

FAIRNESS AND SHAME IN THE POWER TO TAKE

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ABSTRACT

This experimental study investigates how behavior changes after receiving punishment. The focus is on how proposers in a power-to-take game adjust their behavior depending on their fairness perceptions, their experienced emotions, and their interaction with responders. We find that fairness plays an important role. Proposers who take what they consider to be an unfair amount feel more shame, particularly if they are punished. This emotional experience induces proposers to lower their claims. We also find that fairness perceptions vary considerably between individuals. Therefore, it is not necessarily the case that proposers who considered themselves fair are being particularly nice to responders.

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1. Introduction

By now, it is a well-documented fact that individuals who participate in economic experiments are willing to spend money in order to punish people who treat them unkindly (Fehr et al., 2002). Moreover, several studies have found emotions to be an important motivating factor behind this type of behavior (e.g., Bosman and van Winden, 2002; Sanfey et al., 2003; Quervain et al., 2004). However, thus far research has concentrated on the motivations and behavior of the individuals who do the punishing. The goal of this paper is to investigate through an experiment how individuals who experience punishment behave and the role of emotions in motivating their actions.

Whereas emotions seem to play an important role in motivating individuals to punish others, it is not clear yet in which way (if at all) emotions affect the decisions of those that may be punished. Social emotions such as shame might be important in these situations. Most individuals feel shame when they are seen violating a social norm. In this experiment, we investigate whether punishment in an economic experiment does indeed trigger shame, how this relates to fairness perceptions, and how it affects an individual's reaction to punishment.

For our study, we use a repeated version of the power-to-take game. In this game, the proposer can make a claim on the resources of a responder. Then, the responder can destroy any part (including nothing and everything) of her own resources. Hence, the power-to-take game approximates social environments characterized by appropriation, such as taxation, common agency or monopolistic selling (Bosman and van Winden, 2002). In the experiment, this game was played for two consecutive periods.

An important part of the experimental design is the measurement of the emotions of proposers after they observe whether responders punish them in the first period by destroying their own income. This allows us to study how the proposers' emotional reaction (in the first period) affects their decision in the second period. We find that emotions play an important role in determining how proposers change their decision from one period to the next. Proposers that experienced

punishment and felt high intensities of shame lowered their claim. Proposers who did not experience punishment and felt high intensities of regret increased their claim. Furthermore, we find that the experience of shame does not simply depend on the size of the proposer's claim but is associated with the proposer's *perception* of what is fair.

Finally, the experimental design also allows us to observe how fairness perceptions vary among the subjects. Current theories that incorporate a notion of fairness typically assume that people know what is fair or unfair (see, Fehr and Schmidt, 2006). Although we find support for the idea that fairness matters, we do not find much support for the presence of a clearly shared fairness norm.

The paper is organized as follows: in Section 2 we review related research; in Section 3 we describe the experimental design; we present the results in Section 4; and conclude in Section 5.

2. Related Research

Our work is related to three different areas of research. First, our work is related to research focusing on proposer behavior in ultimatum games. Second, we contribute to the growing literature on the economic significance of emotions and their role in norm enforcement and compliance. Third, this paper is related to studies concerned with how fairness perceptions affect individual behavior.

Even though there are no studies exploring proposer behavior in the power-to-take game, there is considerable research on proposer behavior in the ultimatum-bargaining game (Güth et al., 1982).¹ Space constraints allow only a quick overview of the main findings (for an extensive summary (see, Camerer 2003). Broadly speaking, proposers seem to be motivated by a combination of “profit-maximizing” and “nonprofit-maximizing” behavior. Profit-maximizing behavior—in the sense of going for the highest offer that will not be rejected—is clearly observed since

¹ The power-to-take game differs in 3 important ways from the well-known ultimatum game. First, in the power-to-take game each participant has an endowment. Second, in this game only the endowment of the responder is at stake. And third, the responder can destroy any amount of her endowment. See also Andreoni et al. (2003) for a similar game.

