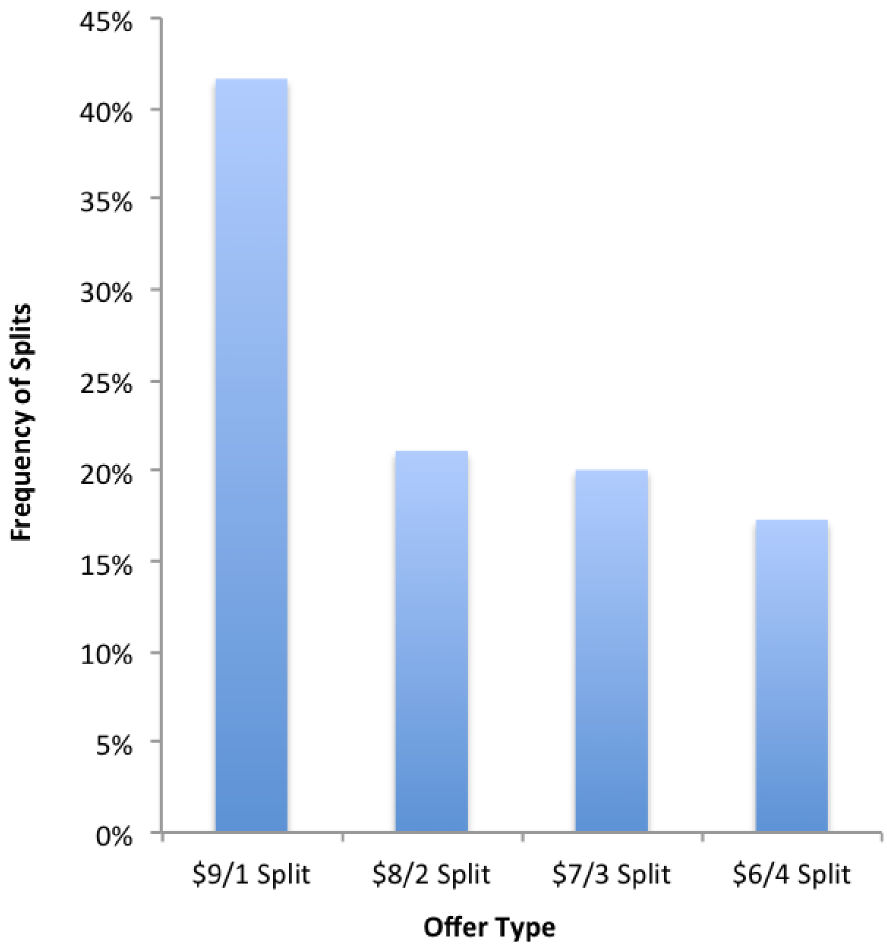
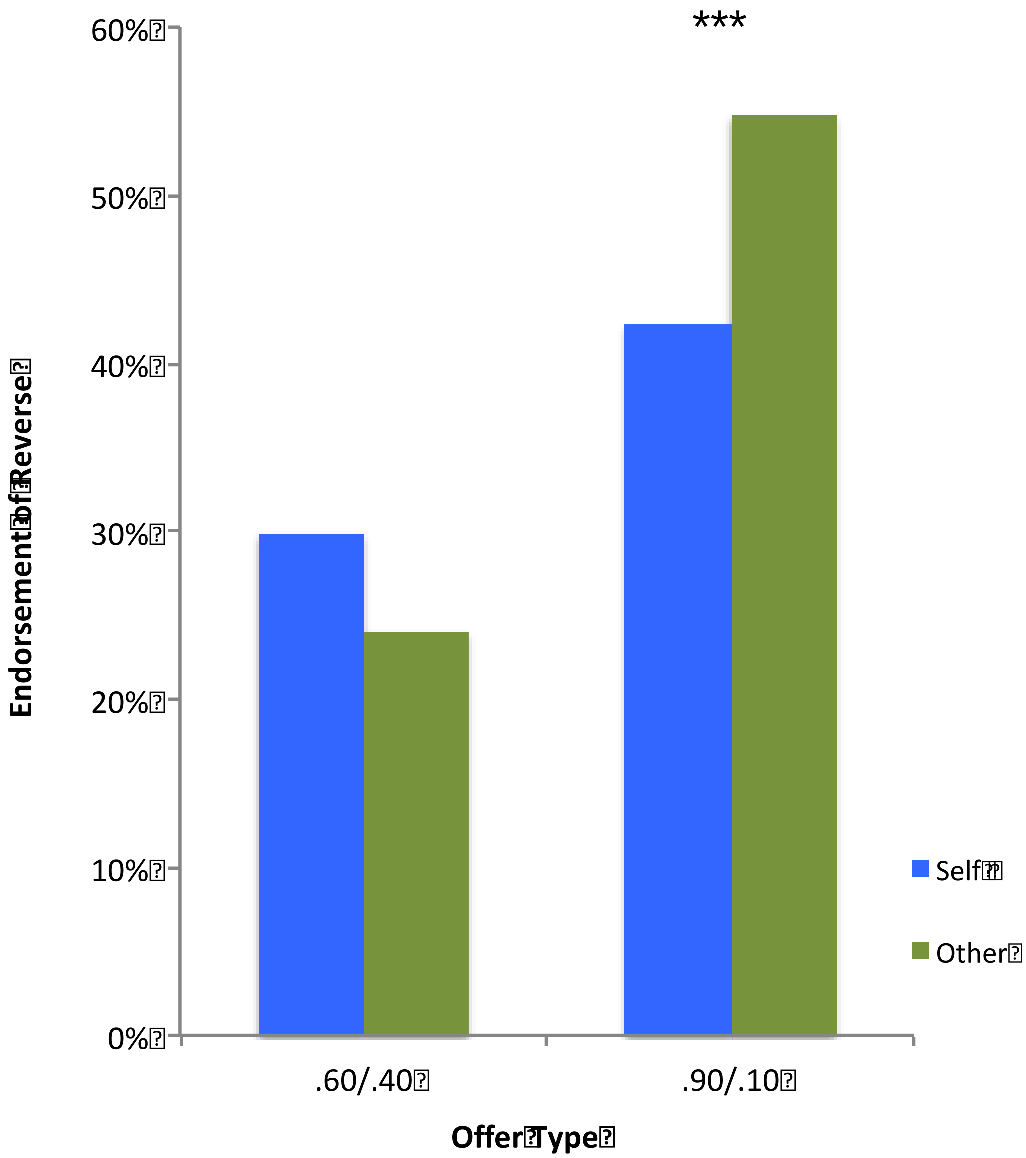
SUPPLEMENTARY MATERIALS

