

Taking Punishment into Your Own Hands: An Experiment on the Motivation Underlying Punishment[☆]

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Abstract

In a punishment experiment, we separate the demand for punishment in general from the demand to conduct punishment personally. Subjects experience an unfair split of their earnings from a real effort task and have to decide on the punishment of the person who determines the distribution. First, it is established whether the allocator's payoff is reduced and, afterwards, subjects take part in a second price auction for the right to (physically) carry out the act of payoff reduction themselves. Subjects bid positive amounts and are happier if they get to punish personally.

Keywords: personal punishment, real effort task, experiment, auction, desire to win.

JEL-Classifications: C92, D03.

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If the person who had done us some great injury, who had murdered our father or our brother, for example, should soon afterwards die of a fever, or even be brought to the scaffold upon account of some other crime, though it might sooth our hatred, it would not fully gratify our resentment. Resentment would prompt us to desire, not only that he should be punished, but that he should be punished by our means, and upon account of that particular injury which he had done to us.
(Adam Smith¹)

1. Introduction

The desire for revenge, to punish those who did wrong upon oneself, is a strong motivation for humans. From ancient Greek dramas to modern movies, it is ubiquitous in storylines. It has also been the focus of extensive research in economics, both in the form of experiments which find that, indeed, subjects are willing to forgo monetary gains to exert punishment, and in the form of theoretical models that seek to explain such behavior. However, both the quote by Adam Smith above and many prominent fictional works² feature a very specific form of punishment: According to Adam Smith, humans not only care about punishment being inflicted on the perpetrator of a crime against them, but they also value carrying out that punishment themselves, in person. It is this, personal, characteristic of punishment that we try to isolate in the laboratory. Our experiment is designed to exclude other possible reasons why one would be willing to give up money to punish. In particular, subjects do not have to spend money to assure punishment is carried out, they only spend money to assure it is carried out by them personally.

Punishment has been documented in various experiments, especially in social dilemma situations where individual and group incentives diverge and free-riding occurs. One of the first experiments of this kind was conducted by Ostrom, Walker, and Gardner (1992), where subjects who played various rounds in a common pool resource game were willing to pay a fee to place a fine on other subjects who over-extracted the resource. Fehr and Gächter (2000) demonstrate that costly punishment of free-riders who do not contribute occurs in a public goods experiment, with punishment leading to higher levels of cooperation. Nikiforakis and Normann (2008) analyze the effectiveness of such peer-imposed

¹In *The Theory of Moral Sentiments*, page 113.

²To use two well known movies as examples: In *Pulp Fiction*, after being rescued from a rapist by Butch, Marsellus tells Butch, who is about to kill the rapist, to move aside, so he can shoot the rapist himself. Similarly, in *Dogville*, Grace, after ordering her father's men to torch the village which enslaved her, kills the man who hurt her most personally, telling her father: "Some things, you have to do yourself".

punishment in a public good game, finding that contributions increase in the effectiveness. In contrast, Falkinger, Fehr, Gächter, and Winter-Ebmer (2000) use punishment imposed “automatically” by the experimenter on non-contributors. Both peer-imposed and experimenter-imposed punishment raises contributions. However, subjects are not only motivated by the monetary consequences of punishment. As Masclet, Noussair, Tucker, and Villeval (2003) show, even non-monetary punishment, the expression of disapproval by others, leads to the same result. Masclet, Noussair, Tucker, and Villeval (2003) are mainly interested in the receiving side of the punishment, but it is also interesting to investigate the decision process of the punishing side.

Direct neuroeconomic evidence that subjects “like” to punish was found by de Quervain, Fischbacher, Treyer, Schellhammer, Schnyder, Buck, and Fehr (2004), who use PET recordings of brain activation to investigate the mechanisms in the brain involved in punishment. Subjects played a trust game where cooperating players could punish defecting partners. In the punishment condition activation of the dorsal striatum was found, which is well known for its reward processing properties.