proposers adjust their offers depending on the likelihood that responders reject them. For example, offers go down in cases where responders are less likely to reject, such as when the total size of the pie is unknown (Camerer and Loewenstein, 1993; Straub and Murnighan, 1995; Rapoport et al., 1996), when there is competition among responders (Fischbacher et al., 2003), or in the extreme case of a dictator game in which responders cannot reject at all (Forsythe et al., 1994). However, the fact that, even in completely anonymous dictator games there are positive offers seems to indicate that there is a degree of nonprofit-maximizing (perhaps fairness-guided) behavior. Further evidence of nonprofit-maximizing behavior is provided by Lin and Sunder (2002) and Brennera and Vriend (2006) who find that, given the responders' reactions, the proposers' offers are higher than the optimal offer.² By analyzing whether emotions play a role in proposer behavior, we can shed light on the relative importance of profit-maximizing and nonprofit-maximizing factors in the decisions of proposers.

There are various papers that explore the potential role of emotions—in particular, the avoidance of guilt and shame—in the observed nonprofit-maximizing behavior of individuals. For instance, feelings of shame are conjectured to explain why proposers in dictator games take more as the level of anonymity increases (see, Hoffman et al., 1996; Dana et al., 2006). Similarly, shame is also attributed to the positive effect of nonmonetary sanctions on norm compliance (e.g., Masclet et al., 2003; Noussair and Tucker, 2005; Xiao and Houser, 2005). With respect to guilt, there is a growing experimental literature testing theoretical models of guilt aversion (Charness and Dufwenberg, 2006). In this case, guilt is modeled as disutility caused when individuals do not fulfill the expectations of others. Experimental evidence in favor of this interpretation of guilt is mixed: Charness and Dufwenberg (2006) and Reuben et al. (2008) find that changes in the expectations of others do produce changes in the amount returned by responders in a trust game, whereas Ellingsen et al. (2007) fail to find an effect. In this paper, we complement

² See also Henrich et al. (2001) for clear evidence of such suboptimal offers in various nonwestern societies.

this literature by actually measuring emotions. This way we can confirm, as conjectured, that the observed behavioral changes are indeed driven by shame and guilt.

There are a small but growing number of studies that measure emotions and relate them to norm-influenced behavior. However, they concentrate on the emotions and behavior of responders. By now, there is strong evidence suggesting that the destruction of income by responders is induced by anger-like emotions (such as anger, irritation, and contempt). For example, Bosman and van Winden (2002) introduced the power-to-take game with the specific purpose of investigating the importance of emotions for reciprocity. Their results show that the destruction of income is related to the intensity of experienced anger-like emotions, which in turn is positively related to the actual take rate and negatively to the expected take rate (see also, Bosman et al., 2005; Reuben and van Winden, 2008). Recently, evidence has been found of a biological substrate for the negative reciprocity exhibited by responders: individuals who punish exhibit heightened arousal levels (Sanfey et al., 2003; Ben-Shakhar et al., 2007). More revealingly, effective punishment has been found to be correlated with neural activity in areas of the brain that are involved in the processing of rewards (e.g., Quervain et al., 2004). With this paper, we take an important next step in this line of research by studying how emotions affect the decisions of proposers. To the best of our knowledge, the only paper that investigates the emotions of proposers is Spitzer et al. (2007). They find that the threat of punishment is correlated with brain activity in areas that are involved in social cognition and interestingly also the insula, which is associated with emotions such as anger and fear. Our focus differs from that of Spitzer et al. (2007) in that we concentrate on the proposers' emotional reaction *after* receiving punishment and how it affects their subsequent behavior.

Finally, this study is related to research on the perception of fairness norms. A few researchers explicitly asked for the fairness perceptions of individuals (e.g., Binmore et al., 1991), but most have not analyzed how fairness perceptions interact with behavior. Pillutla and Murnighan (1996) do measure the fairness perceptions of responders in an ultimatum game and find that perceived unfairness is related to

the rejection of offers. However, more recent research by Reuben and van Winden (2008) indicates that, once the effect of the offered amount and the responder's expected offer are taken into account, the perceived unfairness of an offer has no longer a significant effect on responder behavior. Nonetheless, fairness perceptions might play a significant role when it comes to proposer behavior.