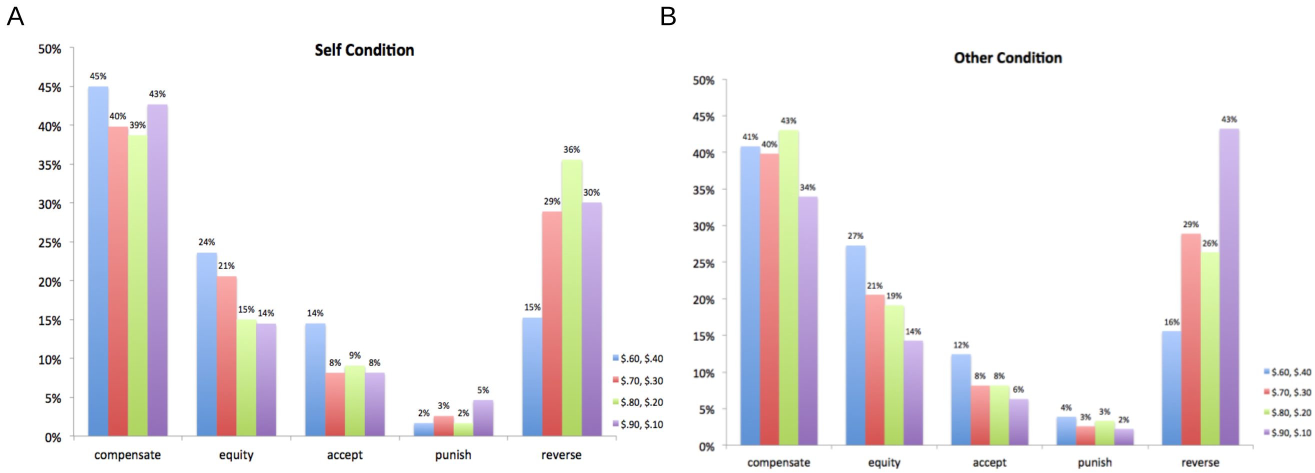
SUPPLEMENTARY FIGURES



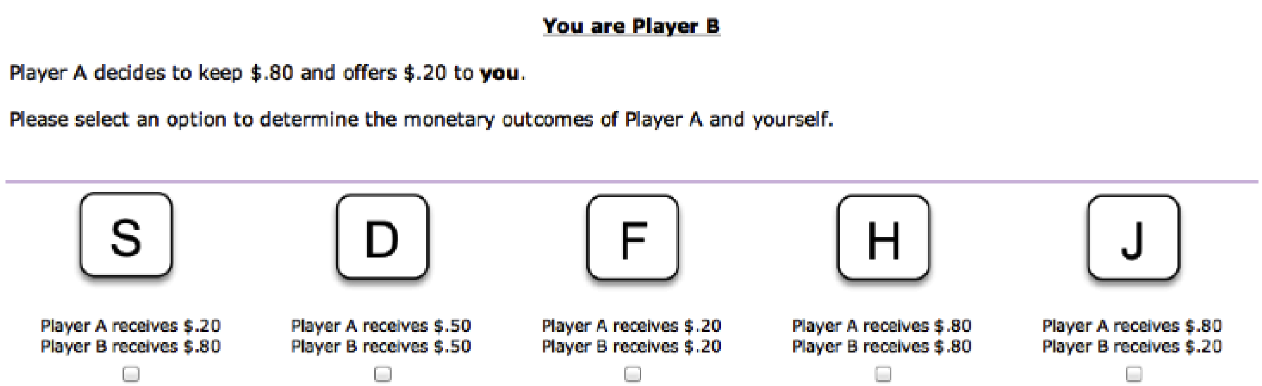
Supplementary Figure 1 | Frequency of unfair splits from Player A in Experiment 1. Player As made highly unfair offers of ($9/$1) 42% of the time.



