected p-values after using the Holm-Bonferroni method appear in brackets. Significance at $^{***}p < .01$, $^{**}p < .05$, and $^{*}p < .10$ level (for two-tailed analysis).

APPENDIX C

In this Appendix, we derive the optimal behavior of first and second-movers when they are inequality-averse. Ley e_i denote the level of endowment of player $i \in \{1,2\}$, where $i=1$ $(i=2)$ stands for the first-mover (second-mover) and $e_1 \geq e_2 > 0$. The first-mover decides the amount $X \in [0,\ e_1]$ to send to the second-mover, who has to choose the amount Y to return. We define the return rate $y \in [0,1]$ as the share of the available funds that second-movers return to first-movers; that is, $y = Y/3X$. We denote π_i the final payoffs of each of player $i \in \{1,2\}$, which is determined as follows:

$$\pi_1 = e_1 - X + Y = e_1 + X(3y-1), \tag{C1}$$

$$\pi_2 = e_2 + 3X - Y = e_2 + 3X(1-y). \tag{C2}$$

Our model of inequality-aversion assumes that players dislike payoff differences (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999) by considering the following utility function[22]:

$$u_i = \pi_i - \alpha_i \left(\pi_i - \pi_j\right)^2, \tag{C3}$$

where π_i and π_j are given by equations (1) and (2) and $\alpha_i \geq 0$ measures the extent to which player i is concerned about the inequality, where $i,j \in \{1,2\}$ and $i \neq j$. In principle, we could

[22]Our model is just for illustration purposes to show how inequality can affect choices in the trust game, depending on whether or not we account for reference points (Fahle & Sautua, 2021). We acknowledge some limitations of our model; for example, in Equation (C3) we impose symmetry between advantageous and disadvantageous inequality.

solve for the optimal return rate of second-movers in Equation (C3) by using the values of π_1 and π_2 in Equations (C1) and (C2). This will lead to the optimal return in Equation (C4), which depend on the difference between $e_2 - e_1$; that is, second-movers will return less when there is an inequality in favor of the first-mover (Prediction 1a).

$$y^* = \frac{2}{3} - \frac{1}{24X\alpha_2} + \frac{e_2 - e_1}{6X}. \tag{C4}$$

To account for reference points, we need to modify Equation (C2) and consider that second-movers evaluate any "gain-loss" utility from their initial endowment using a reference point (r). We assume that second-movers use the function $f(e_2|r) = e_2 + f(e_2, r)$, therefore Equation (C2) can be written as follows:

$$\pi_2 = f(e_2|r) + 3X - Y = e_2 + f(e_2, r) + 3X(1-y), \tag{C5}$$

where the value of $f(e_2, r)$ depends on whether the final endowment of second-movers is above or below their reference point (r), in particular:

$$f(e_2, r) = \begin{cases} \eta(e_2 - r) & \text{if } e_2 \geq r \\ \eta\lambda(e_2 - r) & \text{if } e_2 < r \end{cases}, \tag{C6}$$

where $\eta \geq 0$ and that $\lambda > 1$ to account for the fact that losses loom larger than equal-sized gains. In this model, there is a gain in utility $f(e_2, r) = \eta(e_2 - r) \geq 0$ when second-movers receive a *positive shock*; that is, when their new endowment is above their reference point $e_2 \geq r$. When the endowment of the second-movers falls below a reference point $e_2 < r$ then there is a loss in utility $f(e_2, r) = \eta\lambda(e_2 - r) < 0$.

If we derive the optimal return of second-movers using Equations (C1), (C3) and (C5) we will obtain the following:

$$y^* = \frac{2}{3} - \frac{1}{24X\alpha_2} + \frac{e_2 - e_1}{6X} + \frac{f(e_2, r)}{6X}. \tag{C7}$$

This equation, in turn, implies that second-movers will be more (less) reciprocal if their endowment is above (below) their reference point; that is, the value of $f(e_2, r)$ determines their level of trustworthiness.