This could either be due to the fact that the defecting partner lost money or it could be pleasure derived from the act of punishing. Based on their finding that subjects do not condition the amount of their own punishment onto the punishment already dealt (to the same person) by other subjects, Casari and Luini (2009), speculate in the same vein that “the punisher derives her utility from the act of punishment in itself and not from achieving, in conjunction with other punishers, a total amount of punishment.”

Spurred on by the experimental observation that people do not always act purely selfish, new theories of other-regarding preferences have been put forward, capturing phenomena like fairness, altruism, inequity aversion. Levine (1998) uses an adjusted utility which is supplemented by a term which takes into account the opponent’s utility weighted by an altruism coefficient. Inequity aversion models add to the utility derived from own income a term that represents concern about the payoff distribution; Fehr and Schmidt (1999) use the difference between the subject’s own payoff and the payoffs of the opponents, Bolton and Ockenfels (2000) the proportion of own payoff to total payoffs.

Other theories develop techniques to embed concerns for reciprocity. Rabin (1993) models reciprocity in normal form games by adding psychological payoffs to the material payoffs. This additional term captures intentions via beliefs of the players and defines the kindness of players in relation to his possible actions. Dufwenberg and Kirchsteiger (2004) dilate this approach to sequential games. Falk and Fischbacher (2006) also transform standard games into psychological games. In their model, utility of the players depends not only on the payoffs but also on a reciprocity term which embodies kindness and reciprocation.

	real effort	punishment opportunity	auction for personal punishment	auction for dummy envelope
1A	yes	yes	yes	no
2A	yes	yes	yes	yes
NC	no	no	no	yes

Table 1: Experimental designs

All of these theories incorporate the opponent’s outcome into the utility of the player, and several can explain reciprocal behavior or punishment. However, we are not primarily interested in the fact that the payoff of an offender is reduced, but especially in *who* will derive satisfaction from punishing. Only the person who conducted the punishment? Or everyone who saw the offender being punished, even if the punishment was not conducted “personally”?

Perhaps the theory closest to our design is the one by Andreoni (1990). He examines private provision of a public good and models the utility of the individuals as a function not only of the amount of the public good but also of the own gift to the public good. This individual donation produces what Andreoni calls a “warm glow”, utility derived from the act of giving. If one assumes in almost the same manner that the act of punishing enters the utility function, one would arrive at a theory that could account for a demand to punish personally.

In the next section, we introduce the design we use to investigate personal punishment. Section 3 presents our hypotheses and Section 4 the results. Finally in Section 5, we conclude with a discussion.

2. Experiment

2.1. Design

To test the demand for personal punishment, we use three related experimental designs, 1A (one auction), 2A (two auctions) and NC (no context).³ We start by describing 1A.

Design 1A. Subjects were matched in groups of four; each group consists of three subjects *A* and one subject *B*. The experiment was anonymous, so no subject knew about the other subjects he or she was matched with. Instructions for the experiment, which fully described the experiment for both type *A* and type *B*, were handed to subjects at the start of the experiment. After reading the instructions, subjects had to answer a series of detailed questions in order

³See Online-Appendix for translations of all instruction material: <http://www.uni-heidelberg.de/md/awi/professuren/with2/pdjm-pp-appendix.zip>

to make sure that they understood the experimental instructions. Only when all subjects had correctly answered these test questions, did the experiment proceed.⁴