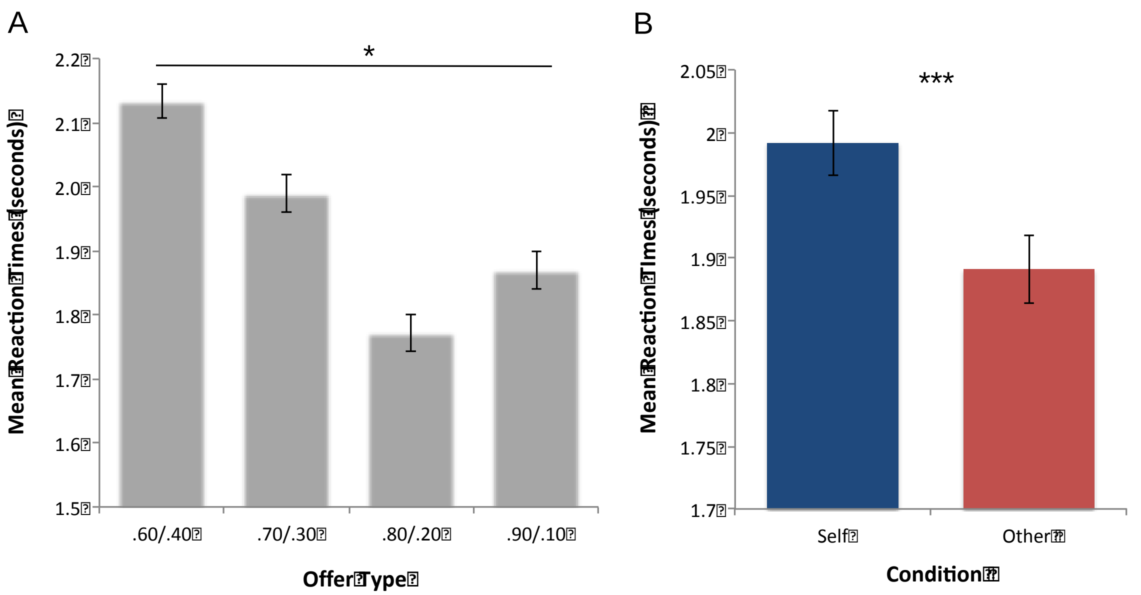
Supplementary Figure 2 | Choice Behavior for Experiment 2. Endorsement rates of each option paired with all possible other options in the Self condition (Experiment 2a) and Other condition (Experiment 2b).



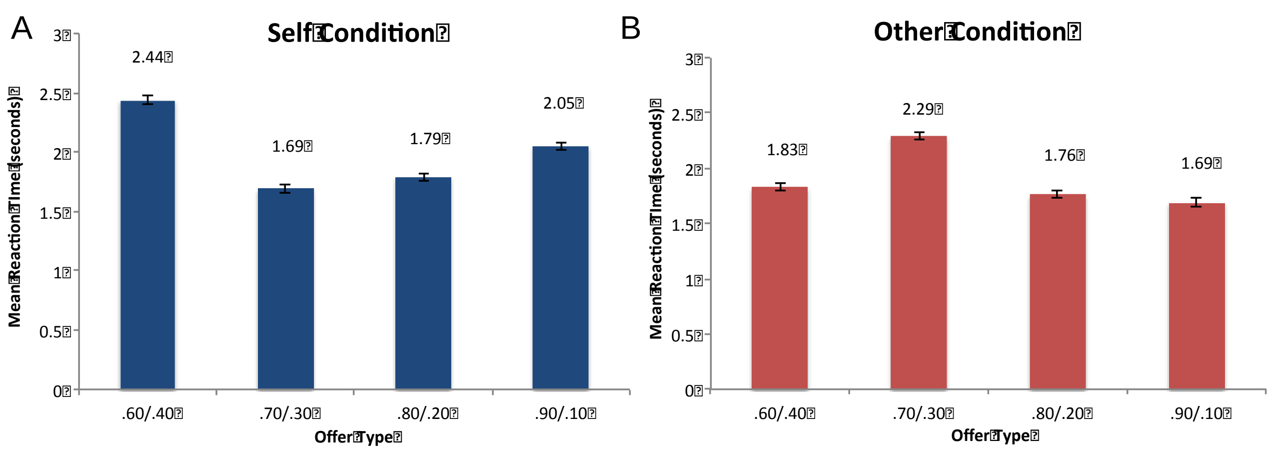
Supplementary Figure 3 | Choice Behavior for Experiments 3-6. A) Endorsement rates of each option in the Self condition, illustrating that regardless of the offer type, participants prefer to compensate and not punish. **B).** Endorsement rates of each option in the Other condition, illustrating that when the offer becomes unfair, participants significantly prefer to reverse the payouts on behalf of another.



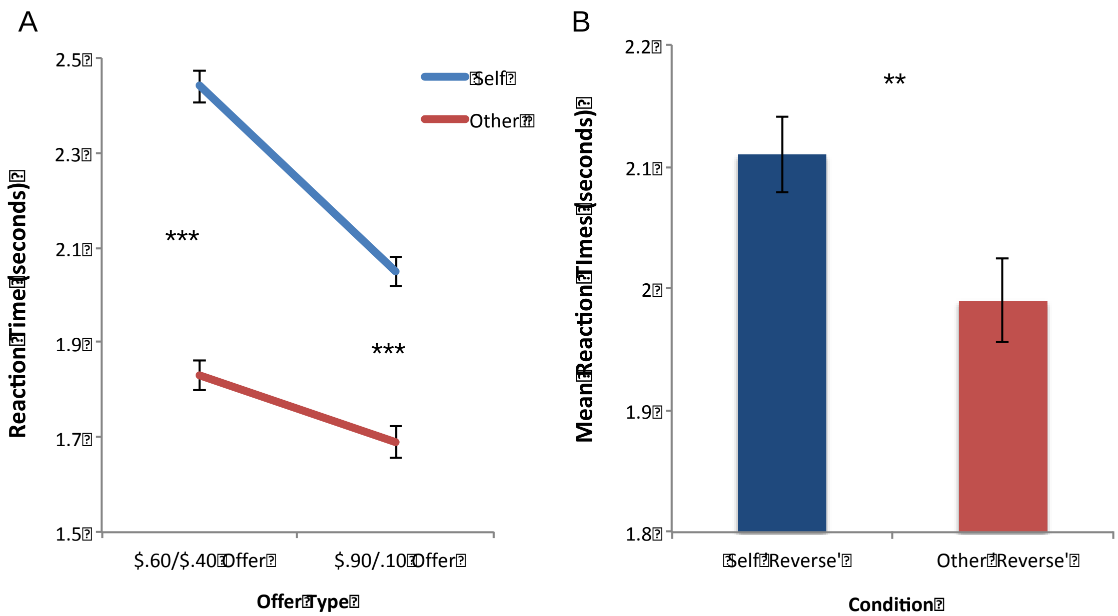
Supplementary Figure 4 | Example Trial. Visual of a trial in the Self condition where Player A offers an $0.80/$0.20 split to Player B. By pressing one of the five buttons, participants were able to determine the monetary outcomes for themselves and Player A.



