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Supplementary Materials for

It's not just how the game is played, it's whether you win or lose

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This PDF file includes:

Fig. S9. Proportions of the least important factor by winning status, exchange condition, and intensity of redistribution.
Reference (*37*)

Supplementary Text

Online Implementation The experiment was pre-tested and executed on Amazon Mechanical Turk (AMT). Before conducting the actual experiment, we tested our online platform in 3 separate trials using a modified, shorter version of the game. Both the training session and the game session against another player consisted of 3 rounds. The pilot differed from the experiment in that all participants were paid the same amount ($\$1$), regardless of their outcomes in the game. Participants fully experience our manipulation of opportunities, but they were exposed to mild unequal outcomes (i.e. winning or losing) with no monetary consequences. We recruited approximately 30 participants in each exchange condition and all turkers who participated in any of these trials ($N = 211$) were *not* allowed to participate in the experiment.

We recruited 996 participants for the experiment from AMT. All turkers that participated in our study were located in the US, had a hit approval rate higher that 97%, and had at least 5,000 hits approved. Table S1 details the number of participants and their distribution across our exchange conditions. The recruitment process was as follows. We made a post on AMT offering to participate on "The Swap Game", with a link that took participants to our own website, where we hosted the game. The post description was brief and essentially informed about the average time to commit (approximately 25 minutes) and the payment structure of the game.

A participation fee of \$2.5 dollars was given to all players, regardless of their performance, upon completion of the game and of a 2-minute survey after the game. A winning-bonus of \$5 dollars was offered to the winner of the game. This winning prize remained the same across all card exchange conditions so that participants were exposed to the same amount of economic inequality in the final outcome.

Table S1. Sample by outcome, exchange condition, and intensity.

		Exchange Condition			
	Intensity	**PR**	**RA**	**RE**	**Total**
Winner	High	83	83	81	247
	Low	85	83	83	251
Loser	High	82	83	81	246
	Low	86	83	83	252
Incomplete	High	40	36	29	105
	Low	38	24	31	93
Total		414	392	388	1194

Once turkers decided to participate and clicked on the link, they were taken to our website where we requested a turker identifier (provided by AMT), which allowed us to make sure that only valid AMT users participated in our experiment. Before playing the actual game, participants had to read an "Informed Consent". If they agreed, they were randomly assigned to a card exchange condition and given the proper instructions for the game.

The recruitment process and the randomization of the exchange rules were pursued in separate batches to avoid an overload of the server as much as possible. Four turkers participated twice in the experiment by mistake. We only considered the first time they participated and excluded their second time from the sample reported in table S1. Also, the first 856 participants were randomly assigned to exchange conditions. However, since randomization does not guarantee a balanced distribution of participants across conditions, the rest of the sample ($= 140$ participants) was assigned to exchange conditions such that a balanced sample was obtained. Our analyses show that this differential assignment to the exchange conditions was irrelevant for our outcome variables.

Instructions for all exchange conditions were exactly the same, except for the part where the card exchange was explained. Figure S1 is an example of the instructions given to participants before playing the training session (for the one-card RE condition). We encouraged participants to carefully read these instructions.

The Swap Game

Instructions

Welcome to the Swap Game!

You are about to play a card game against another player in which the final goal is to get rid of all your cards first. Whoever gets rid of their cards first in a given round will win that particular round. You will play 7 rounds, and the final winner will be determined by counting the number of rounds each player won.

How to Play This Game?

For a given round, the goal is to get rid of your cards first. You get rid of cards by 'playing' them: this means putting your card on top of the pile.

To play a card, click on it, and then click 'submit'. This will play the card. Before you hit submit, you have the option of returning the card to your hand. Do this by clicking the card under 'your selection'.

You can only play a card that is higher than the one played by the other player. You cannot play the same card as the one on top of the pile. If you do not have a card higher than the card played by the other player, you must "pass". The order of the cards (from lowest to highest) is:

3 4 5 6 7 8 9 10 Jack Queen King Ace 2

This means that **2 is the highest card** and **3 is the lowest card**. Card suits **do not** play a role in this game. For instance, a Queen of Hearts has the exact same value as a Queen of Diamonds; a 6 of Clubs has the exact same value as a 6 of Spades; and so on.

When one player passes, the player who **did not pass** is allowed to play **any card** he/she wants. After this, the other player must play a card that is higher than the one just played, or else pass again. While there is no limit to the number of times a player may pass, it is not advantageous to do so because it gives the other player the opportunity to get rid of more cards.

At the end of every round, a table will be displayed with the number of rounds you and the other player have won.

Exchange of Cards

At the end of *every* round, you will have to exchange 1 card with the other player. The winner of the previous round has to send the **lowest** card to the loser, while the loser of the previous round has to send the **highest** card to the winner.

First, you will have a training session of 3 rounds, where you play against a robot. Then, you will play a game against a human opponent.

Whenever you are ready to start, click on "I'm ready!".

I'm ready!

Fig. S1. Sample instructions for the one-card RE exchange condition. The red box highlights instructions for the exchange of cards, which changed across exchange conditions.

When they were ready, we had them play 3 rounds of a training session to get familiarity with the game and avoid confusions during the actual competition. Each hand in the training has 9 cards. In the training session, participants played against a simulated opponent that always used the same rule to move cards: to play always the card with the highest value in the hand. Since cards are randomly dealt from a deck, participants could have experienced different training sessions with more or less advantages depending on the hand. To remove this potentially different experience, we fixed the hands that both participants and the simulated opponent received in the 3 training rounds by using a random seed when shuffling the deck. Therefore, all participants played the training session with the same cards. However, some variation in the way participants play the rounds still remains because participants can choose to play different cards in each round.

After finishing the training, participants waited until another player, assigned to the same type of exchange, was already trained and ready to play. In order to avoid long periods of waiting time due to the randomness of the card-exchange assignment, a different exchange condition was randomly assigned every 2 participants. This guaranteed that at least two participants start reading the same instructions more or less at the same time, which helped us reducing the waiting time after the training session.

Nonetheless, some problems occurred during recruitment process. Some participants experienced technical problems with our game and others left the game while they were waiting or playing. When this happened, it also affected their partners. All participants who did not complete all the in-game stages in our study (labeled as "incomplete" in table S1), and therefore did not answer our survey items, were excluded from all our analyses. This accounts for about 17% of the total participants who participated in our game in some form. It is important to remark that these dropped cases affected the game completion of *both* players and therefore their exclusion from our analyses does not properly count as "missing cases" but as unsuccessful recruitments. When at least two players, assigned to the same exchange condition, were in the waiting room, they were paired and the game started. They played 7 consecutive rounds with 9-card hands at the beginning of each round. The exchange of cards proceeds as mentioned in the main text. After the game, a winner and a loser were established based on the number of rounds won and both players answered a short survey. Then, participants were first asked questions about inequality and then about socio-demographics. The average experimental session lasted 26.5 minutes (sd = 7.5).