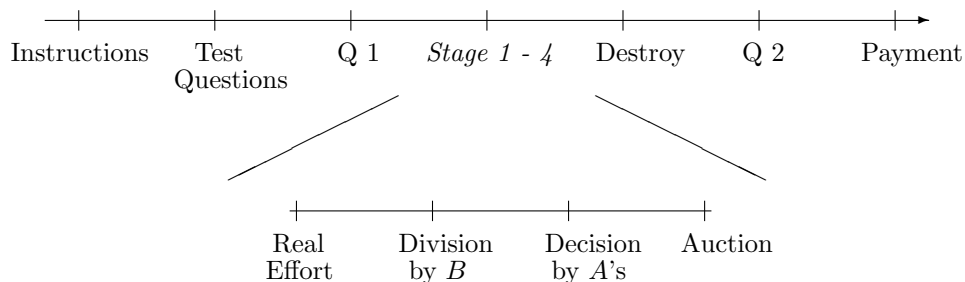


Figure 1: Timing

In the first stage,⁵ all subjects A participated in a real effort task where they could earn EUR 10. They were asked to fill a sheet of graph paper (A5, 148×210 mm, about 1260 squares) with alternating o and $+$ signs. The allocated time frame was 25 minutes. Subjects who did not finish the task in time dropped out of the experiment and received no money apart from the show up fee. We chose this particular task for two reasons: First, it is simple and does not require any special abilities, so all subjects should be equally fit for the task. Second, as we found out in previous tests, the task is considerably more exhausting than it appears. We wanted to induce a feeling of ownership towards the money in those subjects who completed the task. On the other hand, it was to look easy to the non-participating subjects B . During the task, all subjects B were sitting in the same room as the subjects A , but without any assignment.

After the task, the experimenters collected the sheets and informed each subject B how many subjects A in her group had succeeded. Upon learning that information, in stage two, subject B had to decide on an allocation of the money earned by the subjects A in the previous stage. The only two allocations available were $(2,8)$: 2 for A , 8 for B , or $(10,0)$: 10 for A , 0 for B . Subject B could only implement the same allocation for all three subjects A she was matched with, not different allocations for different subjects A . So in the case of three successful subjects A subject B had to decide between 24 for herself

⁴Subjects who were not able to answer the test questions correctly were replaced by extra participants (who were otherwise dismissed with a flat payment after reading the instructions).

⁵The instructions use a different numbering, since we subdivided some stages for clarity. We also handed to all subjects a flow chart as an overview what happens in each stage. The flow charts are included in the Online-Appendix.

and 2 for each A or 0 for herself and 10 for each A .

Before stage three, the experimenters informed all subjects A about the decision of their matched B . The money that subject B allocated to A was handed to subject A . The money that subject B allocated to herself was *also handed to subject A* , however it was put in an envelope. Then all subjects A had to decide whether they wanted to reduce subject B 's payoff by destroying one of the three envelopes designated for B . If all A 's decided not to reduce, the envelopes were collected by the experimenters, handed to subject B and stage four did not take place.

If at least one subject A decided to reduce, the entire group entered stage four. Here, all subjects A of the group took part in a sealed bid second price auction. The highest bidder won the right to destroy the envelope lying in front of him. Only the envelope of the winner was destroyed.⁶ Note that subjects B 's payoff depends entirely on stages 1 to 3. The auction only selected the subject A who would destroy the envelope, it did not affect subject B 's payoff. The auction provides a non-arbitrary way to separate the decision to punish from the decision to punish personally. Since, in a second price auction, no participant has a reason to misrepresent his preferences, subjects are incentivized to truthfully state the value they attach to personal punishment.

The auction winner was informed that he won the auction and about the second highest bid he had to pay. He could then proceed to destroy the envelope of subject B . The instructions did not specify any mode of destruction; however a small metal bin was present on the tables of each subject A .⁷ The envelopes in front of the non-winning subjects A were collected by the experimenters and delivered to the respective subject B .

Between the test questions and the real effort task we asked some demographics from our subjects and two questions about their happiness (“how happy are you in general”/“how happy are you right now”). After stage four and before paying, we presented subjects with a second questionnaire asking their happiness again (only “how happy are you right now”), their perception of subject B 's behavior and several attitude questions⁸. All subjects received a EUR 8 “show up fee” for answering the questionnaires. If a subject A had won the auction and had to pay more money than he earned in the experiment, he had to use a part of those EUR 8 to pay for his bid.

⁶The minimum feasible bid was zero, the maximum feasible bid 10 and subjects could bid in increments of 0.01 (one cent). If there was a tie, the experimenters randomly chose a winner. This also applies to the special case of all three subjects A choosing a bid of zero.