Supplementary Figure 5 | Reaction Times by Offer Type. A) Reaction time responses (regardless of what the endorsed option) for each offer type, conditions collapsed. **B)** Reaction times for all response types in 'Self' and 'Other' conditions, all offer types collapsed. ***p<0.001, *p<0.05. Error bars represent 1 SEM.



Supplementary Figure 6 | Reaction Time by Condition. A) Reaction times in Self Condition**. B)** Reaction times in Other Condition. Error bars represent 1 SEM.



Supplementary Figure 7 | Reaction Times. A) Mean reaction times by condition and offer type ($.60, $.40 and $.90, $.10) illustrate that participants make significantly faster, more retributive decisions for another when the offer is unfair, compared to the slower, more prosocial choices made for the self. Error bars indicate one standard error of the mean. **B)** Mean reaction times for the option to 'reverse' reveal that participants are significantly slower to be retributive when deciding for themselves compared to when deciding on behalf of another. ***p<0.001 ** p<0.01

SUPPLEMENTARY TABLES

$9/1 Split	COMPENSATE	EQUITY	ACCEPT	PUNISH	REVERSE	TOTAL
compensate		99%	99%	100%	65%	91%
equity	1%		99%	100%	21%	55%
accept	1%	1%		37%	2%	10%
punish	0%	0%	63%		0%	16%
reverse	35%	79%	98%	100%		78%
						Total Trials: 1052
$8/2 Split	**compensate**	**equity**	**accept**	**punish**	**reverse**	**Total**
compensate		100%	100%	100%	53%	88%
equity	0%		97%	100%	20%	54%
accept	0%	3%		33%	0%	9%
punish	0%	0%	67%		0%	17%
reverse	47%	80%	100%	100%		82%
						Total Trials: 532
$7/3 Split	**compensate**	**equity**	**accept**	**punish**	**reverse**	**Total**
compensate		100%	100%	100%	75%	94%
equity	0%		100%	100%	4%	51%
accept	0%	0%		28%	2%	8%
punish	0%	0%	72%		0%	18%
reverse	25%	96%	98%	100%		80%
						Total Trials: 506
$6/4 Split	**compensate**	**equity**	**accept**	**punish**	**reverse**	**Total**
compensate		100%	100%	100%	82%	96%
equity	0%		97%	100%	24%	55%
accept	0%	3%		45%	0%	12%
punish	0%	0%	55%		0%	14%
reverse	18%	76%	100%	100%		74%
						Total Trials: 436

Supplementary Table 1 | Endorsement rates of each option when paired with every possible pairwise option. Endorsement of each option is designated on the left (Y axis) and paired with every possibility on the right (X axis).

A

SELF	$.60/.40	$.70/.30	$.80/.20	$.90/.10	TOTAL
Compensate	86%	84%	85%	82%	84%
Equity	66%	64%	63%	63%	64%
Accept	11%	11%	10%	9%	10%
Punish	26%	29%	28%	27%	27%
Reverse	61%	62%	64%	69%	64%

B

OTHER	$.60/.40	$.70/.30	$.80/.20	$.90/.10	TOTAL
Compensate	70%	63%	61%	59%	63%
Equity	71%	73%	73%	72%	72%
Accept	23%	15%	12%	11%	15%
Punish	43%	45%	44%	43%	44%
Reverse	42%	55%	60%	64%	55%

Supplementary Table 2 | Endorsement rates of each option paired with all possible other options. A). Self condition (Experiment 2a) and **B)**. Other condition (Experiment 2b).

SUPPLEMENTARY DISCUSSION

Motivations for Restoring Justice

According to rational choice theory[1], individuals are motivated by material self-interest, always optimizing the expected utility of options when making decisions[2]. Yet decades of work exploring how people respond to fairness violations suggest that there are strong motivational forces that drive deviations from economic self-interest[3]. Such departures from self-interest have inspired models of social preferences, such as reciprocal fairness, where players are assumed to positively value kind intentions, and to negatively value hostile intentions[3]. For example, if player A reduces B's payoff to his own benefit, a reciprocal player B will punish A, whereas if the reduction of player B's payoff was a result of a unintentional redistribution, player B will not punish A[4]. Alternatively, if a player is motivated by inequity aversion, or the dislike of unequal outcomes[3], then player B will take action to redistribute income[5].

In these classic decision-making games, motives of punishment, inequality aversion, and cooperation are pitted against a singular other motive. In an attempt to understand whether punishment and compensation are psychologically similar approaches to restoring justice, we have devised a novel economic game in which participants have multiple options for restoring justice, each of which harnesses a different motivation. Below we explain in detail the rationale behind each option.

Accept: Accepting an offer from Player A reflects a classic option in the literature [6]. When accepting an offer from Player A, Player B is typically agreeing to receive a smaller amount relative to what Player A apportions for him or herself.