How to Play the Game The main purpose of the game is to get rid of all cards before the opponent. Participants start the game with a 9-card hand. Player 1 starts by moving any card. After the first move by player 1, the game continues as follows: a player must move a card that is higher than the one played by the opponent. Cards from the lowest value to the highest value go from 3 to 2, with suits making no difference as for the card values. That is, a King of Spades has the same value as a King of Hearts and a 2 of Clubs is higher than a Jack of Hearts. If the opponent has no higher cards, then the other player starts over by moving any card of choice until someone gets rid of all cards and becomes the winner of the round. When this happens, both winner and loser are shown their next hand and are asked to swap cards with their opponent according to the exchange rules they were assigned to. Once the exchange happens, players are shown the cards they sent to their opponent, the cards they received from their opponents, and the new hands after the exchange with which they start the next round.

The game proceeds until the 7th round, after which we count the number of rounds won by each player and establish a winner and a loser of the game. We reveal this information to all participants by displaying on the same page a short pile of coins for the loser and a large pile of coins for the winner with the amounts obtained (i.e. US $2.5 and US $7.5, respectively). This information was shown to all participants across treatments after finishing the game but before starting the survey. This allows all participants to be exposed to the same amount of economic inequality (i.e. US $5), despite the varying ways in which this inequality was produced. We can therefore claim that whatever variation exists in our dependent variables is due to the different ways to exchange cards and not to the variation in the amount of economic inequality observed at the end of the game.

Measures for Inequality of Opportunity Here we introduce a measure for individual opportunities based on the values of cards in a hand. The setting of the "Swap Game" is described as having the following elements: a dyad d of players $\{i, j\}$, who play $r \in [1, 7]$ rounds against each other, each time with a hand of $k \in [1, 9]$ cards. Cards can be mapped into scores, such that $card_k \mapsto card.score_k$. Using this information we compute the following measures:

1. **Score** is an individual-level measure of the strength of cards in all hands across the entire game. Score is computed as

$$Score_{id} = \sum_{r=1}^{7} \sum_{k=1}^{9} card.score_{idrk} \tag{1}$$

2. **HandStrength** is an individual-level measure of the opportunity to win the game, as indicated by the quality of her cards relative to her opponent's. HandStrength is computed as

$$HandStrength_{id} = \frac{Score_{id}}{Score_{id} + Score_{jd}} \tag{2}$$

3. **IoO** is a dyad-level measure for inequality of opportunity, indicated by the relative **Score**$_{id}$

of the player with better cards

$$IoO_d = \frac{Score_{hd}}{Score_{hd} + Score_{ld}} - 0.5 \tag{3}$$

where $i = h$ is the player with higher Score and $j = l$ is the player with lower Score in dyad d. We subtract 0.5 to fix equality of opportunity at zero. For example, in a dyad with high inequality of opportunity both players have a high value in IoO, but one player has a high value in HandStrength, while the opponent a low value.

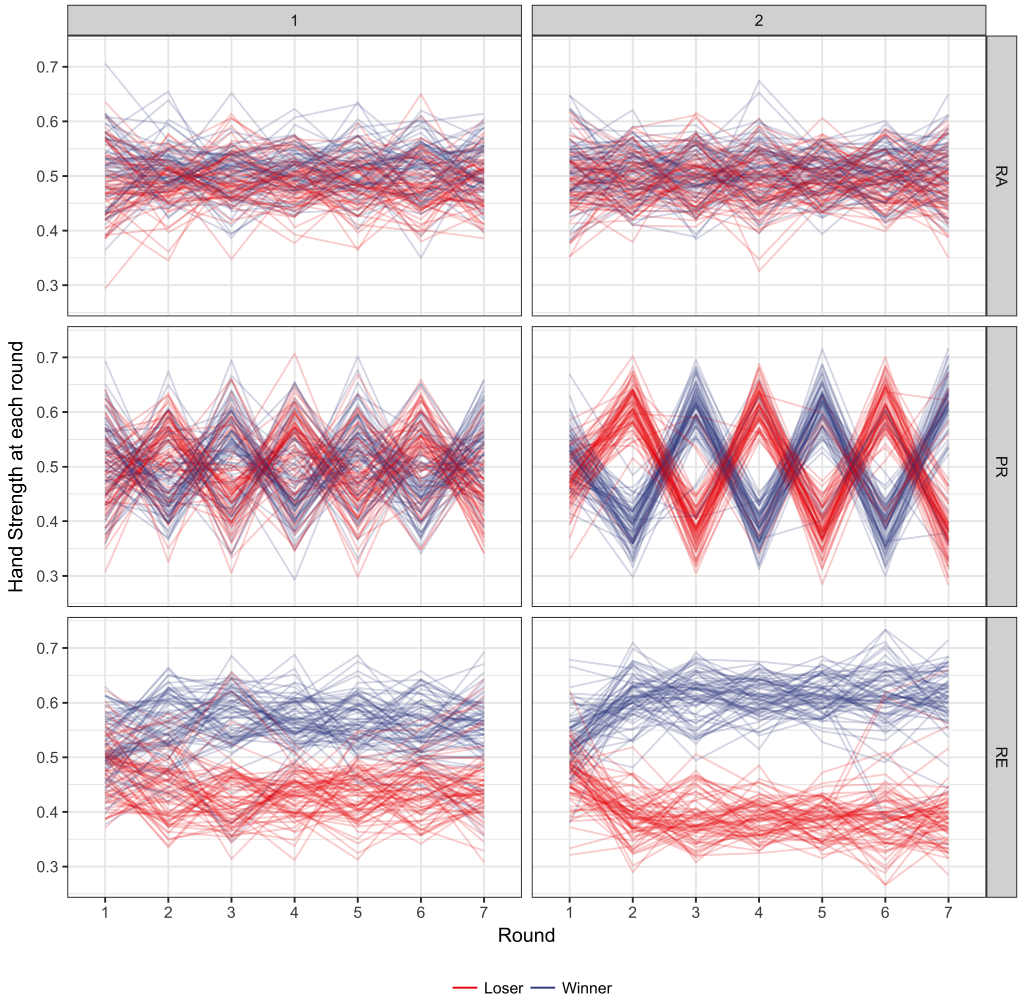

Fig. S2. Individual hand strength across all rounds for winners (blue) and losers (red) by intensity (columns) and direction (rows) of the exchange condition. $N = 822$

Figure S2 shows individual hand strength (based on eq. 2) for all 7 rounds across exchange conditions. Intensity of redistribution is in the columns (one- and two-card exchanges) and direction of redistribution appears in the rows (random, progressive, and regressive exchange conditions). Winners and losers of the game are in blue and red, respectively. As clearly shown, these results confirm that our experimental manipulations worked in the way we expected. In the baseline condition (RA), winners and losers have relatively the same hand strength in all rounds, suggesting they had the same opportunities to succeed in the game. However, PR and RE conditions reveal underlying mechanisms that are fundamentally different insofar as the distribution of opportunity. In the PR condition, winners and losers alternate stronger and weaker hand strengths, while in the RE condition, they retain those advantages or disadvantages, as expected. Intensity works in the expected direction in the PR and RE conditions and respondents' trajectories become clearest in the two-card conditions. As expected, exchanging one or two cards in the RA conditions does not alter the underlying distribution of opportunity in any way.

Table S2. Inequality of opportunity by exchange condition.

