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Competition-Induced Punishment of Winners and Losers: Who Is the Target?

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Abstract

We elicit punishment after competition. Our experiment creates a setting in which winners and losers are assigned in a pairwise speed-based calculation task. As in Abbink and Sadrieh’s (2009) joy-of-destruction game punishment is executed by burning parts of another participant’s endowment. We manipulate the target of punishment to investigate whether it is driven by discrimination of the direct opponent, the outgroup or by joy of destruction. Furthermore, we analyze the role that the clarity of victory or defeat plays for punishment after competition. Our findings suggest that losers face punishment from particularly dominant winners and — to a lesser degree — from particularly frustrated losers. Winners face undifferentiated punishment from all sides. Our results have implications for the prevention of destructive behavior within organizations which use competitions in order to induce effort.

Keywords: Competition, social comparison, winners, losers, joy of destruction, money burning.

PsycINFO Classification Code: 2360; 3020.

JEL-Classification: C72, C90, C91.

1 Introduction

People constantly face competition, in their career, in politics, science or arts. Whereas its effects of continuous performance enhancement are desired (Hayek 1982a, 68), the relative results of the process may be experienced as painful by the outperformed. Hayek (1982b, 71) points out that “[...] the
outcome [of competition] will be unpredictable and that there will be winners and losers. And while, as in a game, we are right in insisting that it be fair and that nobody cheat, it would be nonsensical to demand that the results for the different players be just.” Hayek does not consider outcome fairness a meaningful category, once we have agreed on the procedural fairness of competition. The outcome, however, may still lead to destructive behavior in the aftermath.

Critics have long acknowledged the negative effects of competition (see, e.g., Mead 1936 and Deutsch 1949). Most of them emphasized that competition can cause a paralyzing fear of losing, thus leading to lower productivity or that unfair means may be employed in order to win at any price. These means may even include aggression against others. In the Robbers Cave Experiment (Sherif et al. 1961) strong competition was induced between groups of children, which lead to attacks after the games and at night (Kohn 1992). Thus, competition may induce aggression towards the other “outside the arena”. Since competition necessarily produces positional results, this leads to the important question of whether winners and losers are more likely to be subjected to this expressive aggression. So far, this question has been largely neglected in the literature.

The effect of the competitive outcome on aggression is difficult to analyze. Since aggression in a competitive framework can be a factor of success, it is hard to disentangle to which extent aggression is inherent in competition or caused by it. Sabotage behavior, for instance, is an example of aggression which mainly aims to influence the propensity to win itself. To avoid this mixture of strategic and expressive motives, we elicit aggression after competition, thus ruling out all instrumental motives.

The key idea of our experiment is to induce competition in order to generate different statuses between subjects via outcomes. In competition, a subject’s status may not only be determined along Hayek’s dichotomy of winners and losers, but also in a more continuous way by means of score differences. Subsequently, we elicit punishment by the joy-of-destruction game (Abbink and Sadrieh 2009), where a subject can costlessly burn another participant’s endowment without any monetary advantage for herself. We manipulate the targets of punishment to investigate whether destructive behavior varies, if winners and losers face each other across or within groups. Ultimately, we want to find out if it is winners or losers, which are more severely endangered by destructive behavior caused by competition.

2 Previous Experiments and Theoretical Background

There is ample experimental evidence that declaring winners and losers in tournaments fosters constructive effort as well as sabotage behavior (see, e.g., Charness et al. 2014, Harbring and Irlenbusch 2011, Harbring and Irlenbusch 2008). Sabotage is defined as destructive behavior against a competitor in order to lower his chances of winning. In this sense, it is strategic. Strategic destructive behavior between opponents is also explored in the contest literature, where the option to costly punish the opponent is inherent in the contest (for an overview see Dechenaux et al. 2014). Competition law and rules of the game, courts and referees try to guarantee procedural fairness during competition. In our
experiment, we deliberately dismiss strategic aspects to study which punishment remains, when the outcome of the competition can not be influenced any longer. This is in contrast to the experimental studies on sabotage behavior and the contest literature where punishment is used instrumentally.

Destructive behavior of competitors where strategic motives are explicitly ruled out is rarely analyzed in the experimental literature. There exists some evidence that competition has an influence on players’ destructive behavior even after the competitive stage has ended in the context of video games (Adachi and Willoughby 2011). The effects of the competition outcome on destructive behavior were, however, not investigated. Muller et al. (2012) provide one of the few studies directly addressing the expressive destructive behavior of winners and losers. Notably, they find more pronounced aggression in winners than in losers. In their experiment, subjects performed inscrutable perception tasks. Each subject was attributed the same amount of points irrespective of actual performance. The winning or losing position was assigned to the subjects by matching them with an actually fictitious partner who had allegedly scored higher or lower. In a second round, subjects engaged in a reaction competition with the same presumed partner. If they won in this second round, they would get the chance to costlessly punish this presumed partner by administering her noise or hot sauce (see also Lieberman et al. 1999). The results show that winners from the first round were significantly more aggressive than losers from the first round. Behavior after competition is also addressed in some psychological studies with children. Nelson et al. (1969) find that 5 - 6 years old children which participate in competitive games were subsequently more aggressive than children who engage in non-competitive games, whereby losers were even more aggressive than winners which is in contrast to the findings of Muller et al. (2012).