In our paper we assume that second-movers use the "status-quo" or their initial endowment as reference point (Baillon et al., 2020; Masatlioglu & Ok, 2005). In the Deterministic-Equal and the Deterministic-Unequal treatments $f(e_2, r) = 0$ because there is no change in the endowment of second-players ($e_2 = r$). The same occurs in the No Positive Shock-Unequal treatments where the endowment of the second-mover is not affected by the roll of the die.[23] In the No Positive Shock-Unequal treatment, however, it holds that $f(e_2, r) = \eta(e_2 - r) \geq 0$ because the endowment

[23]Note that $f(e_2, r) = \eta\lambda(e_2 - r) < 0$ in the No Positive Shock-Unequal treatment if we assumed that the second-movers use their expected endowment $r = 14$E\$ as a reference point. In that is the case, their final endowment $e_2 = 7$ E\$ would satisfy $e_2 < r$.

of the second-movers changes after rolling the die; in fact, there is a gain in utility for these second-movers who are lucky and see their endowment increase (Prediction 1b).

Next, we look at the behavior of first-movers. If first-movers are inequality averse, their behavior depends not only on their degree of inequality aversion $(\alpha_1 \geq 0)$, but also on their beliefs about the inequality aversion of second-movers $(\alpha_2 \geq 0)$. This can be seen from the maximization problem of inequality-averse first-movers:

$$\max \quad u_i = \pi_i - \alpha_i \left(\pi_i - \pi_j\right)^2, \tag{C8}$$

$$\text{s.t. } y = E(y|X.),$$

where $\pi_1 = e_1 + X(3y-1)$, $\pi_2 = f(e_2|\,r) + 3X(1-y)$, and $y = E(y|X)$ denotes the expected return from second-movers.

To derive testable predictions, we consider two different possibilities. First, we assume that first-movers have altruistic preferences. Second, we consider the possibility of self-interested first-movers who expect reciprocal behavior from second-movers but try to maximize their own payoff; that is, first-movers who are self-interested maximize their utility subject to expecting a positive return from inequality-averse second-movers that is given by Equations (C5) or (C7).

Case 1. First-movers are altruistic $(E(y|x) = 0)$

Consider the case in which first-movers expect to receive nothing back from second-movers $(E(y|x) = 0)$. In this case, an altrusitc first-mover who is inequality averse will behave so as to reduce inequalities. To see this it is worth noting that

$$\pi_1 - \pi_2 = e_1 + X(3y-1) - e_2 - 3X(1-y) = e_1 - e_2 + 3yX - X - 3X + 3Xy = e_1 - e_2 + 6yX - 4X. \tag{C9}$$

Thus, the first-mover solves:

$$\max u_1 = e_1 + X(3y-1) - \alpha_1 \left(e_1 - e_2 + 6yX - 4X\right)^2,$$

$$\text{s.t} \, y = E(y|x) = 0.$$

If we replace the value of y into the utility function of the first-mover:

$$u_1 = e_1 - X - \alpha_1 \left(e_1 - e_2 - 4X\right)^2.$$

Taking derivatives with respect to the amount to send we obtain the first-order condition:

$$-1 - (2\alpha_1)(-4)(e_1 - e_2 - 4X) = 0,$$

$$8\,\alpha_1(e_1-e_2-4X)=1.$$

After doing some algebra we derive the amount to be sent by first-movers:

$$X=\frac{e_1-e_2}{4}-\frac{1}{32\,\alpha_1}.$$

As a result, first-movers who are inequality averse will trust more when they are richer and second-movers are poorer; that is, the difference in the endowment (e_1-e_2) has a positive effect on the amount that first-movers send to second-movers (Prediction 2a). In this context, it is also important to account for the degree of inequality aversion of first-movers (α_2).