3. The Experiment

We use a repeated version of the power-to-take game. Subjects play the game for two periods. In each period, one subject, the proposer (with endowment E_{prop}), is matched with another subject, the responder (with endowment E_{resp}). The game consists of two stages. In the first stage, the randomly chosen proposer decides on the "take rate" $t \in [0, 1]$, which is the fraction of the responder's endowment after the second stage that is transferred to the proposer. In the second stage, the responder decides to destroy a part $d \in [0, 1]$ of her own endowment E_{resp} . The payoff of the proposer equals her endowment plus the transfer from the responder: $E_{prop} + t(1 - d)E_{resp}$. The responder's payoff equals the part of her endowment that she does not destroy minus the amount transferred to the proposer: $(1 - t)(1 - d)E_{resp}$. In the experiment all endowments were equal ($E_{resp} = E_{prop}$).

In each of the two periods, subjects are randomly assigned to either the proposer's role or the responder's role. Each proposer is randomly paired with a responder using a perfect-stranger matching protocol. Note that this eliminates any incentive to build up a reputation. In addition, this procedure produces a group of subjects that had the same role in both periods and another group that switches roles between periods. Although we are primarily interested in the behavior of subjects who are proposers in both periods, the randomization of roles is done in each period to keep the experimental procedure identical.

During the experiment, we use self-reports to measure the proposers' emotions, expectations, and fairness perceptions. The proposers' emotions towards the responder are measured after the proposer observes the destruction rate. Emotions are measured by providing subjects with a list of fourteen emotions and asking them to report on a 7-point scale with what intensity they experienced each

emotion. The scale ranges from “no intensity at all” (1) to “very intensely” (7). The list includes the following emotions: pride, envy, anger, guilt, joy, shame, irritation, gratitude, surprise, contempt, disappointment, admiration, regret, and sadness. A variety of emotions is used to avoid pushing subjects in a particular direction. Expectations are measured by asking proposers after they choose a take rate, to indicate the most likely value for d .³ We measure the subjects’ fairness perceptions by asking them to indicate the fair amount a proposer should take.⁴ We ask for the “fair take rate” at the end of the experiment in a debriefing questionnaire.

Self-reported measures of emotions are commonly used in social psychology (Robinson and Clore, 2002). Furthermore, in this paper, the use of self reports has an important advantage. Namely, it allows us to study social emotions such as shame, for which a clear physiological reaction pattern has not been identified (Adolphs, 2002).⁵ Since social emotions are essential for the study of norm enforcement, we require a technique that is capable of clearly measuring them. This is not to say that self reports do not have limitations. In particular, one could worry that subjects do not report their true emotions and instead report a different emotional reaction—for example, what they think the experimenter expects. However, we think that in this study, this type of behavior is unlikely to arise as the list of fourteen emotions makes it hard for a subject to identify what the emotions of interest are. Reassuringly, considerable research has demonstrated that self-reported emotional experiences are correlated with various physiological measures like heart rates and facial movements (Bradley and Lang, 2000). For example, self-reported anger has been shown to be correlated with measures of physiological arousal in the power-to-

³ We measure expectations in this way since subjects might have difficulty reporting a probability distribution over the interval $[0, 1]$. The question used was “What percentage do you think B (the responder) is going to choose?”

⁴ The question used was “What would be in your opinion, the *fair* percentage that A (the proposer) should choose in this experiment?”

⁵ The closest neurological correlate for a social emotion is reported by Takahashi et al. (2004), who find a correlation between self-reported guilt and the medial prefrontal cortex and posterior superior temporal sulcus (both brain areas are associated with the theory of mind).

take game (Ben-Shakhar et al., 2007). This evidence lends support to our use of self-reports as a trustworthy measure of emotional intensity.