In various other studies psychologists rather analyze the aggression of subjects with high or low status. These studies may still shed some light on the motives of winners’ and losers’ destructive behavior. Against the background of this research, Muller et al.’s findings may be surprising, since most studies tend to rationalize destructive behavior of low-status subjects. The role of low self-esteem is herein emphasized and a close causal connection between feelings of inferiority, frustration and aggression is stated (Dollard et al. 1939, Buss 1963, Berkowitz 1989). Priks (2010), for instance, looked at data from the Swedish hooligan scene and identified that fan violence is fostered by disappointed expectations in the supported team. This “frustration aggression hypothesis” has a long tradition in social psychology. Various studies explore the interaction effects of low self-esteem and narcissism on aggression. Donnellan et al. (2005), for instance, find a robust relationship between low self-esteem and the externalization of problems. Henry (2009) observes that low-status subjects tend to be aggressive in the face of an insult to protect their sense of social worth.

However, the frustration aggression hypothesis has recently been challenged. Bushman and Baumeister (1998) find no empirical evidence for the connection of aggression and low self-esteem but identify a link between aggression and narcissism. Similarly, Sivarajasingam et al. (2005) identify increased self-confidence as a driver of aggression, since evidence from Cardiff shows that more injuries happen after football matches ending in home victories.
But does destructive behavior after competition also occur in an incentivized setting? Abbink and Sadrieh (2009) isolate pure nasty behavior in the lab by excluding all possible other reasons for punishment, such as personal monetary gain. They find significant punishment of approximately 40% of all subjects when a random device, subjects could veil their decisions behind, was provided (“hidden treatment”). This rate is reduced to about 26%, if punishment is costly (Abbink and Herrmann 2011). Without such a “moral wiggle room”, however, the overall punishment level erodes to 10% and lower (“open treatment”). Dana et al. (2007) who coined the term also found subjects behaving more selfishly, if the consequences were obscured.

We investigate, if destructive behavior can be triggered without such a wiggle room solely by the effects of competition. As our interest focuses on the target groups of competition-induced punishment we naturally have to manipulate those targets, whereby group effects may come into play: According to the minimal group paradigm, a single common feature suffices to establish group identity (Tajfel and Turner 1986). There is ample evidence that subjects tend to favor ingroup members in contrast to outgroup members. Chen and Xin Li (2006), for example, find that participants are more likely to reward and less likely to punish ingroup members as opposed to outgroup members. Thus, we derive that the common fate of winning or losing in competition may establish group identities which lead to outgroup punishment which is not induced by competition itself. Hence, if we want to elicit punishment caused by competition, we do have to take group effects into account. Our design will capture these different potential triggers for punishment.

Ultimately, we want to understand whether there is a pattern underlying the punishment of winners and losers after competition. In particular, we are testing three potential predictions for such expressive punishment: discrimination of the direct opponent, discrimination along the winner-loser dichotomy as social identity theory would predict or joy of destruction. Additionally, we elicit whether the individual performance in the competition, expressed by the score difference, explains subjects’ behavior toward each other. In a second step, we examine how happiness is influenced by the exposure to competition as well as punishment and elicit participants’ external assessment of happiness. Thus, we aim to get a picture of the overall effects of competition on well-being.

3 Experiment Design

There are two players that may mutually punish each other. In line with an established procedure in the experimental literature, we measure punishment via money burning, i.e. the propensity to annihilate other subjects’ endowment without monetary advantage (Abbink and Sadrieh 2009, see also Zizzo and Oswald 2001 or Zizzo 2003). As done in these studies, we only give subjects the opportunity to destroy other people’s endowment without providing them with a symmetric alternative to create money for others. This accounts for the fact that our experiment is explicitly investigating treatment effects in expressive punishment behavior. In this sense, it is also analogous to the psychological studies to which we refer to, where subjects may unilaterally punish others by administering noise
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Furthermore, by exposing subjects to punishment only, we are able to provide subjects with a clear extrinsic incentive to win the competition. This will be explained in more detail below.

The experiment consists of two stages. Subjects are publicly informed about the course of the experiment before it starts. For the first stage, subjects are randomly matched to pairs and partake in a competition. The aim of this stage is to naturally induce the perception of winning and losing without having any direct effect on subjects’ payoffs. The first stage is therefore a prerequisite for our second stage, in which we elicit subjects’ punishment choices and consequently the damage that winners and losers receive. Before the second stage, subjects either remain with their matching partner (opponent) from the first stage or are rematched with another subject. In case of rematching, common knowledge is established that the matching procedure excludes the possibility that subjects face their partner from the first stage again by coincidence (perfect stranger matching).

We employ three treatments characterized along two classes of conditions. The first class of conditions discriminates between subjects facing a partner or a stranger in the second stage. The second class of conditions discriminates between subjects which may punish outgroup members, that is, winners which are matched with losers and vice versa, and subjects which may punish ingroup members. Note that if subjects are matched with an ingroup member, this cannot be a partner, since the competition necessarily produces one winner and one loser. Therefore, former competitors can never be in the same group. Table 1 summarizes the two classes of conditions and the three emerging treatments to which subjects are randomly assigned.

Place Table 1 about here.

The competition in the first stage of the experiment is a speed-based calculation task. Each pair of subjects is confronted with a series of 19 matrices. Each of these matrices consists of 16 cells containing one-digit numbers with one decimal. There are two pairs of numbers in each matrix that add exactly up to 10. Subjects are called upon to identify and click one of these two pairs. The choice of the faster subject is decisive. If she chooses correctly, she scores one point. If she chooses incorrectly, her slower opponent scores one point. If for a given matrix, none of the two subjects clicks on a pair of numbers, the round ends after 45 seconds without a point allocated and the next matrix is presented. After all 19 rounds are finished, the total score determines the winner and the loser. Subjects are informed that a random device determines winner and loser with equal chances in case of a draw. Afterwards, winners and losers are appointed.