	Exchange	Mean IoO	Mean rounds won by winner
1	**RA1**	0.017 (0.013)	4.850 (0.821)
2	**RA2**	0.015 (0.012)	4.790 (0.890)
3	**PR1**	0.011 (0.009)	4.080 (0.275)
4	**PR2**	0.011 (0.009)	4.000 (0.000)
5	**RE1**	0.054 (0.021)	6.320 (1.01)
6	**RE2**	0.099 (0.021)	6.840 (0.606)

Unequal outcomes across different exchange conditions are therefore a discrete manifestation of inequality of opportunity (as measured by IoO). Even though this measure captures a critical manipulation in the experiment, it is not immediately apparent to players and we cannot guarantee that pairs of participants are aware of the small differences in terms of opportunities, since they do not have complete information about opponents' hands. Table S2 displays descriptive statistics (mean and standard deviation) of IoO and the number of rounds won by winners, for all exchange conditions. These results show that our exchange manipulations (i.e. the card-game rules) successfully alter the distribution of opportunity in the way our experimental design intended.

The Role of Individual Skills In our main argument, we sustain that individual outcomes (winning or losing) can be treated as a random assignment. This implies that success or failure in the game is exclusively a function of individual opportunities, determined by luck (i.e. structural and material advantages) and the exchange conditions (i.e. redistribution of opportunity), and that talent is therefore inconsequential.

To test this assumption, we use performance in the training session as a proxy for individual skills in the game. The rationale of our test is the following: if talent were inconsequential for the outcomes, then players with same opportunities should have the same probability to win the game, regardless of their personal skills (proxied by performance in the training). Since all players were trained using the same cards in the 3 rounds and played against a simulated opponent that always received the same hands and played cards using the same rule, performance in the training is comparable across participants.

Operationally, we estimate the probability of winning the game as a function of winning the training session (WT), controlling for individual opportunities (measured by HandStrength; see equation 2), and whether the participants was player 1 or 2. We seek to reject the hypothesis that winners (losers) of the training are systematically more likely to win (lose) the actual card game. Formally, let $Y_i = y_i$ be the random variable that reflects winning ($y_i = 1$) or losing ($y_i = 0$) in the game, such that $\text{P}(Y_i = y_i) \sim \text{Bernoulli}(p_i)$ for $i = 1, 2, \ldots, n$. We estimate p_i with a logistic regression

$$\text{P}(Y_i = 1) = p_i = \text{logit}^{-1}(\alpha + \beta \text{WT}_i + \gamma \text{Player2}_i + \phi \text{HandStrength}_i) \tag{4}$$

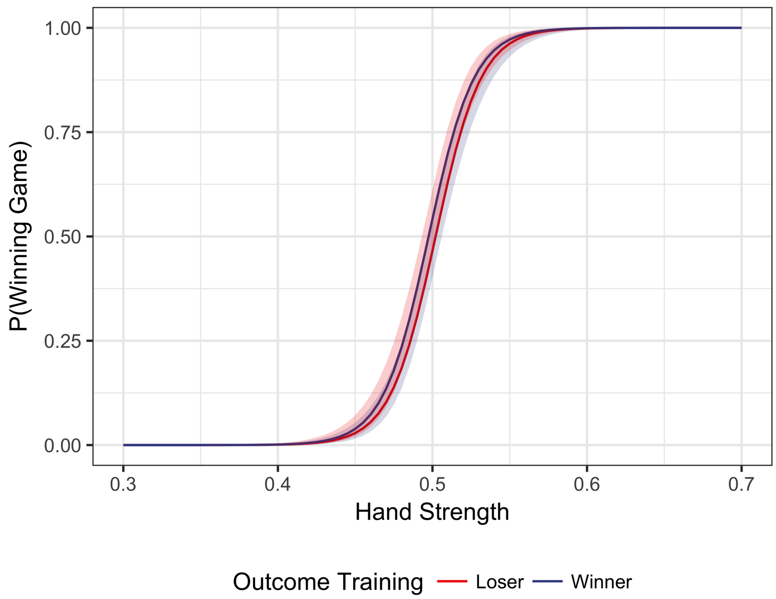

Fig. S3. Predicted probability of winning the game (n = 822). Predicted probabilities are calculated for both winners and losers of the training, at different levels of HandStrength, assuming that all participants are Player 1.5

Figure 3 plots predicted probabilities of winning the game using the estimated parameters from equation 4 (see also table S3, model 1). For the estimation of this model, $N = 822$. The reason our N decreases is due to an unexpected overload of the server that made us lose some information about the card moves for a subset of participants and therefore we could not calculate the hand strength for neither these participants nor their competitors (~ 174) and hence could not calculate equation 2. We only used observations for which we had complete information about their moves, that is, for which we stored all their moves across the 7 rounds. Nonetheless, Chi-Squared tests of independence based on the full sample (i.e. $N = 996$) show that winning the training is statistically independent of winning the game across exchange conditions (results upon request).

Losers of the training session are in red and winners in blue. Semi-transparent areas represent the respective confidence intervals for the predicted probabilities. If individual talent were consequential for winning or losing the game, we should observe significant gaps between blue and red lines. However, as observed in figure S3, winners and losers of the training have the same estimated probability of winning the actual competition at any level of individual hand strength.

These results strongly suggests that individual skills do not play a significant role in our game. Additionally, Chi-Squared tests based on the partial sample (i.e. $N = 822$) also reveals the independence of winning the training and winning the game across exchange conditions (not shown here).

Luck and Redistribution of Opportunity By saying that individual skill does not play a role in our game, we are also claiming that our experimental manipulations control who wins and who loses the game. More specifically, we argue that winning or losing is a function of Hand Strength – determined by both card dealing and card exchange – and player ID (being P1 or P2).

In order to show that this does happen, we perform regression analysis of winning the game on hand strength, player ID, and different natural candidates to capture individual skill. Table S3 displays results for regression analyses. In column 1, we use hand strength and player ID has main predictors of winning the game and add our proxy for skill based on the training session. As already argued in section The Role of Individual Skills, winning or losing the training has no effect on winning the game, while hand strength and player ID have sizable and statistically significant effects. This very simple model (model 1) correctly classifies 80% of observations, with a sensitivity of 80% for the true positive rate and a specificity of 80% for the true false rate.

Table S3. Logistic regression on winning the Swap Game.

	Winner of the Game		
	(1)	(2)	(3)
Intercept	−33.2*** (2.9)	−34.8*** (3.5)	−34.9*** (3.5)
Player 2	−1.6*** (0.2)	−1.6*** (0.2)	−1.6*** (0.2)
Hand Strength	67.7*** (5.9)	68.4*** (6.0)	69.0*** (6.1)
Winner Training	0.3 (0.2)	0.3 (0.2)	0.3 (0.2)
High School		1.0 (1.6)	1.0 (1.7)
Some College		1.3 (1.6)	1.3 (1.7)
College		1.2 (1.6)	1.2 (1.7)
Grad/Prof.		1.1 (1.6)	1.1 (1.7)
$25k-$50k		−0.04 (0.3)	−0.02 (0.3)
$50k-$75k		0.1 (0.3)	0.1 (0.3)
$75k+		0.2 (0.3)	0.2 (0.3)
Age			−0.00 (0.01)
Male			−0.1 (0.2)
Other			−0.5 (0.4)
Black			−0.4 (0.4)
Latino/a			0.5 (0.5)
Observations	822	818	816
AIC	658.9	667.2	672.8

Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors in parentheses. Reference categories for dependent variables are unfair in (1) and luck in (2) and (3). RA is the reference for exchange conditions.