Punish: Although choosing to punish in the Ultimatum Game traditionally requires participants to select the option where neither player receives any money ($0, $0)[7], we modified this option to allow for minor fiscal payout. We rationalized that punishing Player A by dropping their payout to equal the amount offered to Player B was a moderate form of punishment not resulting in a null payout for either player. In this case, Player B's payout is not altered, and instead Player A's payout is reduced to match the initial offer to Player B.

Reverse: According to the theory of retributive justice, the most appropriate response is to ensure that punishment is proportionate to the crime committed. Retributive justice is as old as recorded history, and is enshrined within legal documents and cultures around the world. These philosophies have been formalized in classic psychological theory: if the punishment fits the crime, a person is deservingly punished proportionate to the moral wrong committed. This is typically referred to as a 'just deserts' or deservingness principle[8]. In order to operationalize this in our task, we reasoned that reversing the Players' outcomes allows for the maximum punishment to be applied to Player A while also giving the maximum compensation to Player B. Moreover, reversing the Players' payouts results in Player A receiving what was initially assigned for Player B, and vice versa—a direct implementation of the 'just deserts' principle.

Compensate: While most modern societies endorse punishment as a standard practice for restoring justice, in some primitive societies, in lieu of punishing the criminal, justice could be restored by providing monetary compensation to the victim[9]. More recently, research has also demonstrated that people have strong social preferences for equitable and efficient outcomes that increases the payouts of all recipients[10]. Indeed, theories of fairness[3] predict that people may have a preference to compensate rather than punish. Given this, we operationalized 'compensation' as increasing the victim's (Player B) monetary payout without decreasing Player A's payout (the Pareto efficient option). While this option increases the total monetary pie—such that Player A and Player B can both receive more money then was initially endowed to

Player A—there are many examples in the real world where such scenarios transpire. For instance, when filing an insurance claim for stolen goods, it is unlikely that the stolen goods will be recovered and recouped by the victim. Because of this, the insurance company provides monetary compensation to cover the stolen goods. In this case, both the criminal and the victim end up with increased fiscal benefit.

Equity: This option reflects two motivations that are not mutually exclusive. First, the option to equally distribute the payouts ($5, $5) allows for a moderate amount of compensation for the victim and a moderate amount of punishment to be applied to the transgressor. This option allows participants to balance a desire to both compensate and punish. Second, in much the same way that 'compensating' distributes equal payouts to both players, the 'equity' option also controls for participants' putative aversion to inequality[3].

Experiment 1 Choice Data

We plot the data for all unfair offer types (Figure S1). Player As routinely offered highly unfair splits of $\binom{9}{1}$. Regardless of how unfair the offer from Player A is, Player Bs prefer to compensate and apply no punishment to Player A. Table S1 delineates the endorsement of each option compared to every other option for each offer type (pairwise comparisons). For example, for a $\binom{9}{1}$ split, participants chose to compensate 99% of the time when the other presented option was equity, 99% when the other option presented was accept, 100% when the other option presented was punish, and 65% of the time when other option presented was reverse.

Experiment 1 Strategies

After finishing the experiment, we asked all participants to describe in their own words their strategy used during the game. Below we include a handful of representative comments from Player A.

- *"I always selected the highest payoff for me."*
- *"I felt kinda bad doing $1 for B, so I did $2. I was hoping by not giving the absolute minimum they would show mercy to me if they to choose between lowering my pay or accepting the offer."*
- *"Max payout for myself"*
- *"I gave B as little as possible and hoped B's options were in my favor"*

Below we include a handful of representative comments from Player B.

- *"I always chose the profitable option while trying not to hurt Player A"*
- *"I picked the option that was best for both of us, unless I was going to make a significantly less amount than the other player"*
- *"I picked whichever gave me the most money while also trying to benefit role A if I could"*
- *"I was Player B, so usually I selected the option that benefited [sic] both players"*
- *"I picked the highest amount for myself. If both options were to yield the same payout for me I picked what gave (player) A the most"*

Experiments 3-6 Choice Data

Figure S2A illustrates participants' responses across all offer types when deciding for themselves. Although we found significant preferences for 'compensate' compared to every other option across all offer levels (X^2s > 11.79, 1df, Ps < 0.001 analyses across all four experiments [18]), participants' preferences also depended on what type of offer they received. As the offer became increasingly unfair, participants preferentially chose to 'reverse' the outcomes, an option that simultaneously compensates themselves and punishes Player A. When deciding for another (Other condition), participants exhibit similar behavior for most offer types ($\binom{.60}{.40}$ splits –$\binom{.80}{.20}$ splits). However, when the offer became highly unfair $\binom{.90}{.10}$, participants shifted their behavior remarkably, such that the 'reverse' option became the most preferred response (Fig S3B).

Directly comparing responses between the Self and Other condition for relatively fair offers ($.60, $.40) compared to highly unfair offers $\binom{.90}{.10}$ reveals differential behavior across the two conditions, such that participants chose the most retributive option ('reverse') significantly more when deciding for another when the offer is highly unfair (see manuscript for analysis). However, directly comparing responses between the 'Self' and 'Other' conditions for $.60, $.40 and $.70, $.30 offers, illustrate remarkably similar results between the two conditions (X^2=4.0, 4df, p=.40). This suggests then when presented with relatively fair offers, participants appear to process these offers in a relatively similar fashion for both themselves and others.

Experiments 3-6 Reaction Time Data

To help understand the cognitive mechanisms underlying choice behavior to restore justice, we examined the speed (reaction times) with which participants made their choices in Experiments 3-6. Because analyzing reaction time data in a between group design has many pitfalls, including difficulties in interpreting individual differences at the group level (e.g. it is not clear which particular processes are contributing to any observed group differences[19]), we did not analyze reaction times in Experiments 1 and 2. Since participants completed *both* the Self and Other conditions in Experiments 3-6, we were able to directly compare the speed in which choices were made for the self compared to those made for others. Because we did not limit participants' decision time, reaction times were right-skewed. To help normalize the data for subsequent analyses, we log-transformed (base 10) all reaction times.