Before the beginning of the second stage, subjects either remain with their partner from the competition (Outgroup Partner Treatment) or are rematched with a stranger. If the latter is the case, winners are either rematched with a loser who they have not faced in the first stage (Outgroup Stranger Treatment) or with another winner (Ingroup Stranger Treatment). The same procedure applies to losers.

During the entire second stage, each subject within a pair sees the counterpart’s identification letter, while scores are displayed on top of the screen. Subjects are then endowed with 100 ECU
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(10 ECU = 70 Euro Cents) and are getting the opportunity to reduce each others' endowment in integers down to 0 ECU by clicking plus and minus buttons. Subjects are again sensitized that a reduction of their counterpart's endowment has no effect on their own income. In order to collect more observations, subjects make their punishment choices simultaneously and are subsequently informed about their counterpart's choice.

To give subjects a monetary incentive to win, both punishment choices are implemented with different chances for winners and losers. Winners get hit by the punishment choice of their counterpart with a probability of 40%, while losers get hit with 60% probability. By exposing winners to a lower probability, we safeguard against subjects deliberately trying to lose if they fear a loser's revenge. Since the counterpart can at best spare a subject by abstaining from punishment, a lower probability is equal to a lower risk of getting one's endowment reduced. Both random draws are made independently. Thus, for each pair, none, one or both of the choices are implemented. Before the random draws determining the implementation of the punishment choices are made, subjects answer a questionnaire. Eventually, subjects are informed about the results of the random draws and of their own as well as their counterpart's payment. They are then privately paid a flat show-up fee of 3.00 Euros and their additional earnings and are leaving the laboratory.

By means of the different treatments and the score differences, we want to understand the patterns underlying subjects' punishment behavior caused by competition. If punishment functions as an expressive act of blind destruction, neither the manipulation of the treatments nor the score difference between perpetrator and target should alter its level. If subjects think in categories of outgroup and ingroup, a significant difference in punishment levels between both conditions should occur, whereas score differences should not be decisive. If however, the score difference turns out to be a predictor for subjects' punishment, subjects take the clarity of their victory or defeat as a more precise measure of their status into account. In this case, punishment patterns are driven by the idiosyncratic outcomes of the manifold competitions rather than by the binary labels that always stand at the end.

4 Experiment Results

4.1 Procedure of the Experiment

Subjects were recruited via ORSEE (Greiner 2004). The experiment took place in January and February 2014 at the Experimental Ethics Laboratory of the Technical University of Munich, Germany. Subjects were mainly students from various disciplines. In total, 218 subjects participated. Seventy subjects were assigned to the Outgroup Partner Treatment, 68 were assigned to the Outgroup Stranger Treatment, while 80 were assigned to the Ingroup Stranger Treatment.

After entering the lab subjects first read the instructions in private and therefore received complete information about the course of the experiment. The instructions were then read out loud to establish

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1Note that we later compare the punishment levels to which winners and losers are exposed between treatments. Therefore, the probability by which the respective group is hit by a counterpart's choice is kept constant for any given group.
common knowledge. The experiment was browser based and programmed with Python 2.7 using web sockets to assure absolute simultaneity in the competition part. Including payment procedure, an experimental session lasted for approximately 45 minutes.

Data on reaction times and failure rates demonstrate that subjects took the competition serious. When being presented with a matrix, the faster of the two competitors took on average 9.48 seconds to select a pair of numbers. A time out after 45 seconds occurred in only 18 of the 2,071 matrix challenges (0.87 %) that subject pairs faced altogether. If a solution was submitted, it was correct in 1,846 of the 2,053 cases (89.92 %), indicating that subjects did not simply click to end the experiment as soon as possible.²

### 4.2 Outgroup Partner and Outgroup Stranger Punishment

We first check whether received punishment after competition is predominant if one is punished by her direct opponent. We therefore start our analysis by comparing the Outgroup Partner Treatment with the Outgroup Stranger Treatment. If punishment was more pronounced in the Outgroup Partner Treatment than in the Outgroup Stranger Treatment, we would conclude that punishment mainly occurs, because the competition with a particular subject is carried to the subsequent round. Here it canalizes as punishment only against this particular subject. Social identity theory suggests that this post-competition punishment may emanate to other members of the outgroup. This is due to the idea that the outcome of the competition constitutes identities of winners and losers who perceive to share a common fate.

By comparing Outgroup Partner and Outgroup Stranger Treatment, we keep the Outgroup Condition constant, and check whether it makes a difference, if subjects are to be punished by their direct opponent from the past competition (Partner Condition) or with another subject from the outgroup (Stranger Condition). In the Outgroup Partner Treatment, no rematching took place after the competition stage and subjects were to punish their matching partner from the competition. In the Outgroup Stranger Treatment, winners were rematched with a loser who had been defeated by someone else in the competition and vice versa.

In the Outgroup Partner Treatment, 28 of 70 subjects (40 %) were punished. Of this subgroup 13 were winners and 15 were losers. On average, 20.11 ECU ($sd = 34.37$ ECU) of the 100 ECU endowment of each subject were burned. The average punishment that winners received were 20.91 ECU ($sd = 37.66$ ECU), the average punishment of losers were 19.31 ECU ($sd = 31.28$ ECU). Note that this is about the level of punishment that Abbink and Sadrieh (2009) observe in their hidden treatment, where subjects could veil their choice to punish behind a random punishment device. In their open treatment, where this was not possible, they did not observe significant punishment. Therefore, it seems that competition is able to induce significant amounts of punishment even in a setting where intentions to punish could not be concealed.