Furthermore, the residual error that induces misclassification in model 1 is not correlated with natural candidates of unobserved skills not captured by the training performance, such as education and income. The other models in table S3 include measures for education and income (model 2) and for age, gender, and race (model 3). However, all these socio-demographic variables have very large standard errors and do not improve the predictive accuracy of model 1, as informed by AIC.

All these results strongly suggest that talent is inconsequential for the main outcomes and that our experimental manipulations mostly control who wins and who loses the game.

The Player ID effect Once participants are paired, they are randomly assigned to a player ID: player 1 (P1) or player 2 (P2). Being P1 confers an additional, structural advantage in the game, since P1 is the first mover at the beginning of every round, regardless of the outcome of previous rounds. Therefore, player ID remains always the same across rounds.

Table S4. Proportion of winners by player ID.

	Player ID		
Exchange Conditions	**P1**	**P2**	**P1−P2**
RA1	0.59	0.41	0.09
PR1	0.65	0.35	0.15
RE1	0.65	0.35	0.15
RA2	0.63	0.37	0.13
PR2	0.67	0.33	0.17
RE2	0.47	0.53	−0.03

Since the 1st round involves no card exchange, the P1 advantage is the same for all types of exchange. And this structural advantage is more noticeable when P1 and P2 are dealt similar cards. In the baseline conditions (RA1 and RA2), every round is completely independent from the previous one, so being P1 confers the same type of structural advantage in each round. Table S4 shows that this effect is considerable in this pure-luck situation: 60% of winners being P1 relative to 40% of winners being P2, on average.

In both the PR and RE exchange conditions, the P1 advantage has the same effect. Since P1 and P2 are randomly assigned at the beginning of the game, player ID is independent of the exchange rules and therefore the P1 advantage operates similarly across conditions, only in the 1st round. In the conditions with higher levels of redistribution (2-card exchange), winning the 1st round gives a critical advantage because both the PR and RE exchange rules almost completely govern the game process (see figure S2). Being P1 then gives players an additional advantage to win the first round and therefore the game. In the 1-card exchange conditions, the dependence of winning on the exchange rules is minimized, but not completely ruled out. In any case, the P1 advantage interacts with the hand strength in every round and therefore the relationship between winning the game and being P1 is far from perfect.

Table S4 shows the empirical distribution of winners in the game by player ID and exchange condition. These results reveal two critical aspects for our analyses. First, being player 1 reveals a clear positive association with winning the game. And second, this player ID effect works always in the same way, except for the 2-card regressive exchange where P1 and P2 players win the game at the same rate. However, these partial results are purely descriptive and do not reveal the net effect of the player ID. Table S3 (model 1) shows the effect of player ID on winning the game net of hand strength, which is negative and statistically significant (with P1 as the reference category).

Even though the P1 advantage works in the same way across exchange conditions, it is still possible that players perceived this advantage differently. Indeed, winning the 1st round in the RE condition most likely leads to winning most of the other rounds, while winning the 1st round in the PR condition most likely leads to losing about half of the rounds. Given this interaction between player ID and exchange rules, we replicate our main results decomposed by player ID to ensure that our findings are not driven by personal responses to being assigned to P1 or P2.

Since P1 players win the game at a higher rate than P2 players (see table S4), we apply an inverse probability weighting procedure to obtain a balance sample of winners and losers within the subsample of P1 and P2 players. Equation 5 describes the construction of these weights

$$w_{ij} = \begin{cases} \frac{1}{\hat{p_{ij}}} & \text{if player i is a winner in condition } j \\ \frac{1}{1-\hat{p_{ij}}} & \text{if player i is a loser in condition } j \end{cases} \tag{5}$$

where $\hat{p_{ij}}$ is the estimated probability of winning the game in condition j as a function player ID (being P1 or P2). We estimate $\hat{p_{ij}}$ with a logistic regression.

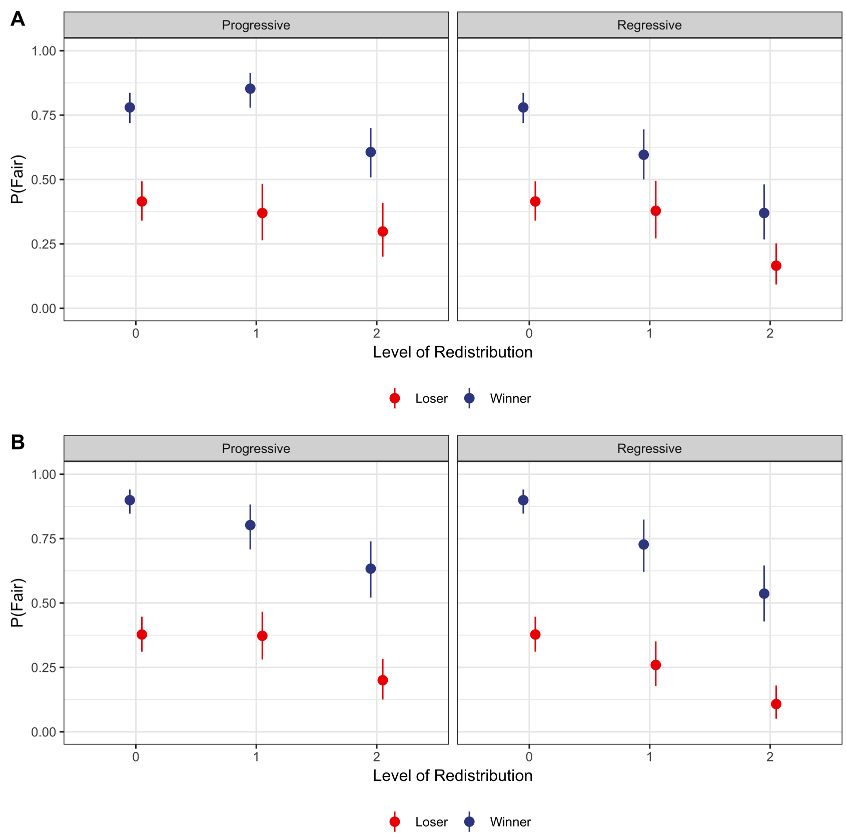

Fig. S4. Proportions of normative responses by exchange condition, level of redistribution (0 = random, one-card, and two-card exchange), and outcome as winner (blue) or loser (red).

Panel A shows results for P1 players and panel B results for P2 players. Both figures show proportions of normative by exchange condition, level of redistribution (0=Random, 1-card, and 2-card exchange), and outcome as winner (blue) or loser (red). Random exchange (RA) involves zero redistribution and is identical in each panel (indicated by 0 on the X-axis). Proportions are estimates from Bayesian logistic regression with uninformative priors. Bars are 95% credible intervals with N= 498.

In our Bayesian estimation framework, we implement the inverse probability weighting by multiplying the log-posterior likelihood of each observation with its respective weight w_{ij}. Figures

S4-S6 display our results. When compared with results from figures 1 and 2, we find that P1/P2 responses are similar to our main results.