⁷The subjects chose different methods to “destroy”: Most ripped the envelope apart – some ripped just once, some ripped until only small pieces of paper were left – and deposited the pieces inside the metal bin. Some just folded the envelope.

⁸See Online-Appendix.

Design 2A. The 2A design is similar to design 1A, with the difference that it uses two auctions instead of one. Stages one to three are identical to 1A. However, in the auction stage, subjects had to make two bids. Bid one was for the auction as described above. For the second auction, the experimenters placed a second envelope in front of the each subject *A*. The instructions stated that this envelope would be, unless destroyed, collected again by the experimenters and would never have any influence on the payoff of subjects *A* or subjects *B*. That is, the second envelope is a dummy, intended to test whether subjects would be willing to pay for destruction of *any* envelope. After bids were made, the experimenters threw a coin in public to determine whether auction one or auction two would be enacted. Only the bids from the chosen auction did count, and only the envelope from the auction chosen was destroyed by the winning subject *A*. If auction one was chosen, the winner destroyed his envelope from auction one, the other envelopes were handed to subject *B*, and all three envelopes from auction two were collected by experimenters. If auction two was chosen, the winner destroyed his envelope from auction two, the other envelopes from auction two were collected by the experimenters. In this case, the experimenters also randomly retained one of the envelopes from auction one, such that subject *B* only received the same amount of envelopes, no matter whether auction one or auction two was chosen by the coinflip.

Design NC. Finally, we used the NC condition to separate the auction stage from the rest of our experiment. To insure that conditions remained comparable, we conducted the control subsequent to another, unrelated and about 1 hour long, experiment, where the subjects earned on average EUR 10.60.⁹ This money was used to pay for bids in the control auction. After the end of the other experiment, we distributed the instructions for NC. Instructions and test questions were as close as possible to those in the main experiment, but only included the auction stage.¹⁰

Subjects were placed in groups of three (corresponding to our group size of three subjects *A*, who did participate in the auction). The highest bidder won the right to destroy an envelope lying in front of him (the envelope was not payoff relevant, as in auction two of 2A). The winner of the auction could destroy the envelope, all others were collected by the experimenters. Auction winners were paid what they earned in the prior experiment minus the second highest bid in their group.

⁹This is close to the average earnings of EUR 10.81 that subjects of type *A* had accumulated in the other conditions (2A and 1A) before the auction was conducted.

¹⁰We used both envelopes filled with paper money and empty envelopes (the unrelated prior experiment did not use paper money), but did not find any difference and pooled the data.

2.2. Procedures

The experiment was conducted in the laboratory of the economics department at the University of Heidelberg and the laboratory of the Sonderforschungsbereich 504 in Mannheim. In total, 149 subjects participated in the experiment (40% male, 60% female). Subjects were students of various fields at the University of Heidelberg and the University of Mannheim. The experiment consisted of nine sessions; no subject participated twice. All recruitment was done via ORSEE (Greiner (2004)).

In total, the experiment lasted slightly less than 2 hours, for which we paid an average of EUR 13.79.¹¹ The full experiment was conducted via pen and paper. During the experiment, we used an experimental currency unit called “Thaler”. Thaler were a printed play money handed to subjects during the experiment. At the end of the experiment, we exchanged all Thaler into Euro at a rate of 1:1.¹² All subjects were paid in cash and private.

3. Hypotheses

According to the classic and outcome based social preference theories subjects should not care about the way in which subject B 's payoff is reduced. On the other hand, following the reasoning put forward by Adam Smith, subjects should care about punishing personally, so we formulate our main hypothesis:

Hypothesis 1. *Personal punishment: Subjects A bid more in the personal punishment auction than in the dummy auction.*

Connected to hypothesis 1 we would also expect those subjects who punish personally to have some emotional payoff from doing so that makes their monetary loss worthwhile.