We now turn to the theoretical predictions of this game. Traditional economic theory, assuming own-payoff maximization, predicts that a proposer will choose to take essentially all of the responder's endowment and that the responder will not destroy. However, previous work has shown that this is not the case. Responders consistently destroy some or all of their endowment when faced with high take rates, and proposers hardly ever choose to take all of the responder's endowment (Bosman and van Winden, 2002). In order to explain behavior in this and similar games, researchers have constructed models that incorporate different kinds of fairness norms (for a review see, Fehr and Schmidt, 2006).⁶ However, it is not the aim of this paper to test the performance of individual models of social preferences. Instead, we wish to investigate more directly what motivates proposers without making a specific assumption on the type of fairness norm that they might be using. This way we hope to improve our knowledge of proposer behavior in order to produce more accurate theoretical models in the future.

3.1 Experimental Procedures

The computerized experiment was run in October 2003 and May 2005 at the CREED laboratory of the University of Amsterdam. In total 208 undergraduate students participated in the experiment. About 35% of the subjects were women. Moreover, 49% were students of economics and the rest were students from other fields such as biology, political science, and law. Subjects received a show-up fee of 2.5 euros, independent of their earnings in the experiment, and 10 euros as endowment in each of the two periods. On average, subjects were paid out 21.25 euros. The whole experiment took one hour.

⁶ Some of these models predict remarkably well the behavior of responders in the power-to-take game. Although, to the best of our knowledge, none of these models simultaneously explains proposer behavior in both the ultimatum and power-to-take game. In particular, if a model is calibrated to explain proposer behavior in the ultimatum game, it predicts that in the power-to-take game proposers take considerably less than they actually do. For a more thorough discussion see Reuben (2006).

After arrival in the lab's reception room, each subject drew a card to be randomly assigned to a seat in the laboratory. Once everyone was seated, the instructions for the experiment were read out loud. Subjects were told that the experiment consisted of two independent parts (each part being one of the two periods of the game). We emphasized the fact that their choices in the first part of the experiment would not affect their earnings in the second part. Furthermore, it was explained that the instructions for each part would be given at the beginning of the respective part. At this point, the power-to-take game was described including a few exercises to confirm their understanding of the game. Subjects were informed whether they were assigned to the role of proposer or responder in the first period of the game by opening an envelope on their desk. Subsequently, they played the first period of the power-to-take game via the computer.⁷ The instructions for the second part consisted of simply informing subjects that they would play the same game once again. We stressed that they would play against a different person and that their role would be randomly determined once again. Thereafter, subjects played the second period of the two-period power-to-take game. The instructions used can be found online in the authors' personal Web pages. The online materials also include the subjects' individual choices and descriptive statistics.

4. Results

In this section, we analyze how proposers adjust their behavior from period one to period two. We first investigate how the responder's behavior affect the proposers' take rate. We then study how the proposers' expectations and emotions in period one, affect their choice in period two. Lastly, we investigate how fairness norms influence the proposers' decision. Unless it is otherwise noted, we refer to the behavior of subjects who are proposers in both periods.

4.1 Proposer behavior

Proposers in this experiment behave similarly to proposers in other power-to-take experiments. The average take rate (over both periods) is 56.4%, and the median

⁷ The experiment was programmed and conducted with the software z-Tree (Fischbacher, 2007).

TABLE 1 – DESCRIPTIVE STATISTICS FOR PROPOSERS

Variable	Proposer in both periods		Proposer only in period 1	Proposer only in period 2
	Period 1	Period 2	Period 1	Period 2
Take Rate	53.8% (22.1)	59.0% (21.4)	59.1% (21.4)	65.0% (18.8)
Destruction Rate	12.0% (28.9)	9.0% (26.2)	11.9% (26.2)	17.8% (35.7)
Expected Destruction Rate	14.0% (25.7)	9.9% (19.7)	15.2% (30.9)	24.6% (32.9)
Frequency of Destruction	21.8%	14.5%	26.5%	24.5%
Fair Take Rate	33.3% (28.2)		43.6% (24.5)	37.0% (22.6)

Note: Means and standard deviations (in parenthesis).

take rate is 60.0%. Table 1 shows additional descriptive statistics as well as the behavior of subjects who switch roles between periods. As in previous studies, we do not find that demographic variables, such as gender or age have an effect on the chosen take rate.