First, we expected that the severity of the fairness violation would affect the speed at which choices were made. In line with this, we found a main effect of offer type, such that as Player A's offer became increasingly unfair, participants responded faster (repeated measures ANOVA $F(3,1308)=85.2$, $p<0.001$ (N=437), Fig S5A). Second, we also expected to see a difference in response times for choices made for the self compared to those made for others. It is possible that decisions involving personal benefit or loss (Self condition) are associated with greater automaticity, and thus are made more quickly than those made on behalf of another. It is also possible, however, that choices made for the self are more personally consequential, requiring greater deliberation and reflection, and are thus made more slowly than the non-consequential choices made for others. Analysis revealed that participants were quicker to decide for another (1.89s SD±.56) than for themselves (1.99s SD±.54; ($F(1,436)=33.87$, $p<0.001$, reaction times broken down by offer type and condition: Fig S5/S6), suggesting that choice for others entail less deliberation compared to choice for the self.

Moreover, there was an interaction such that as the offer became increasingly unfair $\binom{.90}{.10}$, the difference in speed between choices made in the Self and Other conditions diminished ($F(3,1308)=227.3$, $p<0.001$, partial $\eta^2 = 0.34$; Fig 7A, each offer type significantly differing from its neighbor, Fisher LSD post-hoc tests; Ps < 0.05). Although choices for others were made significantly faster than those for the self, it is possible that choosing to compensate requires greater deliberation than when deciding to punish. Thus, in order to control for response type, we directly compared whether retributive choices for others were also made more quickly than retributive choices for the self. In line with this, we found that decisions to 'reverse' the payouts on behalf of another were made significantly faster (1.99s SD±.75) than the same decision for the self (2.11s SD±.69: $t(474)=2.56$, $p=0.01$, Fig S7B). Participants were slower to punish the transgressor after directly experiencing a fairness violation.

Countering the classic notion that third-parties—e.g. juries—respond in a more reflective, deliberative manner, this data suggests that endorsing punishment on behalf of another is actually associated with a faster, more automatic process, compared to when personally responding to a fairness violation. In other words, despite the conventional wisdom that we are more deliberative and thoughtful when acting on behalf of wronged others[20], instead we find that such choices are *less* deliberative. In addition, that retributive responses were associated with greater automaticity, dovetails with existing work indicating that emotion related processes play a guiding role in driving punishment[21,22].

Caveats

It is possible that some participants believed that the most fiscally beneficial move is for Player A to offer a $\binom{.90}{.10}$ split. If Player B then chooses to 'compensate', both players can maximize their payouts by each making $.90. In other words, joint payoff is maximized if Player A makes an initial unfair offer, and Player B then chooses to compensate him or herself and not apply any punishment to Player A. From this perspective, the wisest strategic move is for Player A to always offer the most unfair split and anything less than a $\binom{.90}{.10}$ split should be construed as leaving 'money on the table'. If this is indeed a strategy that participants employed while playing the task, then all other offers $\binom{.60}{.40} - \binom{.80}{.20}$ should be punished at a higher rate than a $\binom{.90}{.10}$ split, and participants should not display any punitive behavior when offered a $\binom{.90}{.10}$ split. Contrary to this, participants' responded with increasingly punitive and retaliatory behavior as the offer became increasingly unfair. However, to check whether participants were operating under this assumption, we debriefed participants at the end of the task and asked them to describe their strategies. Participants' comments during debriefing do not suggest that they believed Player A was acting strategically by offering a highly unfair split (see debriefing section below). Given these factors, it is unlikely that the lack of punishment towards Player A can be explained by participants engaging in the task from the perspective that $\binom{.90}{.10}$ is the most strategic, lucrative, and optimal first move.

Experiments 2-6 Strategies

We asked participants to describe in their own words their strategy for when Player A offered a $.60, $.10 split to them, and to another Player B, and also their strategy for when Player A offered a $.90, $.10 split to them, and to another Player B. This allowed us to explore how participants perceived the intentions of Player A, and to comment on their thought process when deciding to reapportion the payouts. Below we provide a representative sample of the participants' comments for highly unfair and relatively fair splits when they were Player B and when they were Player C.

Question: In your words please describe your strategy for a scenario when Player A kept $.90 and offered $.10 to you.

- *"Instead of tumbling into a vindictive wonderland and punishing A severely, I took the opportunity to make major bank while keeping the playing field even"*
- *"I tried to understand the other person's perspective and tried to equalize by giving both of us .90 instead of focusing on the punishment"*
- *"I was slightly offended by this, but rather than punish player A, I thought it would be more civil to cut the sum evenly in half."*
- *"This is totally unfair and I would overturn the decision, but instead of punishing Player A I would allow for both of us to receive $0.90."*
- *"Feel that A should be punished and would want to reverse the roles, however, they have already played, it is better to give everyone equal and higher money than anyone less."*
- *"That was extremely unfair, so I tried to make it more fair - and even."*
- *"Selfishness shouldn't [sic] be rewarded"*
- *"I was interested in teaching by example. Just because someone was unfair to me doesn't mean I had to be unfair back."*
- *"That is very unfair to me -- it's pretty bad -- shame on player A!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!"*

Question: In your words please describe your strategy for a scenario when Player A kept $.90 and offered $.10 to another Player B (when you were Player C).