Hypothesis 2. *Happiness: Subjects A who punish personally are happier than those who do not.*

4. Results

Stages one and two of our auction designs were constructed to produce a large number of observations where punishment could possibly occur. A first look at the data confirms that this goal is achieved. All 87 subjects A in 1A and 2A did complete the real effort task, therefore all 29 subjects B had to make their decision for 3 matched successful subjects A . Out of the 29 subjects B , all

¹¹Only averaging over subjects in 1A and 2A.

¹²The main reason for using play money was that we did not want subjects to worry about destroying legal tender.

	Avg.(SD)	Max	> 0	= 0
Bid punishment auction	0.43 (1.11)	5.5	36%	64%
Wanted auction	0.51 (1.24)	5.5	46%	54%
Did not want auction	0.32 (0.93)	4.0	22%	78%
Bid dummy auction	0.03 (0.10)	0.5	17%	83%
Bid in NC auction	0.67 (1.78)	6.5	52%	48%

Row 1 to 3: subjects A 's bids in 1A and in the punishment auction in 2A.
Row 4: bids in dummy auction in design 2A. Row 5: bids in design NC.

Table 2: Bids

but 3 did implement the allocation $(2, 8)$, which was worse for subjects A . All three subjects B implementing $(10, 0)$ played in design 1A.¹³

Trying to find personal punishment is only viable if there is some punishment in the first place. Given the allocation of their matched subject B , all subjects A could chose to have the auction in stage four implemented. Demanding the auction is equivalent to subject B being punished, since this ensures that subject B 's payoff will be reduced by 8. In line with our expectations, subjects A who faced the “bad” $(2,8)$ split demand the auction significantly more often than those who got the “nice” $(10, 0)$ allocation ($p = 0.040$, one-sided Fisher-exact test). In total, 55% of subjects A demanded the auction. Since the auction is implemented if at least one subject A demands it, this translates into the auction happening in 26 out of 29 groups.¹⁴

Table 2 shows the percentage of subjects A who bid a positive amount in the ensuing auction - split into those who demanded punishment in the previous stage (that is, who wanted the auction to happen) and those who did not. Recall that bids in the auction are not payoff relevant for subject B , only whether the auction happens or not influences the payoff of subject B . Subjects A who are either strict money maximizers or only interested in the monetary consequences of punishment for the matched subject B have no incentive to bid larger than zero. In contrast to that, we find that 36% of our subjects bid positive amounts of money. So a substantial minority of subjects is interested enough in punishing personally to be willing to sacrifice some of their own money to achieve this. While it is somewhat surprising that we also find some positive bids of subjects who did not want the auction to happen in the previous stage, the average bid

¹³The distribution choice of subjects B is similar to the one in a dictator game (Kahneman, Knetsch, and Thaler (1986)) or ultimatum game (Güth, Schmittberger, and Schwarze (1982)) with a restricted choice domain.

¹⁴The three groups missing are not equivalent with the three groups where the $(10, 0)$ decision was implemented. While demand for the auction was lower in these three groups, 2 subjects still wanted the auction to happen. The third $(10, 0)$ group, as well as 2 out of the 26 $(2, 8)$ groups did not see the auction happen.

by subjects who wanted the auction is significantly higher ($p = 0.021$, one-sided MWU test).

The positive bids in the punishment auction indicate that our subjects want personal punishment, but a better test for the existence of personal punishment is to compare the results for the two auctions in design 2A. Here, within subject, are two identical auctions, leading to a similar results (an envelope gets destroyed and subject B loses a payoff of 8). The only difference is whether subjects get to destroy an unrelated envelope or the envelope belonging to subject B . A Wilcoxon Signed Ranks test shows that bids are significantly higher in the punishment auction compared to the dummy auction ($p = 0.016$, one-sided).¹⁵ Therefore we can not reject hypothesis 1.