Next, we analyze how proposers adjust their take rate. On average, proposers increased their take rate by 5.16 percentage points. The increase is significant with a Wilcoxon matched-pairs signed-rank test (WSR, $p = 0.001$).⁸ If we look at the individual level, we find that 61.8% of proposers change their take rate from period one to period two (25.5% change it by more than 10 percentage points). Moreover, of those who change their take rate, 20.6% decrease it and the other 79.4% increase it. The proposers' decision to change the take rate is strongly affected by the behavior of the responder in the first period. This leads us to our first result.

⁸ All tests in this paper are two-sided.

RESULT 1: Proposers who face a responder who does not destroy increase their take rates whereas proposers who face a responder who does destroy keep their take rate constant.

Support: The average take rate of proposers who do not experience destruction increases from 50.2% to 57.2%. The change in the take rate is significantly different from zero (WSR test, $p = 0.001$). In contrast, the average take rate of proposers who experience some destruction remains at the same level: it changes from 66.6% to 65.3% (WSR test, $p = 0.622$).

Experiencing no destruction, however, explains only a part of the proposers' decision to change the take rate. Not all proposers who experience zero destruction increase their take rate, only 62.8% do. Similarly, in spite of observing some destruction, one third of proposers go ahead and increase their take rate. The next step in our analysis is to try to explain why, when faced with a similar situation, some proposers decide to change their take rate and some do not. In order to do so, we divide proposers depending on whether or not they experience destruction.

We start by looking at proposers who face in period one a responder who does not destroy. A possible reason why some of these proposers increase their take rates while others do not is that their expected destruction rates are different. It is reasonable to suppose that proposers who expect positive destruction and observe zero destruction are more likely to increase their take rate than proposers who correctly anticipate no destruction. To check whether this is the case, we look at the correlation between the change in the take rate and the proposer's expected destruction rate. The correlation coefficient is positive but it is low and statistically insignificant (Spearman's $\rho = 0.141$, $p = 0.366$).

In order to further investigate why some proposers change their take rate and others do not, we look at their emotional response. Descriptive statistics of the proposers' emotional response are available in Table 2. We find the following result:

TABLE 2 – EMOTIONAL REACTION OF PROPOSERS DEPENDING ON DESTRUCTION

Emotion	Responder did not destroy		Responder destroyed a positive amount	
	Period 1	Period 2	Period 1	Period 2
admiration	3.07 (1.92)	3.36 (2.08)	2.42 (1.44)	1.50 (1.07)
anger	1.09 (0.48)	1.26 (0.74)	3.67 (2.46)	3.25 (1.58)
contempt	1.35 (0.90)	1.36 (0.92)	2.50 (1.73)	2.75 (1.75)
disappointment	1.33 (0.89)	1.32 (0.84)	4.33 (2.10)	4.25 (2.38)
envy	1.23 (0.68)	1.34 (0.92)	3.00 (1.86)	2.00 (1.60)
gratitude	4.67 (1.86)	4.94 (1.69)	2.50 (1.45)	2.38 (1.92)
guilt	2.07 (1.35)	2.45 (1.56)	2.00 (1.35)	1.75 (1.49)
irritation	1.40 (1.28)	1.28 (0.83)	4.17 (1.85)	3.88 (2.03)
joy	5.02 (1.42)	4.96 (1.82)	2.83 (1.70)	3.25 (2.55)
pride	3.91 (1.84)	4.15 (2.13)	2.75 (1.14)	1.50 (1.07)
regret	2.05 (1.36)	2.04 (1.53)	3.25 (1.48)	2.88 (2.17)
sadness	1.19 (0.79)	1.17 (0.56)	2.58 (1.78)	2.00 (1.77)
shame	1.86 (1.30)	2.26 (1.45)	2.42 (1.56)	1.50 (1.41)
surprise	3.00 (1.89)	3.26 (1.7)	4.42 (2.19)	4.25 (2.31)

Note: Mean emotional intensities and standard deviations (in parenthesis).