- *"I wasn't going to sit around and watch inequality happen, so I choose to eradicate A's advantage/privilege and bringing B up to A's level, so there'd be no income gap/power-advantage. It adds more throughput in the economy, and when I'm B I'd find that a pleasant surprise"*
- *"Its not up to me to forgive player A"*
- *"That was unfair, and I wanted to reverse it so the other player got the unfair payment."*
- *"Player A is greedy and deserves to be punished by only getting $.10 and Player B receiving $.90"*
- *"As I don't want player B to be upset, (especially with ME, since I have the power to change things) I'd upset both people as little as possible"*
- *"That's being greedy and unfair. When I had the chance to right what I felt was wrong, I did it"*
- *"I punished Player A for being selfish, and rewarded Player B because B almost was taken advantage of"*
- *"Grossly unfair. Punish player A if possible, get the most for player B as a higher priority."*

- *"I am still a utilitarian, though it feels more right in this circumstance to reverse the funds for each player with A getting the dime he would have given to B."*
- *"Since player A was being very unfair, I wanted to punish him to make sure he got as little as possible."*

Question: In your words please describe your strategy for a scenario when Player A kept $.60 and offered $.40 to you.

- *"I would choose the option that made both of us get $.60. I felt his offer was somewhat fair so I decided not to deduct anything from Player A."*
- *"I thought it was rather fair, and I don't think I penalized anyway as a result of tying to be close to evenly fair."*
- *"Since Player A tried to be mostly fair, I wanted to maximize the payoff for both of us."*
- *"That is close to fair so I decided to let the offer stand."*
- *"Mostly fair so didn't [sic] punish A, just raised my own stake to .60, also I thought it was kind of fair but decided to make it more equal."*
- *"Since this isn't horribly unfair, I would prefer to give us both .60 or the .50/.50 split....certainly I would not reverse the winnings or punish Player A by giving us both .40."*
- *"This was so close, that it wasn't worth quibbling over 10 cents difference."*
- *"It seemed fair enough. I would have done the same."*

Question: In your words please describe your strategy for a scenario when Player A kept $.60 and offered $.40 to another Player B (when you were Player C).

- *"I thought it was a fair enough offer, although [sic] it could be a little more balanced."*
- *"Once again as long as player A was trying to be fair, then I wanted to try to maximize the payoffs for both players."*
- *"It was somewhat fair, but 50/50 is a better response."*
- *"I maximized the money each player made, as long as it was equal."*
- *"I considered that fair so I made each of them get $.60."*
- *"In this case, I am more likely to give the .50/.50 split because the .10 loss to Player A is still a signal that fairness should be key...however, the original split isn't so unfair that I would penalize A."*
- *"This was fairly equitable, so I would choose to boost B rather than punish A."*
- *"I see that Player A was trying to be reasonably fair, and bump Player B to 60 cents also, in order for both the players to win."*
- *"He thinks he can pull the fleece over b's eyes! He's got something else coming [sic]!"*

Participants' comments indicate that when Player A offered a $.90, $.10 split, participants genuinely felt that it was unfair and not a strategic first move. In fact, none of the 898 participants indicated that a $.90, $.10 split was an optimal first move that could maximize all Players' fiscal payout. Given this, we are confident that participants were not interpreting Player A's highly unfair offers as an intention to be cooperative by maximizing the Players' payouts.

SUPPLEMENTARY METHODS

Experiment 1 Protocol

At the start of each trial in Experiment 1 neither Player A nor Player B knew which options would be made available to Player B on that trial. Randomly pairing the options on each trial such that the option to compensate was not always available prevents Player A from believing that a $9/1 offer is the most optimal and beneficial first move for both Player A and Player B. That is, a $9/1 split can only be considered optimal if Player A knows that Player B has the option to compensate. With this framework, Player A cannot rely on a strategy that offering a $9/1 split maximizes both participants' payouts. Additionally, this dynamic simulates a more naturalistic setting, where people in real world situations typically do not have full information on how others will respond to their choices.

Participants were also told that one trial would be randomly selected by the computer to be paid out. Half the time the trial would be paid out according to the decision of Player B on that trial, and half of the time the computer would treat the trial like a dictator game such that the randomly selected trial would be paid out according to the split suggested by Player A. This payout structure was added so that Player B would know that 50% of the time Player A could maximize their own payout irrespective of Player B's decisions, and to minimize fair offers from Player As. Given that 50% of the trials would be paid out as dictator games, Player As should employ a strategy that will maximize their payouts (a selfish strategy). In addition to the $10 show up fee, participants were able to make an additional payout based on their and their partners' choices (up to $9). Finally, participants were told that during a given experimental session, they would play against many other players in the room, and that on each round (70 rounds in total) they would be paired with a different partner, therefore they should treat each round as a new interaction.

The experimenter read the following instructions out loud to all participants:

"T*oday you are going to be being playing a game with other players in the room. You will be playing for real money and you will be paid out based on your decisions and the decisions of others. In this game there are two players – Players A and B. At the start of each round Player A will be endowed with $10 and will decide how to divide the $10 between themselves and Player B. For example, Player A can divide the money so that he/she gets $9 and Player B gets $1. Player As can offer however much money they want to Player B's so long as it is in whole dollar increments between $1 and $9. Player A will keep the remaining amount. That is, if Player A offers B $1, they retain $9 for themselves. After Player A has made an offer to Player B, Player B will then be presented with options to reapportion the money. Altogether there are five types of options in this game, however, it is important to note that only 2 of these 5 options will be available in any single given interaction."*

"Lets say that Player A divides the $10 by keeping $8 and offering Player B $2. Given A's division of the money, here are the five types of options that B could have. The first option would allow B to decrease A's monetary outcome such that both players receive $2; the second option would increase B's monetary outcome such that both players receive $8; the third option would equally distribute the money between A and B such that both players receive $5; the fourth option would reverse the offer from A such that A will receive $2 and B will receive $8; and the fifth option would accept the offer from A, without changing it. Remember: on any given trial, B's will only have two of these five option types available to them. Only 2 options will be presented at one time to Player B. These two options could be any combination of the options described earlier. The available option types are randomly selected from trial to trial."