Result 1. *Subjects bid more in an auction for personal punishment than in a dummy auction, in line with a demand for personal punishment.*

Another interesting comparison is between the auctions in 1A and 2A, where the auctions are embedded in a comprehensible context, to the auction in NC, where we remove the context. The bids in NC are not different from those in the auction for personal punishment ($p=0.235$, MWU test, two-sided), but significantly higher than those in the dummy auction of 2A ($p = 0.006$, MWU test, two-sided). Ex ante, we would have expected the differences to be the other way round. This points out the importance of giving subjects a context in which to evaluate the auction. Without the preceding stages, the auction must have made little sense to subjects in NC.¹⁶ Perhaps they were confused, perhaps they (incorrectly) rationalised the existence of the auction with some not-yet-announced price that would be revealed afterwards, or maybe they felt forced to bid in the absence of any explanation. If this experimenter demand effect (see Zizzo (2010)) exists, it is present in our no context treatment, but not in the (similarly non-consequential) dummy auction of treatment 2A.

Finally, we look at the result of the physical destruction carried out by the winners of the auction. Do they enjoy the act of destroying subject B 's money? We asked all participants for their subjective happiness on a seven point scale at the start and at the end of the experiment.¹⁷ While the absolute level might

¹⁵While very infrequent, there is some bidding in the dummy auction. The answers from the subject with the highest bid in the dummy auction to an open ended question about motivation for bidding are perhaps revealing:

(personal punishment auction): "Even though subject B is in no way affected (since he always gets 2 envelopes), it feels good to release some pressure this way"

(dummy auction): "To erase the feeling of anger, that, even though I did the whole work, candidate B will earn 3x as much"

¹⁶In all designs, subjects had to correctly answer a set of test questions before the experiment proceeded. However, the test questions only related to the mechanism of the auction (and the previous stages for 1A and 2A), not any possible rationale behind holding it.

¹⁷See Online-Appendix for the translated questionnaires.

	regression 1 punishment auctions (1A, 2A)		regression 2 dummy auction (NC)	
	coefficient	<i>p</i> -value	coefficient	<i>p</i> -value
age	-0.006 (0.044)	0.889	-0.003 (0.036)	0.938
female	-0.301 (0.270)	0.269	0.494 (0.385)	0.210
(10, 0) distribution	1.150 (0.479)	0.019		
wanted auction	-0.108 (0.256)	0.674		
bid	0.048 (0.120)	0.689	-0.162 (0.136)	0.244
auction winner	0.659 (0.281)	0.022	0.755 (0.432)	0.092
constant	0.020 (1.039)	0.985	0.086 (1.024)	0.934
N	78		33	
R^2	0.195		0.119	
adj. R^2	0.127		-0.007	

Notes: Dependent variable: happiness difference. Standard errors in parentheses. Bid: Regression 1 uses the bids from the punishment auction (1A and 2A), regression 2 from the dummy auction (NC). In both sessions of 2A, the coin flip chose the punishment auction, therefore the punishment auction was resolved and the data is used in regression 1.

Table 3: Regression on happiness difference

depend on a number of causes we can not control, we can use the difference in happiness between the start and end of the experiment. Let the *happiness difference* be the amount of happiness reported at the end of our experiment minus the amount reported at the start. So subjects with a positive happiness difference felt better after our experiment than before. Table 3 reports two regressions on happiness difference. Not surprisingly, subjects *A* who encountered the allocation (10,0) felt happier compared to those who received only EUR 2 from allocation (2,8). Additionally, subjects *A* who went on to win the auction are happier than those who did not win. So despite being paid less money in the end, subjects who personally destroyed subject *B*'s money leave the experiment happier than those who do not, in line with hypothesis 2. The right side of table 3 reports a similar regression, now run for the subjects in design NC. Here, winning the auction only has a weakly significant effect.¹⁸

Result 2. *Subjects who won the auction for personal punishment are happier than those who did not.*

5. Discussion

In an experiment designed to separate the decision to punish personally from the more general decision to punish, we find that many subjects bid positive amounts in a second price auction that auctions off the right to punish personally. Some of these subjects bid substantial amounts.