In principle, we can also derive the behavior of first-movers who are altruistic, but anticipate that second-movers will obtain an extra utility when the random shock is realized (Prediction 2b). If that setting, we need to account for the extra utility of second movers thus Equation (C10) needs to be modified as follows:

$$\pi_1-\pi_2=e_1+X(3y-1)-e_2-f(e_2,r)-3X(1-y)=e_1-e_2+6yX-4X-\eta\,(e_2-r). \tag{C10}$$

Using the same logic as above, we can derive the behavior for first-movers to see that the amount sent decreases when the second-mover experiences the positive random-shock:

$$X=\frac{e_1-e_2}{4}-\frac{1}{32\,\alpha_1}-\frac{\eta\,(e_2-r)}{4}.$$

Case 2. First-movers expect a positive return from second-movers $(E(y|x)>0)$.

Consider that first-movers are inequality averse and expect from second-mover to return $y=E(y|x)=y^*(X)$. Under the assumption that second-movers are inequality averse and use their initial endowment as a reference point, the optimal return of the second-mover is given by:

$$y=\frac{2}{3}-\frac{1}{24X\,\alpha_2}+\frac{e_2-e_1}{6X}+\frac{\eta\,(e_2-r)}{6X}.$$

If we use Equation (C9) and replace the value of y into the utility function of the first-mover:

$$u_1=e_1+3X\left(\frac{2}{3}-\frac{1}{24X\,\alpha_2}+\frac{e_2-e_1}{6X}+\frac{\eta\,(e_2-r)}{6X}\right)$$
$$-X-\alpha_1\left(e_1-e_2+6X\left(\frac{2}{3}-\frac{1}{24X\,\alpha_2}+\frac{e_2-e_1}{6X}+\frac{\eta\,(e_2-r)}{6X}\right)-4X\right)^2,$$

$$u_i=e_1+2X-\frac{1}{8\,\alpha_2}+\frac{e_2-e_1}{2}+\frac{\eta\,(e_2-r)}{2X}$$
$$-X-\alpha_1\left(e_1-e_2+\frac{12X}{3}-\frac{1}{4\,\alpha_2}+e_2-e_1+\eta\,(e_2-r)-4X\right)^2,$$

$$u_1 = e_1 + X - \frac{1}{8\,\alpha_2} + \frac{e_2 - e_1}{2} + \frac{\eta\,(e_2 - r)}{2X} - \alpha_1 \left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r) - 4X\right)^2,$$

$$u_1 = e_1 + X - \frac{1}{8\,\alpha_2} + \frac{e_2 - e_1}{2} + \frac{\eta\,(e_2 - r)}{2X} - \alpha_1 \left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r) - 4X\right)^2.$$

Taking derivatives with respect to the amount to send we obtain the first-order condition:

$$1 - \frac{\eta\,(e_2 - r)}{2X^2} - (2\,\alpha_1)(-4)\left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r) - 4X\right) = 0,$$

$$1 - \frac{\eta\,(e_2 - r)}{2X^2} + 8\,\alpha_1\left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r) - 4X\right) = 0,$$

$$1 - \frac{\eta\,(e_2 - r)}{2X^2} + 8\,\alpha_1\left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r)\right) - 36\,\alpha_1 X = 0,$$

$$2X^2 - \eta\,(e_2 - r) + 16X^2\,\alpha_1\left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r)\right) - 72\,\alpha_1 X^3 = 0,$$

$$2X^2\left(1 + 8\,\alpha_1\left(\frac{1}{4\,\alpha_2} + \eta\,(e_2 - r)\right) - 36\,\alpha_1 X\right) - \eta\,(e_2 - r) = 0.$$

As we are concerned with the possibility that first- and second-movers are inequality averse let us assume that $e_2 = r$ that is, there is no reference-depedent utility.