In the Outgroup Stranger Treatment, 33 of 68 subjects (48.53 %) were punished. Of these 33

²Another indicator of how serious subjects took the competition is the effect that its outcome has on subjects’ happiness. Respective evidence will be presented in paragraph 3.4.
subjects, 14 were winners and 19 were losers. The average punishment in this treatment amounts to 20.09 ECU ($sd = 33.51 ECU$). This is not significantly different from the punishment level in the Outgroup Partner Treatment ($p = 0.503$). Winners are on average punished by 15.50 ECU ($sd = 30.19 ECU$), while losers’ are punished by 24.68 ECU ($sd = 36.39 ECU$). If we compare the punishment levels differentiated by groups, we find as well they do not significantly differ from the ones in the Outgroup Partner Treatment for winners ($p = 0.978$) and losers ($p = 0.381$).

Rematching losers with winners they had not competed against does therefore not significantly alter the punishment of any of the two groups. This constitutes our first result.

**Result 1.** Winners and losers are punished by outgroup strangers to a similar extent as they are punished by their direct opponents.

Therefore, it turns out that punishment levels can not be explained by personal feud between direct opponents, since punishment persists if subjects are rematched with an outgroup stranger after competition.

If outgroup discrimination or joy of destruction are the main predictors for punishment, we should not observe any influence exercised by point differences. Thus, to further understand the patterns predicting punishment suffered by winners and losers, we analyze whether the clarity of victory or defeat explains punishment choices. Since punishment levels in the two treatments of the Outgroup Condition did not significantly differ, we pool the data for the Outgroup Condition to receive more statistical power.

The regressions in Tables 2 and 3 analyze the influence that score differences ($\delta\text{Score}$) have on the punishment level received by losers and winners, respectively. Gender and risk aversion ($\text{Risk}$) serve as control variables. It turns out the score difference only exerts a significant effect on the punishment that losers receive from winners: Losers are punished more severely by winners who won more clearly. Contrary to that, winners are not punished any different by losers who lost more clearly or more narrowly.

**Result 2.** Losers get punished more severely with winners’ increasing score differences. Winners’ punishment by losers, however is not predicted by score differences.

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3 All p-values we report in this section are the results of two-sided Mann-Whitney U-tests.
4 For all treatments, the score difference is calculated as the difference between the respective subject’s total score minus the total score of her opponent in the competition. Thus, the score difference is negative for losers and positive for winners. Since the score difference is based on performance in the competitive stage, it is not influenced by rematching.
5 Measures alternative to the score differences of the competing pair could have been the score difference between the newly matched pair and the absolute score of a player. In the Outgroup Stranger Treatment, the score difference between the newly matched pair could theoretically be such that the winner of the pair actually had a lower score than the loser of this pair. Similarly, the absolute score of a winner could have been lower than the absolute score of a loser. Note that both could have only been caused by tied matrices. As mentioned above, however, less than 1 % of matrices were tied. Thus, this phenomenon played no role empirically. There is a very high correlation between score differences of competing pairs and of newly matched pairs ($r = 0.898$) as well as between score differences of competing pairs and absolute scores ($r = 0.985$). Consequently, both alternative measures also constitute predictors of punishment at the 5 % significance level.
As far as the punishment of losers by winners is concerned, neither joy of destruction, nor social identity theory provide an adequate explanation. For the attachment of this label, the clarity of the outcome is irrelevant. This is since we understand social identity as the application of the binary label of being the loser or the winner. Pure outgroup discrimination would then drive a loser’s punishment by the winner. The data reveals though that the punishment losers receive correlates with the clarity of their perpetrators’ victory: the clearer they won, the harder the punishment the loser faces by the winner.

The punishment that winners receive, on the other hand does not depend on score differences: a winner is punished irrespectively of the fact that the punishing loser was humiliated by a particularly clear defeat or that she lost rather narrowly. Therefore, the punishment that winners suffer by losers may be explained by social identity theory at this point. In this case, however, we should observe that punishment erodes, if winners are punished by their own peers.

### 4.3 Outgroup Stranger and Ingroup Stranger Punishment

In the following, we compare the Outgroup Stranger Treatment with the Ingroup Stranger Treatment, thus keeping the Stranger Condition constant. We therefore check if — given that subjects encounter a stranger after competition — it matters whether she is a member of the outgroup or of the ingroup. Remember that in the Ingroup Treatment, winners are rematched with other winners, while losers are rematched with other losers after the competition and receive the option to punish them.

In the Ingroup Stranger Treatment, 28 of 80 subjects were punished (35%). The average punishment was 14.28 ECU ($sd = 28.85$ ECU). At an aggregate level, we find that the level of punishment that subjects receive in the Ingroup Treatment is not significantly different from the one in the Outgroup Stranger Treatment ($p = 0.110$). We now go on to check whether the overall insignificance between the Outgroup Stranger Treatment and the Ingroup Stranger Treatment also holds for winners and losers separately.

Losers are punished on average by 11.00 ECU ($sd = 23.62$ ECU) by other losers, while winners were punished by 17.55 ECU ($sd = 33.26$ ECU) by other winners. We now compare the levels of ingroup punishment that losers and winners receive to the respective levels of suffered outgroup punishment reported in the previous paragraph. Concerning the erosion of punishment from the Outgroup to the Ingroup Condition, this comparison constitutes a differentiated finding. Losers’ punishment by other ingroup members, on the other hand, does not significantly differ from their
punishment by losers \( (p = 0.956) \). These findings are illustrated in Figure 1. This leads to our third result.

**Result 3.** Losers are punished less severely by ingroup than by outgroup members. Winners are punished similarly by ingroup as by outgroup members.

It turns out, the level of punishment received in the Ingroup as compared to the Outgroup Condition erodes for losers. We therefore find that losers have to fear their peers less than winners, since substantially smaller parts of their endowment are destroyed, if they are confronted with another loser in the second stage. As outlined in the previous paragraph, this finding cannot be explained by mere outgroup discrimination, since losers were not lumped together but rather punished depending on the clarity of the perpetrator’s victory.