The experimental designs are constructed to eliminate a range of other effects, which might have an influence on subjects decisions in more general settings. Due to the one-shot nature of the experiment, it is not possible to use bids as a signalling device for future play. Furthermore, seats in the experiment were separated by blinds, so the act of punishing was hard to use to express disapproval as in Masclet, Noussair, Tucker, and Villeval (2003). Since punishment is the physical act of destroying (paper) money, it might be a worry that subjects like to destroy money. However, the results of our questionnaire let us discard that thought.¹⁹ The act of destroying the envelope is a punishment of subject *B*, not money burning as in Zizzo (2003), where no strategic component was involved. Most importantly, the bids in the auction, and thus the willingness to pay for personal punishment, have no influence on the payoff of the offending subject *B*. Subject *B*'s payoff is completely determined in stages

¹⁸Obviously, subjects in NC did not see allocations and did not decide on conducting the auction either.

¹⁹The final questionnaire included the question "Do you like destroying money?". Not one of the subjects answered with yes. Additionally, subjects were given the opportunity to destroy some of their own remaining money during the final questionnaire. Again, none took this opportunity.

1 to 3. One of the mandatory test questions covered this point to make it clear to every subject. Our decision to use a second price sealed bid auction stems from the previous considerations. It is a fast and incentive compatible method that lets us elicit a very fine grained willingness to pay for personal punishment. Since the auction always has a winner, it emphasizes the point that punishment will always occur, regardless of the bids of subjects A .

Using an auction might introduce a motivation to bid due to a “desire to win”. Van den Bos, Li, Lau, Maskin, Cohen, Montague, and McClure (2008) find evidence for this in a sealed bid first price auction. In one of their treatments, the opponents are other human subjects (similar to our NC design), while in two other treatments, subjects bid against computerized agents. Furthermore, all subjects are taught to calculate the (risk-neutral) Nash-equilibrium strategy, to rule out a winner’s curse effect stemming from limited cognitive ability. They find that subjects playing against humans overbid significantly more often than those playing against computers. There is also evidence from a fMRI experiment by Delgado, Schotter, Ozbay, and Phelps (2008) who compare subjects’ reactions to losing a lottery versus losing an auction to conclude that “The fear of losing the social competition inherent in an auction may lead people to pay too high a price for the good for sale”. It is possible that, in a similar vein, our subjects did not want to “lose” the auction and therefore bid positive amounts. Our results in NC can be seen as further evidence for such an effect. However, in 2A, we directly compare the results of two auctions. If a desire to win exists, it should influence both auctions in a similar way, yet we find a significant difference between the two.

We further find that subjects who win the personal punishment auction are becoming happier during the experiment compared to those who do not win. A similar result for the dummy auction is only weakly significant. While we can not exclude the possibility that subjects happiness is only due to winning the auction, the result is also consistent with subjects enjoying the personal punishment they achieved.

The personal punishment we address in this paper differs from antisocial punishment as in Herrmann, Thöni, and Gächter (2008), which is punishing people that behaved prosocially. In our case, when subjects B decided on the distribution, they (mostly) chose the unfair (2, 8)-split; they therefore do not behave prosocial. When we look for antisocial punishment in our data, we find that only 2 out of 9 subjects (22.2%), who were confronted with the fair or prosocial (10, 0)-split, voted for punishment.

Overall, the effects we observe are significant, but not huge. This is not surprising, since we exclude many other effects which would otherwise work in a similar direction. In many real life examples, the demand for punishment and the demand for personal punishment will be measured simultaneously. Addi-

tionally, the personal punishment, as Adam Smith describes it, is punishment for a grave offense. For obvious reasons, laboratory experiments can only implement minor offenses.

Yet modern justice systems might be one of the causes of unfulfilled demand for personal punishment. By moving all aspects of punishment into the hands of state employees and professionals, they remove part of the satisfaction from punishment on part of those who were done wrong. The many advantages of modern justice are obvious, but our paper might point out a hidden disadvantage.

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