This, in turn, implies that the first-order condition can be written as follows:

$$2X^2\left(1 + 8\,\alpha_1\left(\frac{1}{4\,\alpha_2}\right) - 36\,\alpha_1 X\right) = 0,$$

$$1 + 8\,\alpha_1\left(\frac{1}{4\,\alpha_2}\right) = 36\,\alpha_1 X,$$

$$1 + \left(\frac{2\alpha_1}{\alpha_2}\right) = 36\,\alpha_1 X.$$

The optimal amount to be sent by first-movers is therefore:

$$X = \frac{2\alpha_1 + \alpha_2}{36\,\alpha_1\alpha_2}.$$

And this amount is decreasing in the degree of inequality aversion of second-movers, α_2. A similar argument applies when there is reference-dependent utility using Equation (C10), but the algebra is more complex in that setting.

APPENDIX D

Our paper examines the effects of positive random shocks that affect the wealth of second-movers on levels of trust and trustworthiness. Bejarano et al. (2018) have previously investigated the effects of negative random shocks that affect the wealth of second-movers. In their analysis they have data for a *Deterministic-Equal* treatment (in which first- and second-movers are both endowed with 21 E$) and a *Deterministic-Unequal* treatment (in which first-movers receive 21 E$ and second-movers receive 7E$). Additionally, in their shock treatments first and second-movers are initially endowed with the same amount (21E$). In these treatments, the outcome of a die roll can affect the endowment of the second-mover by reducing their initial endowment in 14 E$. This reduction takes place if the outcome of the die is odd (*Shock-Unequal*). If the outcome of the die is even, then second-movers keep their initial endowment (*Shock-Equal*). In this Appendix we want to compare our current findings with the results in Bejarano et al. (2018) (and additional data we obtained for their Deterministic treatments). Recall that our current design is such that second-movers are initially given 7E$ in the *Shock* treatments, and the outcome of the die roll determines whether second-movers keep their initial endowment (*No Positive Shock-Unequal*) or we give them an extra endowment of 14 E$ (*Positive Shock-Equal*). Table D1 summarizes all the treatment conditions. This includes information on the number of pairs in each treatment.

TABLE D1 Summary of treatment conditions.

		Initial endowments		
Treatment	***N***	**First-mover**	**Second-mover**	
Deterministic-Equal	53	21 E$	21 E$	
Deterministic-Unequal	52	21 E$	7 E$	
Positive Shock-Equal	45	21 E$	7 E$ → 21 E$	The outcome of the die was odd and 14 E$ were increased from the initial endowment of the second-mover.
No Positive Shock-Unequal	54	21 E$	7 E$ → 7 E$	The outcome of the die was even and the second-mover kept her initial endowment.
No Negative Shock-Equal	44	21 E$	21 E$ → 21 E$	The outcome of the die was even and the second-mover kept her initial endowment.
Negative Shock-Unequal	47	21 E$	21 E$ → 7 E$	The outcome of the die was odd and 14 E$ were reduced from the initial endowment of the second-mover.

Note: *N* refers to the number of pairs in each treatment.

D.1. | Predictions of the model and behavior of second-movers

We can use accommodate our model in Appendix C to derive testable predictions regarding the effects of positive and negative random shocks on the behavior of first and second-movers. Recall that second-movers use the function $f(e_2|r) = e_2 + f(e_2, r)$ where the value of $f(e_2, r)$ depends on whether the final endowment of the second-mover is above or below their reference point (r). Following our logic above, we assume that second-movers use their initial endowment as a reference point. This, in turn, implies that second-movers receive a gain in utility $f(e_2, r) = \eta(e_2 - r) \geq 0$ when there is a positive random shock in the Positive Shock-Equal treatment. In the case of a negative random shock in the Shock-Unequal treatment, there is a *loss* in utility $f(e_2, r) = \eta\lambda(e_2 - r) < 0$ because $e_2 < r$. When a shock is possible but not realized (e.g., in the No Negative Shock-Equal or the No Positive Shock-Unequal treatments) there is no gain or loss in utility and $f(e_2, r) = 0$ because $e_2 = r$.