For winners, on the other hand, it does not matter who they face after competition. They are punished as severely by ingroup members as they are punished by losers. Although we found blanket punishment of winners by losers, irrespective of the clarity of the perpetrator’s defeat, we cannot identify any outgroup discrimination. Hence, social identity theory is also no adequate explanation for the punishment received by winners, since we would then expect an erosion of the punishment they suffer from ingroup as compared to outgroup members.

The regressions in Tables 4 and 5 address to which extent score differences influence punishment in the Ingroup Condition. They reveal that losers are punished more severely by ingroup members with increasing score differences. The punishment that winners suffer from their peers, on the other hand, is irrespective of score difference.

**Result 4.** Losers punish ingroup members more severely with increasing score differences. Score differences, however, do not determine winners’ ingroup punishment.

This finding completes our picture. The overall level of losers’ ingroup punishment is relatively modest and losers are punished by their own peers, if the perpetrator lost the competition very clearly. This is in contrast to winners’ ingroup punishment which remains on a high level and is exercised completely irrespective of the perpetrators clarity of victory.

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6 Note that if outgroup partners are included in the analysis, the finding that losers are punished less severely by ingroup members than by winners is not altered \( (p = 0.041) \). Also in line with the findings above, there is no statistical difference in the punishment of winners by the ingroup and by the outgroup \( (p = 0.939) \).

7 It turns out that losing men punish other losers more severely than losing women do and more risk averse losers punish harder than less risk averse ones.

8 As in the Outgroup Condition (see footnote 5), the score difference of the competing pair is very highly correlated with the absolute score of a player \( (r = 0.989) \). Score differences between the newly matched pair tend to be low, since both players are winners or losers, respectively. Robustness checks confirm that this alternative score difference is a significant predictor of punishment for losers at the 10% level \( (p = 0.067) \), but an insignificant predictor for winners \( (p = 0.924) \).
4.4 Defeat or Punishment: Which Hurts More?

As a final step of our analysis, we were interested in whether subjects’ happiness is influenced more strongly by the outcome of competition or by the level of punishment which one receives. Furthermore, we wanted to know whether the respective influence is anticipated when subjects have to attribute happiness to others. We therefore asked each subject in our post-experimental questionnaire to state their agreement or disagreement with happiness statements referring to themselves (“I feel fine right now”) and to their counterpart (“I expect my counterpart to feel fine right now”). Agreement or disagreement could be expressed on a Likert scale from 1 (“fully agree”) to 7 (“don’t agree at all”). Thus, higher values represent a lower level of self-assessed or attributed happiness.

The post-experimental questionnaire had to be answered right before subjects were informed about the result of the random draw which would decide whether a given punishment choice of their counterpart would be implemented. Remember that this was the case with a probability of 60 % for losers, and with a probability of 40 % for winners. Crucially, of course, subjects did know their counterparts punishment choice when answering the questionnaire.

The regressions in Tables 6 and 7 analyze the influence that score difference ($\delta \text{Score}$) and the level of punishment have on subjects’ self-assessed or attributed happiness. Furthermore, we control for the influence of the binary variables competition outcome (losing or winning) and the condition (Outgroup or Ingroup) as well as several interaction effects.

Place Table 6 about here.

Place Table 7 about here.

Self-assessed happiness is well predicted by the score difference, i.e., the clarity of victory or defeat that subjects experience in the competition. This difference is negative, if subjects were defeated and positive, if they were victorious. The more clearly subjects were defeated, the less happy they are. The more clearly they won, the happier they are. As the interaction effect of score difference and outcome shows, this effect is even stronger for winners. These findings corroborate our statement from the beginning of this chapter that subjects took the competition serious and drew an intrinsic benefit from succeeding in it. The level of punishment is another variable which influences subjects’ happiness. The more they are punished, the less happy they are.

The described influences on happiness are not well anticipated by subjects as the analysis of attributed happiness shows. The clarity of victory or defeat is not seen as a predictor of happiness at all, although it actually has a strong effect. Subjects rather reckoned that the outcome alone (having lost or won) would determine people’s happiness. The effect, on the other hand, that the level of punishment has on subjects’ happiness is overestimated by a factor of three.

Individual performance in the competition exercises a significant influence on subjects’ happiness. It is a much better predictor than the mere binary outcome and the labels of loser and winner that are accordingly attached to subjects. As it seems, the dominance one exercises in competition is
even a stronger driver of happiness than the level of received punishment. This is interesting, since only the latter can have monetary consequences. Apparently subjects have difficulties to empathize with others, since they do not anticipate this pattern: they underestimate the effect of competitive performance, while overestimating the effect that punishment has on happiness.

5 Discussion

Competition divides subjects into two groups, the successful and the defeated ones. After such a procedure we find significant destructive behavior toward other subjects even if intentions are obvious. Abbink and Sadrieh (2009), in whose joy-of-destruction game competition was absent, had to provide subjects the opportunity to veil their intentions in order to induce significant money burning. Therefore, we identify competition as a trigger for punishment. Our main results show, however, that winners and losers are treated differently. Losers are punished more by winners than by other losers, indicating that losers show sympathy for their peers. This means that the outdistanced ones may not expect much sympathy from the ones who outperformed them, but may experience solidarity from their peers. Winners, on the other hand, are punished equally by losers as by other winners, indicating there is no feeling of solidarity between winners at all.