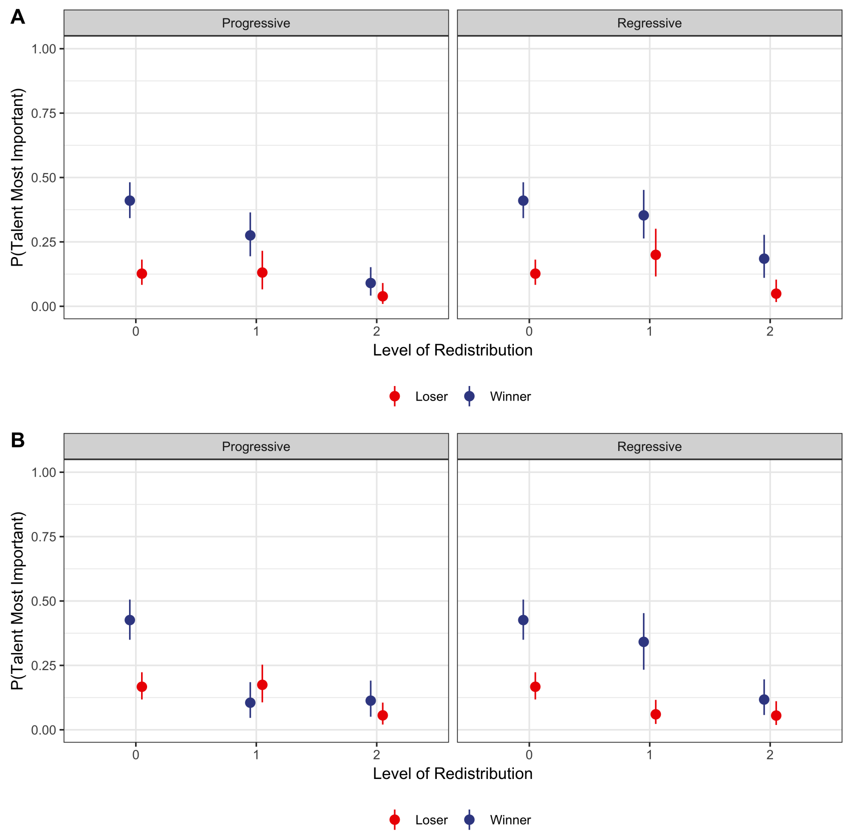

Fig. S5. Proportions of talent responses as the most important factor by exchange condition, level of redistribution (0 = random, one-card, and two-card exchange), and outcome as winner (blue) or loser (red). Panel A shows results for P1 players and panel B results for P2 players. Both figures show proportions of players who mentioned talent as the most important factor that explains the game outcomes. Results are separated by exchange condition, level of redistribution (0=Random, 1-card, and 2-card exchange), and outcome as winner (blue) or loser (red). Random exchange (RA) involves zero redistribution and is identical in each panel (indicated by 0 on the X-axis). Proportions are estimates from Bayesian logistic regression with uninformative priors. Bars are 95% credible intervals with N= 498.

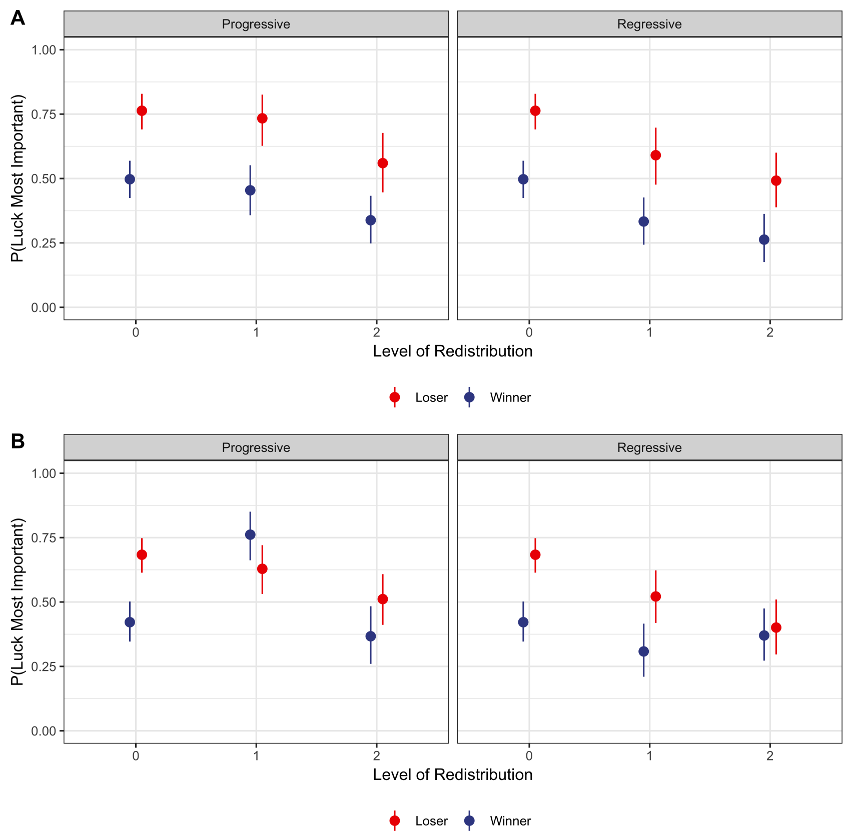

Fig. S6. Proportions of luck responses as the most important factor by exchange condition, level of redistribution (0 = random, one-card, and two-card exchange), and outcome as winner (blue) or loser (red). Panel A shows results for P1 players and panel B results for P2 players. Both figures show proportions of players who mentioned luck as the most important factor that explains the game outcomes. Results are separated by exchange condition, level of redistribution (0=Random, 1-card, and 2-card exchange), and outcome as winner (blue) or loser (red). Random exchange (RA) involves zero redistribution and is identical in each panel (indicated by 0 on the X-axis). Proportions are estimates from Bayesian logistic regression with uninformative priors. Bars are 95% credible intervals with N= 498.

Results for Rules of the Game Figure S7 shows results for the category of rules of the game omitted in figure 2 in the main text. It reveals that as the redistribution of opportunity becomes more consequential for economic inequality, participants become more aware that the rules of the game are the most important factor to explain unequal outcomes.