We can compute the optimal return of second-movers under the assumption that they are inequality-averse and have reference-dependent utility. In this setting, second-movers will choose an optimal return y^* that maximizes:

$$u_2 = \pi_2 - \alpha_2(\pi_2 - \pi_1)^2 = e_2 + f(e_2, r) + 3X(1 - y) - \alpha_2(e_2 - e_1 + f(e_2, r) + 2X(2 - 3y))^2,$$

In line with the results reported in the current paper, the optimal return will be given by equation (D1) above:

$$y^* = \frac{2}{3} - \frac{1}{24X\alpha_2} + \frac{e_2 - e_1}{6X} + \frac{f(e_2, r)}{6X}. \tag{D1}$$

As noted, the endowment of the second-mover is constant in the Deterministic-Equal and Deterministic-Unequal treatments; that is, $f(e_2, r) = 0$ because $e_2 = r$. If the reference point does not matter for the behavior of second-movers (i.e., $f(e_2, r) = 0$) they should behave in the same manner in the Deterministic-Unequal and the Negative Shock-Unequal treatments. Arguably, second-movers can use their initial endowment as a reference point when positive and negative random shocks are possible. Bejarano et al. (2018) provide experimental evidence that second-movers return less after the occurrence of a negative random shock; that is, the level of trustworthiness is lower in the Shock-Unequal than in the Deterministic-Unequal treatment. This behavior can be predicted by equation (6) after noting that $f(e_2, r) = \lambda\eta(e_2 - r) < 0$ in the Negative Shock-Unequal treatment, while $f(e_2, r) = 0$ in the Deterministic-Unequal treatment because $e_2 = r$.

Figure D1 depicts the return ratio (i.e., the proportion that second-movers return) in each of the treatments in order to compare the behavior of second-movers when positive and negative random shocks are possible. The results of the non-parametric tests are reported in Table D2 (see Table 3 in the main text for the descriptive statistics).

Consistent with the idea of inequality-aversion, we observe a lower return in the Unequal treatments in which there is inequality in favor of the first-mover, compared with the Equal treatments, in which the first- and the second-mover receive the same endowment. This is observed in all treatment conditions, no matter whether the inequality was initially given in the Deterministic treatments ($p < .028$), was the result of a random shock that decreased the endowment of second-movers in the Negative Shock treatments ($p < .002$) or took place