Pinker (2011, 519-20) argues that “[p]erhaps the most extraordinary popular delusion about violence of the past quarter-century is that it is caused by low self-esteem.” As a result, he says, it has inspired school programs and a “Task Force to Promote Self-Esteem”. Winning fosters higher self esteem than losing. Although our experiment provides evidence for destructive behavior within both losers and winners, we indeed identify a tendency that winners’ destructive behavior is even more pronounced than losers’.

Our data provide further evidence against the frustration aggression hypothesis, Bushman and Baumeister (1998) started to attack, when claiming the hypothesis had become “conventional view” despite lacking laboratory proof. This experiment provides another challenge for the hypothesis. One could even argue that eradicating the cliché of the desperate loser turning violent against his tormentors is of utmost importance not only because it fails to mirror reality, but has also lead to dangerous misinterpretations of social conflicts to the present day — be it in individual relationships, domestic or interstate conflicts. Analyzing a certain act of violence would then no longer be concentrated so much on the search for past reasons the perpetrator to strike back in revenge, but rather investigate the structures which enabled the perpetrator gather that much power he then could violently exercise over others. Generally, our data suggest the picture of a happy but reckless winner feeling entitled to exercise his dominance by causing harm to whoever he encounters. This is clearly in contrast to the frustration aggression hypothesis.

If strategies of prevention are already heavily focused on the ones worse off, we have good reasons to turn our attention toward the ones better off. This could be the schoolchild winning a musical or sports contest, the student with best marks at university or the colleague who just received promotion.
But winners are not only the neglected perpetrators of destructive behavior. While losers mainly face suppression from the ones better off, winners are taken in crossfire by losers and their own peers. The successful ones remain under attack by their peers and are subjected to retaliatory offenses by losers. These observations may also be explained by the mere labeling of subjects as “winner” and “loser” which would have been caused by any alternative procedure to attach these labels. So what exactly is the role of competition here?

Based on our findings, personal feud between competitors disqualifies as an adequate explanation for post-competition punishment, as punishment persists unbrokenly in the Outgroup Stranger Treatment. Group identity mechanisms can be refuted as well, since we identify substantial ingroup punishment. A more differentiated glance at the data shows that the observed behavior cannot be fully explained by the dichotomy of winners and losers alone. The clear effect that score difference has on subjects’ punishment behavior supports our claim that expressive aggression is triggered by the very process of competition rather than by the attachment of the labels of “winner” and “loser”.

This becomes vital in the context of especially drastic competition in organizations: Yahoo CEO Marissa Mayer was recently criticized for following Jack Welch’s approach to force managers to rank their subordinates on a bell curve and to discharge the ones at the low tail (see, e.g., Brunstein 2013). This poses the risk that the adopted competitive mindset leads to destructive eruptions after the process, endangering joint company resources. While the inclination to outperform others represents an involvement ultimately bearing a potential for organizations, managers should therefore not only assure fairness during intense phases of competition but also take respective measures in the aftermath. These may be rather formal measures as the employment of mediators or informal ones as the initiation of rituals. Organizational performance enhancement through competition could orientate itself on football team management. Inevitably and intendedly, players constantly compete for permanent places, but it is still crucial to make them function as a team in order to be successful.

Moreover, it turns out that performance in the competition is an even stronger driver of subjects’ happiness than the level of punishment which one suffers, although only the latter has monetary consequences in our experiment. Thus, subjects react sensitively to the fine-tuned status feedback that is shown by the performance measure of score differences. The strength of this effect is not anticipated by subjects at all. On the contrary, they drastically overestimate the effect their punishment has on other subjects in terms of happiness.

6 Conclusions

Competition is a desired means to produce positional results, also within organizations. Even if the competition itself is sabotage proof, however subjects engage in destructive behavior after competition, that is aggression caused by competition, to a substantial extent. Notably, this is not only the case for the frustrated outdistanced ones but also for the ones who have outperformed the others and who attest themselves high levels of happiness. We therefore observe that the well-documented
phenomenon of sabotage is carried further to the non-strategic post-competitive stage. Apparently it is naive to assume that the mode of competitiveness and the wish to outperform others is switched off after the blow of the referee’s whistle at the end of the game, since competition seems to increase the overall level of aggression.

We believe that this paper provides fundamental insights on destructive behavior caused by competition that is relevant for policy makers within organizations. Rules and checks must be in place not only to sanction sabotage behavior during a competition, e.g. between colleagues for a promotion, but also after the outcome has become apparent and the competition is — at least for this time — over. Furthermore, in social life often after competition is before competition. Anticipating future competitive situations could thus intensify the punishment of opponents. In particular, implications from our study may be drawn by paying special attention to the members of the organization which succeeded in competition. Most of us would probably tend to keep an eye on the members of the organization who missed a promotion or a bonus. However, it may be the outperformers which aggress against other outperformers as well as underperformers equally. To suggest institutional solutions to tackle the issue, a deeper understanding of the mechanisms of expressive punishment that winners and losers impose on each other is required. This asks for further research.

In line with the original joy-of-destruction game, punishment was costless in our design, since the aim of our study was to compare the aggression towards winners and losers in the simplest setting possible. We know, however, that imposing costs on punishment reduces punishment rates (Abbink and Herrmann 2011). Future research should investigate to which extent expressive punishment after competition is sensitive to costs. For instance, it may be interesting to investigate whether small deterministic costs or higher stochastic costs are more effective to prevent punishment.

Fast et al. (2011) find evidence from the lab that power without status is particularly destructive. This finding, however, has not been analyzed in a competitive setting. It is important to investigate the interaction of power and social position in their influence on destructive behavior after competition. To mitigate competition-induced punishment, it could be interesting to explore which institutions would emerge, if subjects had the chance to self-impose a set of rules. Finally, it should be noted that we found evidence for the process of competition itself fostering destructive behavior. But it is yet to examine to which extent other mechanisms that generate positional results may induce money burning.