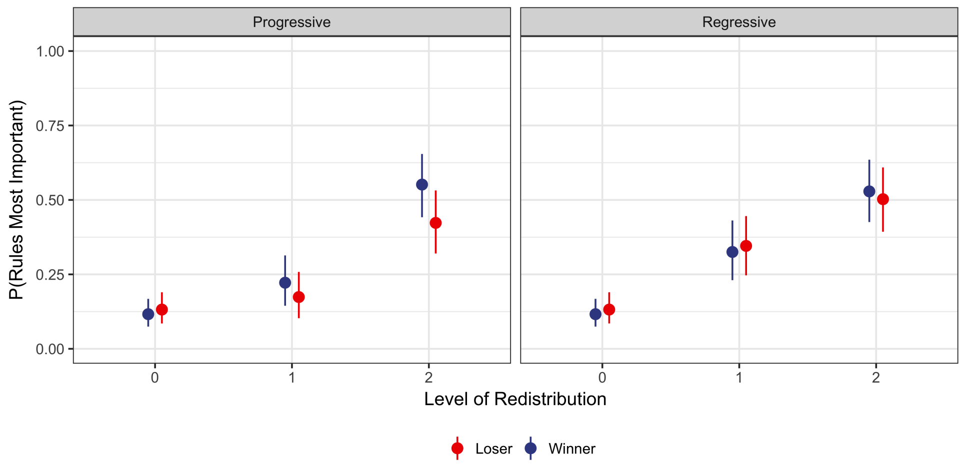

Fig. S7. Proportions of rules of the game responses as the most important factor by exchange condition, level of redistribution (0 = random, one-card, and two-card exchange), and outcome as winner (blue) or loser (red). Panel A shows proportions for rules of the game as the most important factor. Proportions are estimates from a Bayesian logistic regression with uninformative priors. Bars are 95% credible intervals. $N = 996$.

Baseline Exchange Conditions Figure S8 shows the difference between the one- and two-card exchanges for the baseline condition (RA). In the main text, these two conditions were combined because the number of cards exchanged in the random conditions works only as a placebo for the players, without really altering the distribution of opportunity (see figure 2). Panels A-C and D-F show the comparison between the two random conditions (RA1 for the one-card exchange and RA2 for the two-card exchange) for cognitive beliefs for the most and least important factors, respectively. Panel J displays results for normative responses. And panels G-I show emotional reactions.

In most cases, there are no significant differences between exchanging one card or two cards in the random condition. However, an exception to this is the case of perceived rules as the *least* important factor (panel F) and emotional indifference about the outcomes (panel I). This suggests that exchanging two cards in the random conditions, although objectively inconsequential for the outcomes as redistributive mechanisms, could have had a subjective effect on beliefs of inequality.

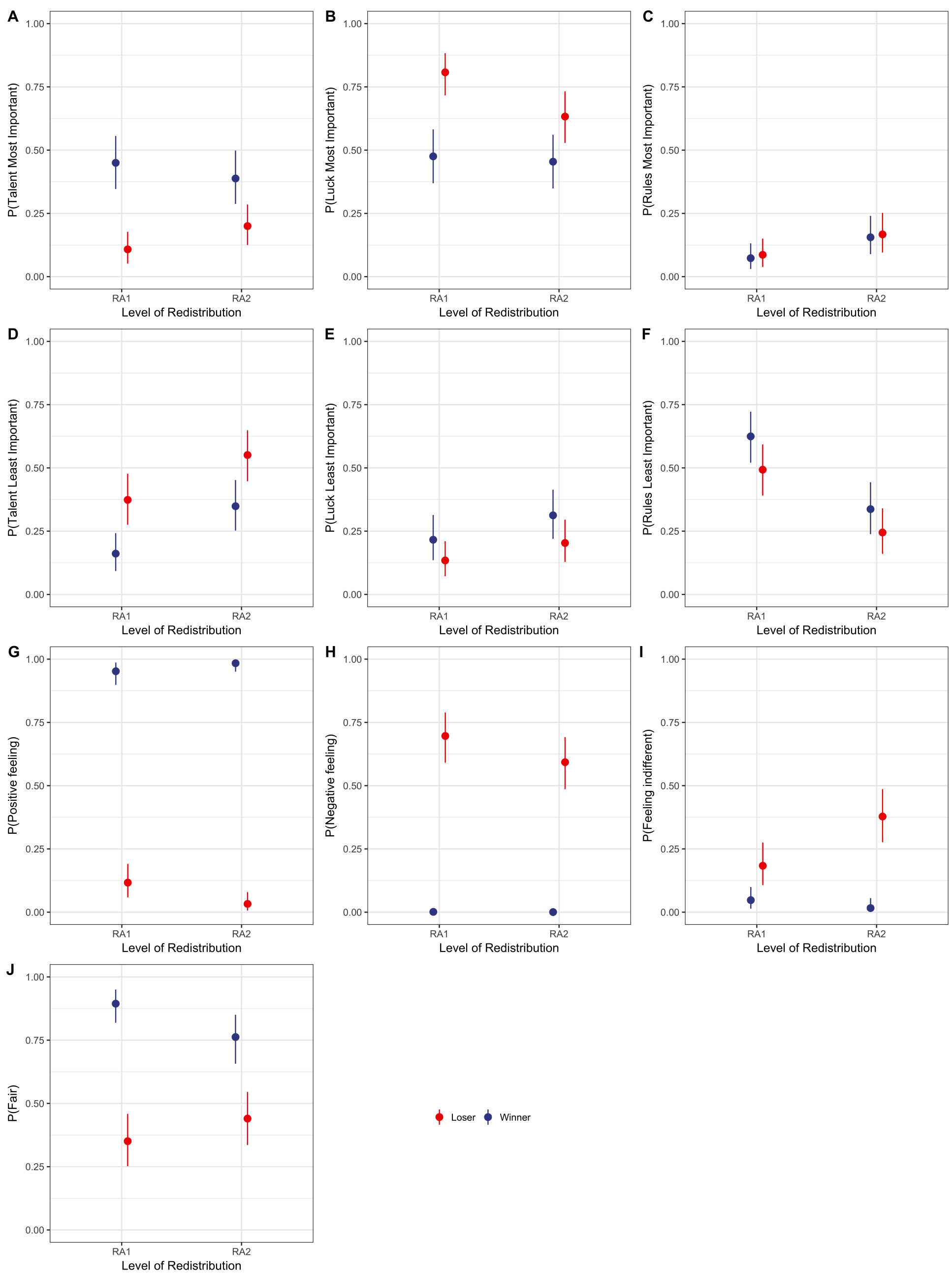

Fig. S8. Decomposition of the one-card and two-card RA exchange conditions. Panels A-C and D-F show proportions for cognitive beliefs (most important and least important, respectively). Panel J shows proportions for normative responses. And panels G-I show results for affective responses. Proportions are estimates from a Bayesian logistic regression with uninformative priors. Bars are 95% credible intervals. $N = 996$.

Credible and Confidence Intervals In this section, we report detailed analyses supporting the findings described in the main text (Figures 1, 2 and 3). Tables S5 to S7 report estimated proportions for cognitive, normative and affective responses by winning status and exchange condition. Uncertainty around these estimates is reported via frequentist confidence intervals (columns 5 and 6) as well as Bayesian credible intervals (columns 7 and 8). In the first case, we estimate the confidence interval for a parameter p (the proportion of individual holding each response) using the normal approximations of the Bernoulli distribution. Formally

$$95\%\ \text{CI} = \hat{p} \pm 1.98\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \tag{6}$$

In the second case, we estimate the 95% credible interval for the parameter p via Bayesian logistic regression. The probability of holding each type of response is modeled as a function of the interaction between winning status and exchange conditions. Formally

$$\begin{aligned}
y_i &\sim Bernoulli(p_i) \\
p_i &= logit^{-1}(\boldsymbol{X_i'\beta}) \\
\alpha &\sim Cauchy(0, 10) \\
\boldsymbol{\beta} &\sim Cauchy(\mathbf{0}, \mathbf{2.5})
\end{aligned} \tag{7}$$

where α is the model's intercept, $\boldsymbol{X}$ is the design matrix for the interaction between winning status and exchange conditions and $\boldsymbol{\beta}$ are the corresponding coefficients. We chose weakly informative priors for these coefficients following Gelman et al (*37*). The credible interval is calculated from the 95% quantile interval from the posterior distribution of p. Estimation uses the software `Stan` in `R`.