RESULT 2: Proposers who increase their take rate after experiencing zero destruction are proposers that report high intensities of regret.

Support: A Wilcoxon-Mann-Whitney (WMW) test reveals that, among proposers who experience no destruction, proposers who increase their take rate report higher intensities of regret ($p = 0.033$) than proposers that do not change or decrease their take rate (2.5 vs. 1.5).

Result 2 is quite intuitive. As one would expect, if a proposer reports feeling regret after observing zero destruction, it is because she realizes that she could have chosen a higher take rate. What is more interesting is that feeling regret does not seem to be related to the proposer's expectations. One could think that proposers that report high intensities of regret are proposers that expect responders will destroy and then experience no destruction. However, we find that this is not the case. Proposers who expect some destruction and experience no destruction report an average intensity of regret of 2.3, which is close to the 1.9 average regret reported

by proposers who expect and experience no destruction (the difference is not statically significant, WMW test, $p = 0.377$).⁹

A possible explanation for this result is that some proposers do not want to take more than the amount they are already taking (e.g., due to fairness considerations). Thus, they do not feel regret even though they realize they could have chosen a higher take rate. There is some evidence that supports this view. If we look at the correlation between the intensity of regret and the fair take rate, we find it is positive and (weakly) significant (Spearman's $\rho = 0.265$, $p = 0.087$). This suggests that proposers who feel regret when they learn they could have taken more are those who consider that taking a lot is fair.

Note that the lack of adjustment of some proposers is not due to lack of learning. For example, proposers who keep their take rates constant after observing zero destruction report low intensities of regret, and at the same time, adjust down their expectation of future destruction (from 14.0% to 1.88%, WSR test, $p = 0.026$). This shows that they understand they could have taken more but choose not to do so.

It is possible that instead of capturing an effect of regret, this result could be the consequence of a more general negative mood. To test whether regret is in fact distinct from other emotions, we use principal factor analysis to analyze the proposers' negative emotional response in period 1. The results are presented in Table 3.

We find that three factors do a good job at summarizing the proposers' emotional response. The first factor consists of anger-like emotions (anger, irritation, and contempt) as well as disappointment, sadness, and envy. The second factor clearly represents the social emotions of shame and guilt, and the third factor picks up the effect of regret. For robustness, we also analyzed the emotional response of

⁹ Similarly, the change in the take rate for proposers who expect positive destruction and face zero destruction is not significantly different from the change in the take rate of those who correctly anticipate no destruction (WMW test, $p = 0.390$). This might suggest that expectations do not have a strong impact on the proposer's decision. However, since we do not have information on what proposers expect responders will do at take rates other than the one they choose, it is premature to conclude that expectations do not play a role.

TABLE 3 – FACTORS UNDERLYING THE SUBJECTS NEGATIVE EMOTIONAL RESPONSE

Factor	Proposer in both periods			Proposer only in period 1		
	1 st	2 nd	3 rd	1 st	2 nd	3 rd
Proportion of variance explained	0.46	0.21	0.16	0.50	0.21	0.12
	Factor loadings			Factor loadings		
anger	0.93	-0.02	0.18	0.91	0.07	0.12
disappointment	0.92	0.07	0.27	0.91	-0.03	0.05
envy	0.85	-0.08	0.30	0.83	0.19	0.12
sadness	0.83	0.29	-0.26	0.74	0.27	0.29
irritation	0.77	-0.04	0.29	0.88	-0.02	0.08
contempt	0.58	-0.13	0.59	0.87	0.16	-0.12
regret	0.21	0.19	0.83	0.09	0.27	0.94
shame	0.03	0.92	0.09	-0.01	0.88	0.29
guilt	0.02	0.95	0.01	0.15	0.93	0.11
	KMO test = 0.74			KMO test = 0.83		

Note: Principal factor analysis of the proposers' negative emotional response in period 1. Reported factors are unrotated and account for at least 80% of all variation.

subjects who played as a proposer in period 1 but as responders in period 2. The resulting factors are very similar in both cases, which is reassuring.¹⁰ Moreover, results remain qualitatively similar if we use the second-period data or if we use rotated factors. Given this analysis, we can confirm that regret is indeed the emotion behind Result 2.