References


Appendix: Instructions

Welcome to this experiment and thank you very much for your participation!

At the beginning of the experiment every participant is assigned a letter from A to X. Every letter is assigned only once, participants keep their letters until the ending of the experiment. Letters are allocated randomly and remain anonymous.

This experiment consists of two parts. The first part consists of 19 calculation tasks, which you have to play out against another participant from this room. This participant is randomly assigned to you. In each round you are presented with a matrix. Every matrix consists of 16 cells. In each
cell, there is a one-digit number with one decimal place. Per matrix there are exactly two pairs of
two numbers which add up to 10. All participants receive the same matrices in identical order. In each
matrix presented, you have to click on ONE of the two pairs which add up to 10.

The participant, who is assigned to you, gets to see the same matrix simultaneously. He, too, has
to find one pair as fast as possible. As soon as the faster one has marked two cells, the slower one
can not click on the cells any longer and the round is over. If the chosen pair of numbers is right, the
faster one scores. If the faster one chooses a wrong combination, the slower one scores. The scores of
you and the participant assigned to you, remain displayed on top of the screen and constantly adopt
to the state of play.

If one round is finished, after three seconds you are presented with the next matrix until all 19
rounds are completed. In case you or the other participant do not click on any cells at all, there is
a time-out after 45 seconds and the next matrix is presented. In case of a draw after 19 rounds, a
drawing of lots with equal probabilities decides who the winner and who the loser is. Both scores are
displayed on top of the screen. The first part is then completed.

In the second part of the experiment, each participant is financially endowed with 100 ECU (Ex-
perimental Currency Units). This endowment can be altered during the experiment. At the ending of
the experiment your gainings are converted into Euros and disbursed to you in private. The exchange
rate is as follows: 10 ECU = 70 Eurocents.

[For Treatment A, participants read the following:]

For the second part of the experiment each participant remains assigned to the participant, he
played against in the first part.

[For Treatment B, participants read the following:]

For the second part of the experiment, participants are re-matched. If you have won in the first
part, you are randomly matched with a counterpart who has lost. If you have lost in the first part,
you are randomly matched with a counterpart who has won. It is excluded that you are re-matched
with your partner from the first part.

[For Treatment C, participants read the following:]

For the second part of the experiment, participants are re-matched. If you won in the first part,
you would be randomly matched with a counterpart who has won as well. If you lost in the first part,
you would be randomly matched with a counterpart who has lost as well.

(The rest of the instructions are again the same for Treatments A, B and C.)

Both participants simultaneously get the opportunity to reduce their counterpart’s endowment of 100 ECU by any integer amount down to a minimum of 0 ECU. This reduction does not influence their own endowment. Likewise each participant can leave the counterpart’s endowment unchanged. The possible reductions of the endowment by the assigned participant come into effect with different probabilities for winners and loser from the first part of the experiment:

Place Figure 2 here.

As you can see, there are 4 black and 6 white balls in the winner’s urn. In the loser’s urn the condition is reversed: Herein contained are 6 black and only 4 white balls.

In case a black ball is drawn from a participant’s urn, he gets hit by the decision of his counterpart. His endowment is then reduced or left untouched according to the decision of the counterpart. If, however, a white ball is drawn, the decision of the counterpart is ignored. Consequently the participant’s endowment is left untouched irrespective of the decision of the counterpart.

Winners bear a risk of 40 % to be hit by the counterpart’s decision. Losers bear a risk of 60 % to be hit by the counterpart’s decision. The drawings from both urns take place simultaneously. Hence both, one or no decision can come into effect.

Subsequently both participants receive their pay-off in Euro according to the decision of their counterpart and the result of the drawing from the urn. You will receive the individual pieces of information that are relevant to your decisions again during the experiment.

If you completed reading and understood the instructions, please confirm by clicking on the accordant button on your screen. The instructions are then read out aloud once more. If you have any questions, please stand at your place and raise your hand.
Tables
Table 1: Experimental Treatments

<table>
<thead>
<tr>
<th>Condition</th>
<th>Partner Condition</th>
<th>Stranger Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outgroup</strong></td>
<td>Outgroup Partner</td>
<td>Outgroup Stranger</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>Treatment</td>
<td>Treatment</td>
</tr>
<tr>
<td><strong>Ingroup</strong></td>
<td></td>
<td>Inggroup Stranger</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td></td>
<td>Treatment</td>
</tr>
</tbody>
</table>
Table 2: OLS Regression on Punishment Received by Losers in Outgroup Condition

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>p value$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>16.902</td>
<td>7.715</td>
<td>0.032**</td>
</tr>
<tr>
<td>δScore</td>
<td>1.915</td>
<td>0.861</td>
<td>0.030**</td>
</tr>
<tr>
<td>Gender$^a$</td>
<td>-13.753</td>
<td>9.678</td>
<td>0.160</td>
</tr>
<tr>
<td>Risk</td>
<td>-0.061</td>
<td>0.165</td>
<td>0.710</td>
</tr>
</tbody>
</table>

Number of observations = 69

$^a$ 0 = male, 1 = female

$^b$ *, **, *** indicate significance at 10%, 5%, and 1%, respectively
### Table 3: OLS Regression on Punishment Received by Winners in Outgroup Condition

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>p value$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>21.942</td>
<td>8.048</td>
<td>0.008***</td>
</tr>
<tr>
<td>$\delta$Score</td>
<td>0.784</td>
<td>0.908</td>
<td>0.391</td>
</tr>
<tr>
<td>Gender$^a$</td>
<td>-3.313</td>
<td>9.734</td>
<td>0.735</td>
</tr>
<tr>
<td>Risk</td>
<td>-0.045</td>
<td>0.158</td>
<td>0.776</td>
</tr>
</tbody>
</table>