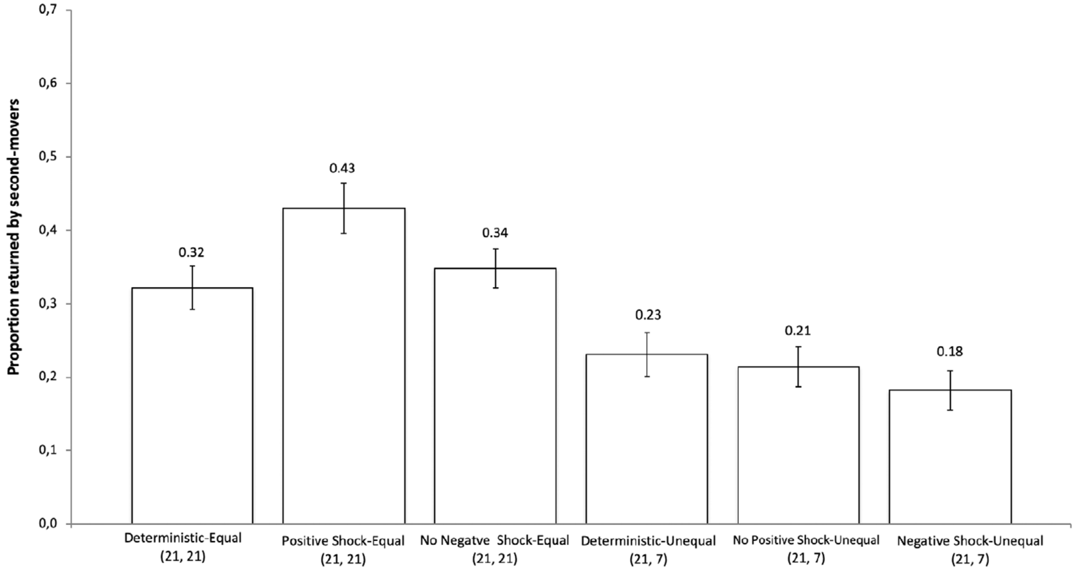

FIGURE D1 Proportion returned by second-movers. Error bars reflect standard errors of the mean.

TABLE D2 Non-parametric analysis for the share returned by second-movers.

	Mann–Whitney test	Robust rank-order test
Deterministic-Equal versus Deterministic-Unequal	2.189**	2.249**
Shock-Equal versus Shock-Unequal	3.120**	3.348***
Positive Shock-Equal versus No Positive Shock-Unequal	4.349***	5.116***
Deterministic-Equal versus Shock-Equal	0.080	0.078
Deterministic-Equal versus Positive Shock-Equal	1.985**	2.029***
Shock-Equal versus Positive Shock-Equal	2.654***	2.775***
Deterministic-Unequal versus Shock-Unequal	2.483***	2.585***
Deterministic-Unequal versus No Positive Shock-Unequal	0.659	0.649

Note: We report the Z scores for both tests. Significance at ***$p < .01$, **$p < .05$ and *$p < .10$ level (for two-tailed analysis).

because the endowment of the second-mover was not increased in the No Positive Shock treatments ($p < .001$). Thus, our data suggest that second-movers are inequality-averse and return less when there is inequality in favor of the first-mover.

To test whether the occurrence of the negative random shock has indeed any effect on the behavior of second-movers (apart from the inequality it may generate) we compare the return ratio in the Deterministic-Unequal and the Shock-Unequal treatment. The results of our non-parametric analysis indicate that second-movers do not behave differently in these two treatments at any common significance level (0.23 vs. 0.18) ($p > 0.935$). However, we found that second-movers return more when a positive shock increases their endowment in the Positive Shock-Equal treatment, compared to how much they return in the Deterministic-Equal treatment (0.43 vs. 0.32) ($p < .047$). Together, these findings indicate that the occurrence of a negative random shock make second-movers less willing to reciprocate, while the occurrence of the positive random shock increases their willingness to return. Interestingly, the reduction in the level of trustworthiness that resulted from the negative random shock is not significantly different from the reduction that resulted from the inequality this shock generates, while the increase in the level of trustworthiness that resulted from the positive random shock is significantly higher than the one that resulted from having the same endowment as the first-mover; in fact, we find that second-movers return significantly more in the Positive Shock-Equal than in the No Negative Shock-Equal treatment ($p < .008$).[24] This implies that second-movers may respond more positively to the occurrence of positive random shocks than they react negatively to the occurrence of negative random shocks. While this finding would be at odds with the idea of loss aversion and the assumption that $\lambda > 1$, it does support the possibility of reversed loss aversion in Harinck et al. (2007). In their paper, subjects are asked to rate how (un)pleasant would be finding (losing) small amounts of money. Harinck et al. (2007) find that negative feelings associated with small losses may be outweighed by positive feelings associated with equivalent small gains. In our setting, this could explain the observed behavior from second-movers if we assume that positive feelings associated to the occurrence of the positive random shocks can outweigh the unpleasant feelings associated to the negative random shock.