"To determine the final payouts for all Players, the program will randomly select 1 trial at the end of the experiment. This one trial will be realized—that is, paid out. 50% of the time both players will be paid whatever B decided on that trial. 50% of the time the computer will ignore B's choice, and simply apportion the money as A had proposed. This means that half of the time, whatever A decided is what happens (like a "dictator game").

Experiments 2-6 Protocol

Amazon Mechanical Turk

Participants were recruited for these experiments using the online labour market Amazon Mechanical Turk (AMT). AMT is an online market in which "employers" can pay "workers" to complete relatively short tasks for small amounts of money. In our experiments, our participants ("workers") received a baseline non-waivable payment of $0.50, in addition to which they could receive a bonus depending on their choices. In other words, participants were incentivized to report their real preferences as one of their choices would be realized and paid out.

One benefit of AMT is that it provides a subject pool that is typically much more diverse than the subject pools available at most American universities [11]—including variation across age, ethnicity, and socio-economic status—ultimately providing a more representative sample of the true population. In an initial pilot study we recruited participants from around the world. However, we discovered through the online debriefing portion of the experiment—where participants were asked to write down their choice strategies—that task comprehension was often poor. To ensure a high level of data quality (e.g. from participants who completely understood the task), we decided to restrict our recruitment to participants based in the United States.

The use of AMT presents some potential concerns not otherwise present in laboratory settings. To address these concerns, a number of studies have explored the validity of data gathered on AMT. Across multiple domains, the behavior reported from AMT participants parallels the behavior found in laboratory participants, indicating the validity and reliability of AMT data [11-17]. In fact, even economic games run on AMT that use stakes 10-fold lower than those run within the laboratory demonstrate similar behavioral results [13,14].

Amazon Mechanical Turk Procedure

While each of the five experiments was slightly different (see below), all the experiments began with a similar set of instructions. When explaining the rules of the game, the instructions explicitly framed offers as fair and unfair. This was done for two reasons. First, in order to make sure that online Mturkers were aware of what a fairness violation was, and second to minimize how participants interpreted the offers.

Instructions for Experiments 2-6

"*The purpose of this task is to study how people make decisions. You will be making decisions that affect the monetary outcomes of YOURSELF and OTHERS. You will be playing multiple rounds of a game. Each round will be one of two scenarios. You will be informed of which scenario you are playing at the start of each round. There are two scenarios: in scenario 1 you will be playing as player B and in scenario 2 you will be playing as player C" (a figure was shown illustrating the dynamics of the game).*

"In both scenarios, Player A has been allotted $1.00. You will interact with a different Player A on each round. Each Player A has already decided how much of their $1 to share with Player B. Player A can decide to split the $1 however they want, ranging from keeping nearly all the money ($.90 for themselves and $.10 for their partner) or splitting the money evenly ($.50 for themselves and $.50 for their partner). After observing the split that Player A has made, you will be asked to make a decision that will determine the monetary outcome of both Player A and Player B. You can decide to: 1. Decrease Player A's money (thereby punishing them for an unfair offer) 2. Increase Player B's money (thereby compensating them for receiving an unfair

offer) 3. Keep both Players' money the same (thereby accepting the offer from Player A) 4. Reverse both Players' money (thereby ensuring that Player A is punished and Player B is compensated) 5. Equally split the money between both Players. Ultimately, you will decide how much money Player A and B actually receive. "

"IMPORTANT: You will be playing multiple rounds of this game. Sometimes as Player B and sometimes as Player C. In Scenario 1, YOU will be Player B and you are making the choice for your own monetary outcome. In other words, you will have a personal stake in the outcomes, and you will have the chance to make additional money depending on your choices. In Scenario 2, you are making the choice on behalf of a 3rd person, another Player B. That is, you will not yourself be invested in the decision when you are deciding as Player C, but you will make choices that will effect the monetary outcomes of another Player B. When you are making decisions as Player C, you will not make an additional bonus but Players A and B could make additional money depending on your choices."

"During the task itself, please place your hands on the keys S, D, F, H, and J. Each of these keys will correspond to a different response. Once you hit the key, your decision will be recorded and the next trial will appear, so please be certain of your choice before hitting the key. YOUR MOUSE WILL NOT WORK DURING THE TASK so do not use the mouse to tick the boxes."

Participants were then presented with an example trial, and then explained step-by-step what happened in the example trial, Fig S4.

"In this example, Player A unfairly divides the $1.00 endowment by keeping $.80 and giving Player B $.20. Immediately below that, you can see the options that will change the monetary outcomes of both players. Hitting the ***S*** *key will result in reversing the outcomes of Player A and Player B (Player A will be punished for offering an unfair division and Player B will be compensated for receiving an unfair offer). Hitting the* ***D*** *key will result in an equal split between the players. Hitting the* ***F*** *key will result in decreasing Player A's outcome while keeping Player B's outcome the same (Player A will be punished for offering an unfair division and will thus receive $.20, the same amount that Player B will receive, $.20). Hitting the* ***H*** *key will result in increasing Player B's outcome, while keeping Player A's outcome the same (both Players will receive $.80; thus, Player B is being compensated for receiving an unfair division). Hitting the* ***J*** *key will result in keeping the Players' outcomes the same as suggested by Player A. IMPORTANT: The choices that you will see will never be in the same order, so pay attention!"*

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