We now turn to proposers who face a responder who destroys some or all of her endowment. As in the previous case, it is possible for expectations to explain why some of these proposers change their take rate while others do not. Proposers who experience a higher-than-expected destruction rate could for that reason decrease their take rate more than proposers who experience a lower-than-expected destruction rate. Unfortunately, we cannot test this since none of proposers who experience destruction expect a destruction rate that is higher than the one they

¹⁰ The main difference is the role of contempt: for subjects who are proposers in both periods, contempt is distributed between the first and third factor. In contrast, for subjects who are proposers in period 1 and responders in period 2, contempt is clearly only part of the first factor.

face.¹¹ Again, in order to get additional insights on the proposers' behavior, we analyze their emotional response. We find the following result.

RESULT 3: Proposers who decrease their take rate after experiencing positive destruction are proposers that report high intensities of shame.

Support: A WMW test shows that among proposers who experienced positive destruction, proposers who decrease their take rate report higher intensities of shame ($p = 0.016$) than proposers that do not change or increase their take rate (4.0 vs. 1.6).¹²

Note that the factor analysis reported under the previous result, indicates that the social emotions of shame and guilt capture a distinct emotional reaction, which is independent of other negative emotions. Thus, we can confidently conclude that Result 3 is driven by these social emotions.¹³ This gives us an important insight into what motivates proposers to decrease their take rate.

The emotion of shame is triggered when an individual violates a social norm, even in anonymous settings such as in this experiment (see, Tangney et al., 1996). If destruction by responders makes proposers feel bad by triggering shame, one would expect proposers to lower their take rates in order to feel better. Naturally, this opens up the question: why do some proposers feel shame while others do not? We know from previous research that the experience of shame is highly influenced by the perceived disapproval of others (Tangney and Dearing, 2002). This ought to be reflected in the proposers' belief of what is the appropriate or fair amount to take. We explore the effect of fairness perceptions in the following paragraphs.

¹¹ If we look at the correlation coefficient between the change in the take rate and the difference between the experienced and expected destruction rate we find it is low and far from statistical significance (Spearman's $\rho = -0.146$, $p = 0.650$).

¹² Similarly, a Kruskal-Wallis test gives a (weakly) significant result if we test for equal intensity of shame between proposers who decrease, increase or do not change their take rate ($p = 0.057$).

¹³ Although shame and guilt are clearly related emotions, in this paper, we concentrate on shame. Guilt shows a very similar pattern. Albeit, in this paper we find that the link between guilt and behavior is somewhat weaker. In subsequent work, Hopfensitz and Reuben (2008) do find that guilt is related to the behavior of norm violators.

4.2 Fairness norms

A casual look at the data reveals that shame is not triggered by high take rates. The correlation between the take rate and the intensity of shame is close to zero (Spearman's $\rho = 0.048$, $p = 0.729$). Thus, if shame is indeed triggered by deviations from a fairness norm, it appears that not all proposers consider it a norm violation to choose a high take rate. On closer inspection, this seems to be the case. Once we take into account the proposers perceived fair take rate t^f , we get a clear result.

RESULT 4: Proposers who chose take rates that they consider unfair experience higher intensities of shame.

Support: If we divide the proposers into those who choose a take rate that they consider unfair ($t > t^f$) and those who choose a take rate that they consider (more than) fair ($t \leq t^f$), we find that in both periods, proposers who choose an unfair take rate report higher intensities of shame than proposers who choose a fair take rate (WMW tests, $p < 0.018$). Furthermore, this result does not depend on the destruction rate. If we divide proposers depending on whether they face positive destruction or not, in both groups we find higher intensities of shame among those who choose an unfair take rate (WMW tests, $p = 0.008$ for proposers who face positive destruction and $p = 0.064$ for those who do not).