The results strongly indicate that statistical inference around our finding is robust to different estimation methods.

Table S5. Proportion of respondent that evaluate the results of the game as fair.

Fairness	Regime	Winner/Loser	%	LL	UL	LL	UL
				95% Confidence Interval		95% Credible Interval	
Fair	RA	Loser	0.39	0.32	0.47	0.33	0.46
Fair	PR1	Loser	0.37	0.27	0.48	0.28	0.47
Fair	PR2	Loser	0.23	0.14	0.32	0.15	0.33
Fair	RE1	Loser	0.3	0.2	0.4	0.21	0.40
Fair	RE2	Loser	0.14	0.06	0.21	0.07	0.22
Fair	RA	Winner	0.83	0.77	0.89	0.77	0.88
Fair	PR1	Winner	0.84	0.76	0.91	0.75	0.90
Fair	PR2	Winner	0.61	0.51	0.72	0.51	0.72
Fair	RE1	Winner	0.64	0.53	0.74	0.53	0.74
Fair	RE2	Winner	0.46	0.35	0.57	0.35	0.56

Table S6. Proportion of respondents that mention luck/talent/rules as the most important factor to explain the results of the game.

			%	95% Confidence Interval		95% Credible Interval	
Most Important	Regime	Winner/Loser		LL	UL	LL	UL
Luck	RA	Loser	0.72	0.65	0.79	0.64	0.78
Luck	PR1	Loser	0.66	0.56	0.76	0.56	0.76
Luck	PR2	Loser	0.52	0.42	0.63	0.42	0.63
Luck	RE1	Loser	0.54	0.43	0.65	0.44	0.65
Luck	RE2	Loser	0.44	0.34	0.55	0.34	0.56
Luck	RA	Winner	0.46	0.39	0.54	0.39	0.55
Luck	PR1	Winner	0.56	0.46	0.67	0.46	0.67
Luck	PR2	Winner	0.35	0.25	0.45	0.25	0.45
Luck	RE1	Winner	0.33	0.22	0.43	0.23	0.43
Luck	RE2	Winner	0.32	0.22	0.42	0.23	0.42
Talent	RA	Loser	0.15	0.1	0.21	0.10	0.21
Talent	PR1	Loser	0.16	0.08	0.24	0.10	0.24
Talent	PR2	Loser	0.05	0	0.1	0.01	0.10
Talent	RE1	Loser	0.11	0.04	0.18	0.06	0.18
Talent	RE2	Loser	0.05	0	0.1	0.02	0.11
Talent	RA	Winner	0.42	0.35	0.5	0.34	0.49
Talent	PR1	Winner	0.21	0.12	0.3	0.13	0.30
Talent	PR2	Winner	0.1	0.03	0.16	0.04	0.17
Talent	RE1	Winner	0.35	0.25	0.45	0.25	0.45
Talent	RE2	Winner	0.15	0.07	0.23	0.08	0.23
Rules	RA	Loser	0.13	0.08	0.18	0.09	0.18
Rules	PR1	Loser	0.17	0.09	0.26	0.10	0.25
Rules	PR2	Loser	0.43	0.32	0.53	0.32	0.54
Rules	RE1	Loser	0.35	0.25	0.45	0.25	0.45
Rules	RE2	Loser	0.51	0.4	0.62	0.39	0.61
Rules	RA	Winner	0.11	0.07	0.16	0.07	0.17
Rules	PR1	Winner	0.22	0.13	0.31	0.14	0.31
Rules	PR2	Winner	0.55	0.45	0.66	0.44	0.65
Rules	RE1	Winner	0.33	0.22	0.43	0.23	0.43
Rules	RE2	Winner	0.53	0.42	0.64	0.42	0.64

Table S7. Proportion of respondents that mention positive/negative/indifferent feelings about his/her results in the game.

			%	95% Confidence Interval		95% Credible Interval	
Feelings	Regime	Winner/Loser		LL	UL	LL	UL
Positive	RA	Loser	0.07	0.03	0.11	0.04	0.11
Positive	PR1	Loser	0.05	0	0.09	0.01	0.10
Positive	PR2	Loser	0.05	0	0.1	0.02	0.11
Positive	RE1	Loser	0.05	0	0.09	0.02	0.10
Positive	RE2	Loser	0.02	0*	0.06	0.01	0.07
Positive	RA	Winner	0.97	0.94	1	0.94	0.99
Positive	PR1	Winner	0.96	0.93	1	0.92	0.99
Positive	PR2	Winner	0.96	0.92	1	0.92	0.99
Positive	RE1	Winner	0.98	0.94	1*	0.93	1.00
Positive	RE2	Winner	0.95	0.9	1	0.89	0.98
Negative	RA	Loser	0.64	0.57	0.72	0.57	0.72
Negative	PR1	Loser	0.56	0.45	0.66	0.45	0.66
Negative	PR2	Loser	0.62	0.52	0.73	0.52	0.72
Negative	RE1	Loser	0.7	0.6	0.8	0.59	0.79
Negative	RE2	Loser	0.78	0.69	0.87	0.68	0.86
Negative	RA	Winner	0	0	0	0.00	0.01
Negative	PR1	Winner	0	0	0	0.00	0.01
Negative	PR2	Winner	0.01	0*	0.04	0.00	0.04
Negative	RE1	Winner	0	0	0	0.00	0.01
Negative	RE2	Winner	0.01	0*	0.04	0.00	0.04
Indifferent	RA	Loser	0.28	0.21	0.35	0.22	0.35
Indifferent	PR1	Loser	0.4	0.29	0.5	0.30	0.49
Indifferent	PR2	Loser	0.33	0.23	0.43	0.23	0.43
Indifferent	RE1	Loser	0.25	0.16	0.35	0.16	0.35
Indifferent	RE2	Loser	0.2	0.11	0.29	0.12	0.29
Indifferent	RA	Winner	0.03	0	0.06	0.01	0.06
Indifferent	PR1	Winner	0.04	0	0.07	0.01	0.08
Indifferent	PR2	Winner	0.02	0*	0.06	0.00	0.07
Indifferent	RE1	Winner	0.02	0*	0.06	0.00	0.06
Indifferent	RE2	Winner	0.04	0	0.08	0.01	0.09

* Values marginally exceeded the [0,1] thresholds for proportions. In the cases with value 0 for the lower limit of the confidence interval, the normal approximation yielded an estimate of -0.01. In the case with value 1 in the upper limit the normal approximation yielded an estimate of 1.01.

Additional Results We test whether our main results are robust to statistical control for several socio-demographic variables via regression analysis. We found that only gender has a strong and statistically significant association with our dependent variables: males are generally more inclined than females to perceive economic inequality as unfair and less inclined than females to perceive talent as the most important factor, relative to luck. The effects of our experimental manipulations remain, however, unchanged (results available upon request).