Number of observations = 69

$^a$ 0 = male, 1 = female

$^b$ *, **, *** indicate significance at 10%, 5%, and 1%, respectively
Table 4: OLS Regression on Punishment Received by Losers in Ingroup Condition

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>p value$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-8.972</td>
<td>6.921</td>
<td>0.203</td>
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<tr>
<td>$\delta$Score</td>
<td>-1.638</td>
<td>0.732</td>
<td>0.032**</td>
</tr>
<tr>
<td>Gender$^a$</td>
<td>-14.018</td>
<td>6.863</td>
<td>0.048**</td>
</tr>
<tr>
<td>Risk</td>
<td>0.479</td>
<td>0.123</td>
<td>0.000***</td>
</tr>
</tbody>
</table>

Number of observations = 40

$^a$ 0 = male, 1 = female

$^b$ *, **, *** indicate significance at 10%, 5%, and 1%, respectively
Table 5: OLS Regression on Punishment Received by Winners in Ingroup Condition

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>p value$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>7.281</td>
<td>11.442</td>
<td>0.529</td>
</tr>
<tr>
<td>δScore</td>
<td>0.492</td>
<td>1.216</td>
<td>0.688</td>
</tr>
<tr>
<td>Gender$^a$</td>
<td>13.670</td>
<td>12.158</td>
<td>0.268</td>
</tr>
<tr>
<td>Risk</td>
<td>0.086</td>
<td>0.189</td>
<td>0.652</td>
</tr>
</tbody>
</table>

Number of observations = 40

$^a$ 0 = male, 1 = female

$^b$ *, **, *** indicate significance at 10%, 5%, and 1%, respectively
Table 6: OLS Regression on Self-Assessment of Happiness

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.538</td>
<td>0.279</td>
<td>0.000***</td>
</tr>
<tr>
<td>δScore</td>
<td>-0.156</td>
<td>0.037</td>
<td>0.000***</td>
</tr>
<tr>
<td>Punishment</td>
<td>0.012</td>
<td>0.005</td>
<td>0.025**</td>
</tr>
<tr>
<td>Outcome(^a)</td>
<td>-0.161</td>
<td>0.395</td>
<td>0.684</td>
</tr>
<tr>
<td>Condition(^b)</td>
<td>-0.094</td>
<td>0.487</td>
<td>0.847</td>
</tr>
<tr>
<td>δScore × Outcome</td>
<td>0.134</td>
<td>0.053</td>
<td>0.012**</td>
</tr>
<tr>
<td>Punishment × Outcome</td>
<td>-0.007</td>
<td>0.007</td>
<td>0.346</td>
</tr>
<tr>
<td>δScore × Condition</td>
<td>0.019</td>
<td>0.064</td>
<td>0.765</td>
</tr>
<tr>
<td>Punishment × Condition</td>
<td>0.007</td>
<td>0.011</td>
<td>0.509</td>
</tr>
<tr>
<td>Outcome × Condition</td>
<td>-0.084</td>
<td>0.687</td>
<td>0.903</td>
</tr>
<tr>
<td>δScore × Outcome × Condition</td>
<td>0.028</td>
<td>0.090</td>
<td>0.756</td>
</tr>
<tr>
<td>Punishment × Outcome × Condition</td>
<td>0.004</td>
<td>0.014</td>
<td>0.792</td>
</tr>
</tbody>
</table>

\(^a\) 0 = Loser, 1 = Winner  
\(^b\) 0 = Outgroup, 1 = Ingroup  
\(^c\) *, **, *** indicate significance at 10%, 5%, and 1%, respectively
Table 7: OLS Regression on External Assessment of Happiness

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>p value&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.296</td>
<td>0.289</td>
<td>0.000***</td>
</tr>
<tr>
<td>δScore</td>
<td>-0.038</td>
<td>0.038</td>
<td>0.322</td>
</tr>
<tr>
<td>Punishment</td>
<td>0.038</td>
<td>0.005</td>
<td>0.000***</td>
</tr>
<tr>
<td>Outcome&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.560</td>
<td>0.407</td>
<td>0.000***</td>
</tr>
<tr>
<td>Condition&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0.566</td>
<td>0.508</td>
<td>0.266</td>
</tr>
<tr>
<td>δScore×Outcome</td>
<td>-0.066</td>
<td>0.054</td>
<td>0.224</td>
</tr>
<tr>
<td>Punishment×Outcome</td>
<td>-0.009</td>
<td>0.007</td>
<td>0.221</td>
</tr>
<tr>
<td>δScore×Condition</td>
<td>-0.008</td>
<td>0.065</td>
<td>0.899</td>
</tr>
<tr>
<td>Punishment×Condition</td>
<td>0.012</td>
<td>0.011</td>
<td>0.290</td>
</tr>
<tr>
<td>Outcome×Condition</td>
<td>1.215</td>
<td>0.709</td>
<td>0.088*</td>
</tr>
<tr>
<td>δScore×Outcome×Condition</td>
<td>0.005</td>
<td>0.093</td>
<td>0.955</td>
</tr>
<tr>
<td>Punishment×Outcome×Condition</td>
<td>-0.004</td>
<td>0.014</td>
<td>0.786</td>
</tr>
</tbody>
</table>

<sup>a</sup> 0 = Loser, 1 = Winner
<sup>b</sup> 0 = Outgroup, 1 = Ingroup
<sup>c</sup> *, **, *** indicate significance at 10%, 5%, and 1%, respectively