One important take-home message from our findings concern the assumption that second-movers use their initial endowment as a reference point. In our setting, it is also possible to assume that second-movers use the expected value of their endowment as a reference point. In that case, one would expect a positive response (i.e., a higher return) from second-movers in the No Negative Shock-Equal treatment where negative random shocks are possible but not realized. Similarly, second-movers would be expected to return less in the No Positive Shock-Unequal treatment where positive random shocks are possible but not realized. Our results in Table D2 do not lend support for this assumption; that is, the behavior of second-movers in the Shock-Equal treatment is not statistically different from their behavior in the Deterministic-Equal treatment ($p > 0.935$), nor it is different the behavior of second-movers in the No Positive Shock-Unequal and the Deterministic-Unequal treatments ($p > 0.173$). We therefore conclude that the possibility that second-movers employ their initial endowment as a reference point is more consistent with our data.

D.2. | Predictions and behavior of first-movers when negative random shocks are possible

Recall that *altruistic* first-movers are trying to reduce the existing inequality. Because they are assumed to expect nothing from second-movers, first-movers should send more if there is inequality in their favor in the Deterministic-Equal treatment, compared with the Deterministic-Unequal treatment. Similarly, they will send more in the Shock-Unequal than in the Shock-Equal treatment, and will send more in the No Positive Shock-Unequal than in the Positive Shock-Equal treatment.

Importantly, first-movers who are altruistic can anticipate the loss (gain) in utility of second-movers if a shock (Shock) has occurred to the second-movers. As a result, we expect first-movers to send more when second-movers have experienced the negative shock, compared

[24]One interesting idea would be to estimate (e.g., using structural estimation) the values of λ or η in the model using the data for positive and negative random shocks. We consider this to be beyond the scope of the current paper.

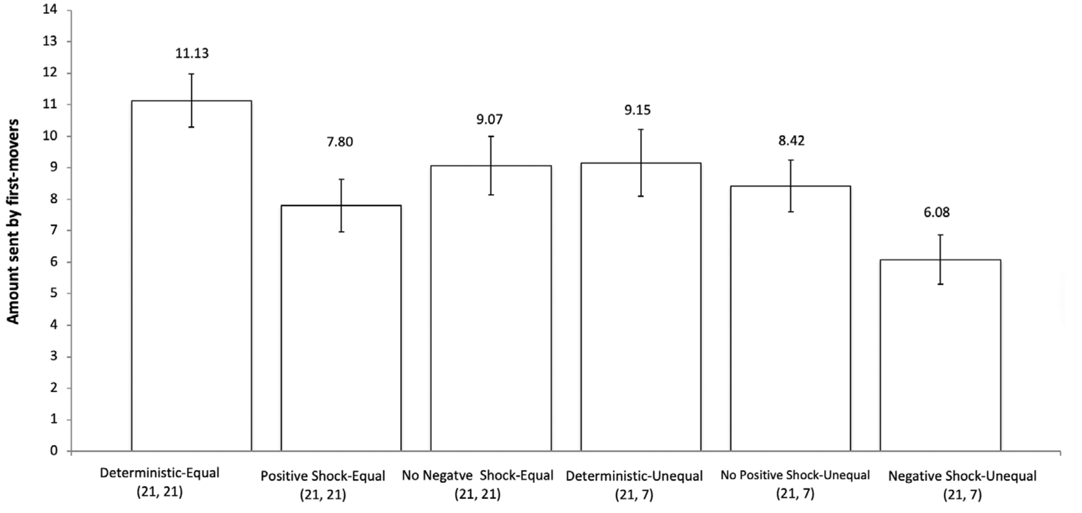

FIGURE D2 Amount sent by first mover. Error bars reflect standard errors of the mean.

TABLE D3 Non-parametric analysis for the amount sent by first-movers.