Furthermore, we present a plot with proportions for the least important factor to explain unequal outcomes. Figure S9 shows proportions for the least important factor by exchange condition, being a winner or a loser, and the numbers of cards swapped. Similar to plots in the main text, the baseline condition combines one-card and two-card exchange conditions.

These findings provide a robustness check for our main results (figure 1). In fact, we find opposite patterns with respect to what we observe in the main text (panels A and B, figure 1). For instance, in panel B of figure 1, luck is generally highly mentioned as the most important factor for unequal outcomes across exchange conditions -between 40% and 60% of the times across conditions. Correspondingly, luck is not generally mentioned as the least important factor across exchange conditions in panel B of figure S9. In fact, it is overall pointed as the least important factor between 20% and 30% of the times.

Similarly, when talent is generally not very likely to be selected as the most important factor (panel A, figure 1), it is consistently very likely to be mentioned as the least important factor (panel A, figure S9). Besides, the few differences that we observe in figure 1 between winners and losers in selecting the most important factor, specifically in the baseline condition and the one-card exchange condition, are also observed in choosing the least important factor but in the opposite way: losers perceive talent as the least important factor more than winners (panel A, figure S9).

Overall, these results show high overall consistency for individual responses and provide strong additional support for our main conclusions in the main text.

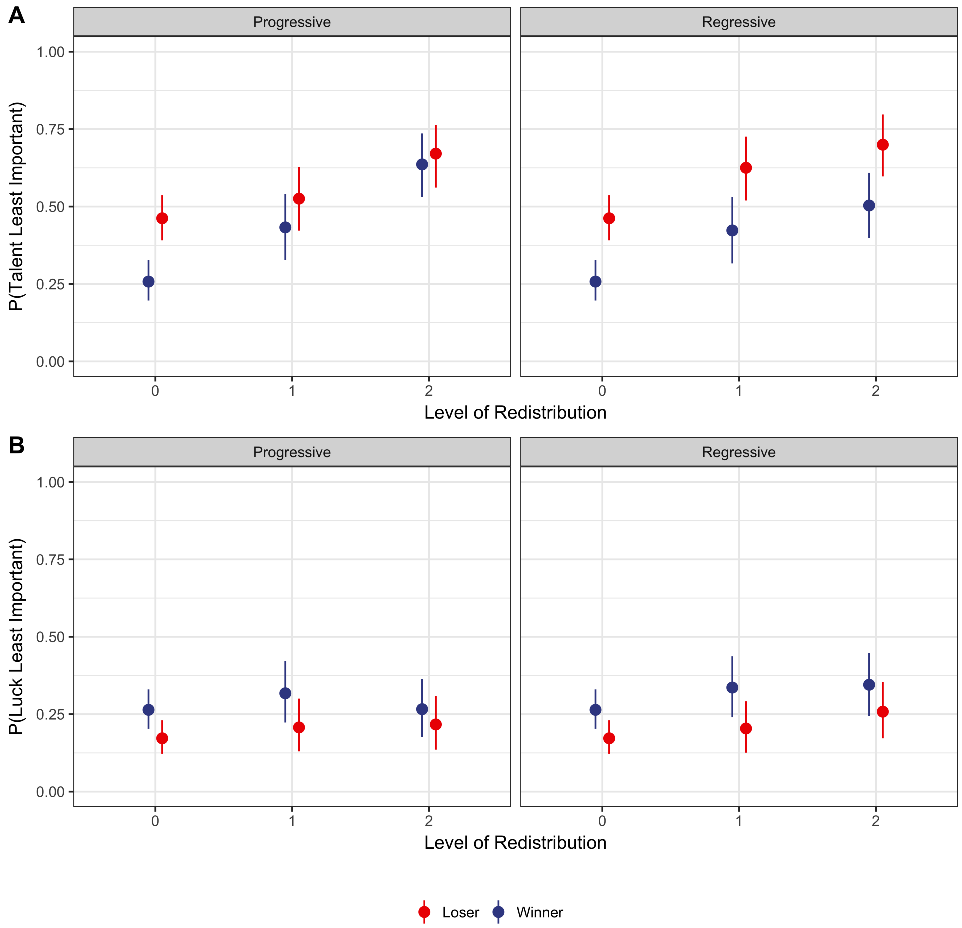

Fig. S9. Proportions of the least important factor by winning status, exchange condition, and intensity of redistribution. Proportions are estimates a from Bayesian logistic regression with uninformative priors. Bars are 95% credible intervals. The baseline condition ($= 0$) is repeated twice. $N = 996$.

Sample Characteristics Table S8 displays sociodemographic characteristics of our participants. As we can observe, the typical participant was about 35 years old and has a political orientation slightly to the left. The distribution of participants in terms of gender and income is fairly balanced. But this is not observed with race, religion, and education. Most of our participants were white, did not identify with any religion, and were highly educated.

Table S8. Sociodemographic characteristics.

Variables	Mean/Pct.	Sd	Min	Max
Age	37.3	11.4	19	87
Political Identification	4.2	2.4	1	9
Gender				
Female	50.9			
Male	49			
Other	0.1			
Race				
White	80.8			
Black	7.2			
Asian	5.3			
Latino	5.3			
American Indian	0.4			
Other	0.9			
Religion				
None	47.7			
Protestant	23.6			
Catholic	15.3			
Jewish	1.6			
Lutheran	1.7			
Muslim	0.6			
Other	9.4			
Education				
Graduate/Professional Degree	10			
College Degree	44.7			
Some College	31.1			
High School	13.7			
Less than High School	0.5			
Household Income				
$0-$25,000	24.9			
$25,000-$50,000	31.8			
$50,000-$75,000	24.6			
+$75,000	18.8			

Table S9 shows the balance of demographic characteristics across exchange conditions. We excluded categories with only a few observations (e.g. Lutherans in Religion or American Indians in Race). As observed, participants are not perfectly balanced across conditions but there are no participants with a specific profile clustered in a particular condition.

Table S9. Sociodemographic characteristics by exchange condition.

	PR1	PR2	RA1	RA2	RE1	RE2
Age	38.03	36.47	37.94	37.02	37.08	37.46
Political Identification	4.37	4.07	4.31	3.84	3.99	4.46
Female	0.5	0.52	0.53	0.46	0.58	0.47
Catholic	0.15	0.15	0.15	0.17	0.13	0.17
Protestant	0.25	0.22	0.22	0.25	0.25	0.23
No religion	0.51	0.49	0.53	0.47	0.47	0.39
White	0.82	0.85	0.8	0.77	0.73	0.87
Income \$0-\$25,000	0.19	0.22	0.27	0.31	0.19	0.31
Income \$25,000-\$50,000	0.35	0.32	0.37	0.3	0.33	0.24
Income \$50,000-\$75,000	0.26	0.24	0.21	0.24	0.29	0.24
Income +\$75,000	0.19	0.23	0.15	0.15	0.19	0.21
College or more	0.51	0.58	0.53	0.55	0.57	0.55
Some college	0.32	0.26	0.31	0.35	0.31	0.31
HS or less	0.17	0.17	0.17	0.10	0.12	0.13