	Mann–Whitney test	Robust rank-order test
Deterministic-Equal versus Deterministic-Unequal	1.969***	1.973***
Shock-Equal versus Shock-Unequal	2.294***	2.379***
Positive Shock-Equal versus No Positive Shock-Unequal	0.141	0.138
Deterministic-Equal versus Shock-Equal	1.959***	1.928***
Deterministic-Equal versus Positive Shock-Equal	3.129***	3.302***
Shock-Equal versus Positive Shock-Equal	0.890	0.878
Deterministic-Unequal versus Shock-Unequal	2.483**	2.585***
Deterministic-Unequal versus No Positive Shock-Unequal	1.066	1.042

Note: We report the *Z* scores for both tests. Significance at ***$p < .01$, **$p < .05$ and *$p < 0.10$ level (for two-tailed analysis).

with the amount the send to second-movers who were initially endowed with a lower endowment. Similarly, we expect that first-movers will send less to second-movers who received a Shock than to second-movers who are initially given the same endowment than first-movers.

Figure D2 displays the average amount sent by first-movers in every treatment. The results of the non-parametric are reported in Table D3.[25]

When we compare the behavior in the Deterministic-Equal and the Deterministic-Unequal treatments (11.11 vs. 9.15), we find that first-movers send significantly more in the former treatment ($p < .049$). There is also evidence that first-movers send more in the Shock-Equal than in

[25]The Krusall-Wallis indicates that there is a significant difference in the behavior of first-movers in the Equal treatments ($p = .007$). The same conclusion holds when looking at the behavior of first-movers in the Unequal treatments ($p = .041$).

the Shock-Unequal treatment ($p < .022$). Thus we can reject the idea that first-movers are altruistic and are trying to reduce the existing inequality.

A second option that we believe to be of great importance in explaining the behavior of first-movers concerns the possibility that first-movers anticipate that second-movers are inequality averse, but first-movers behave in a self-interested manner to maximize their expected payoff (Smith, 2011). This, in turn, implies that first-movers will send more when they expect to receive more from second-movers; that is, trust will be higher in the absence of wealth inequality. One interesting question along these lines concerns the effect of the negative and the positive random shocks on the behavior of first-movers. Self-interested first-movers can anticipate that inequality averse second-movers will be less likely to reciprocate after experiencing a negative random shock, thus they will send more in the Deterministic-Unequal than the Shock-Unequal treatment. Similarly, they will send more in the Positive Shock-Equal than in the Deterministic-Equal treatment because they will anticipate that second-movers would be more likely to reciprocate if their endowment is the same as the endowment of the first-mover, especially when this is the result of a positive random shock.

The results for the effects of a negative random shock in Bejarano et al. (2018) indicate that first-movers seem to anticipate that second-movers who experience a shock will return less; thus first-movers send more in the Deterministic-Unequal than in the Shock-Unequal treatment (9.15 vs. 6.08) ($p < .013$). As reported in the paper, we do not find evidence that first-movers anticipate that second-movers will be more willing to reciprocate when their endowment is increased in the Positive Shock-Equal treatment; in fact, first-movers send more in the Deterministic-Equal than in the Positive Shock-Equal treatment (11.13 vs. 7.80) ($p = .002$). These results are interesting as they seem to suggest that self-interested first-movers can hold motivated beliefs regarding the behavior of second-movers. When second-movers experience a negative random-shock, first-movers may be likely to believe that second-movers will be less reciprocal, thus they send less to second-movers who suffer a shock. Arguably, first-movers do not seem to follow this reasoning when second-movers receive a Shock; that is, first-movers do not seem to anticipate that second-movers will be more reciprocal after receiving a positive random shock.

While it is possible that first and second-movers have different reference points when choosing the amount to send and the proportion to return, we believe that the behavior of first-movers may be explained assuming that they hold motivated beliefs regarding the behavior of second-movers; that is, first-movers can use the occurrence of the shock in a self-serving manner. If a negative shock occurs to second-movers, first-movers anticipate that second-movers will reciprocate less, *but* if a positive random shock occurs to second-movers, then first-movers believe that there is already a mechanism that eliminates the inequality thus they do not need to send more to second-movers who experienced the positive random shock. This type of behavior would be consistent with the idea that people hold motivated beliefs regarding the behavior of others so as to act egoistically. It is important to elicit the expectations of first-movers regarding the return of second-movers in the different treatments, though.