In summary, as is illustrated in Figure 1, we have a group of proposers who believe they made a fair choice and therefore feel low intensities of shame (even after facing destruction), and another group of proposers who acknowledge they made an unfair choice and hence feel high intensities of shame. Interestingly, we also find that the act of destruction has an effect on shame. Namely, among proposers who choose an unfair take rate, those who experience positive destruction report higher intensities of shame (WMW test $p = 0.033$). This is consistent with destruction also serving as a message conveying responder's displeasure. Results 3 and 4 can be summarized in the following corollary.

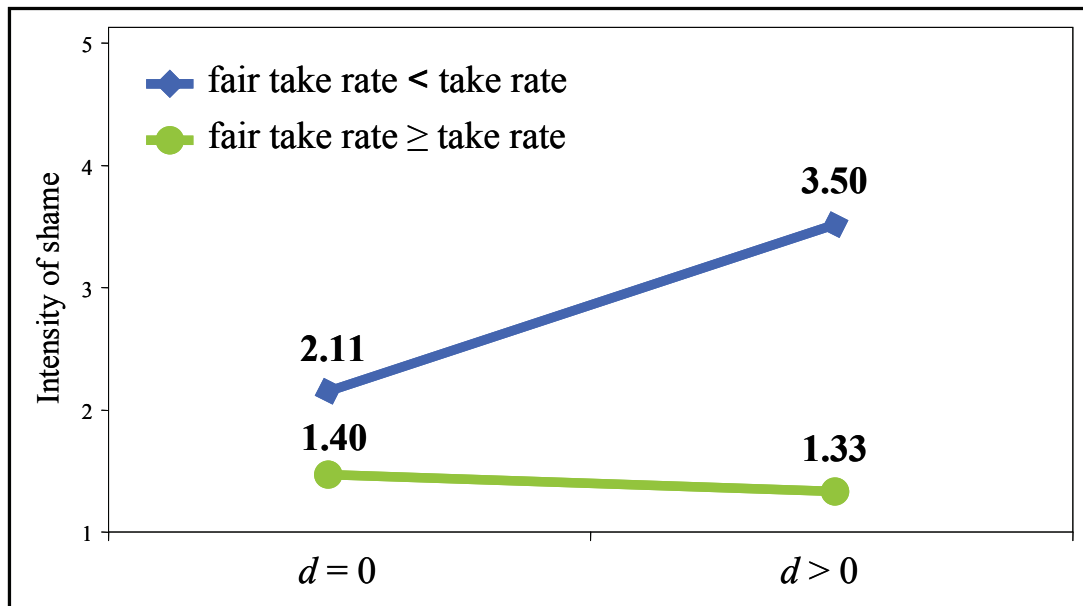


FIGURE 1 – PROPOSERS INTENSITY OF SHAME DEPENDING ON DESTRUCTION IN PERIOD 1

COROLLARY: Fairness perceptions, by triggering feelings of shame, have an impact on proposer behavior.

Note that the influence of shame is likely to be bigger than the one we observe. After all, proposers who correctly anticipate experiencing high intensities of shame will avoid feeling it by taking less than their fair take rate. Thus, in addition to the observed ex-post adjustment in take rates, shame can also have an effect by deterring the choice of high take rates already in the first period. In other words, proposers who choose an unfair take rate must feel only moderate amounts of shame as they are willing to tradeoff the disutility of shame with a higher expected monetary payoff. It is only these moderate levels of shame that we observe. We further discuss this role of shame in the conclusions.

Although we find a link between fairness perceptions and behavior, we also find that what is regarded as fair varies considerably. This is stated as our next result.

RESULT 5: Even among proposers, there is little agreement on what the fair take rate is.

Support: This is clearly seen in Figure 2. Roughly one third of proposers think taking zero is fair, another third thinks taking 50% is fair, and the rest is more or less

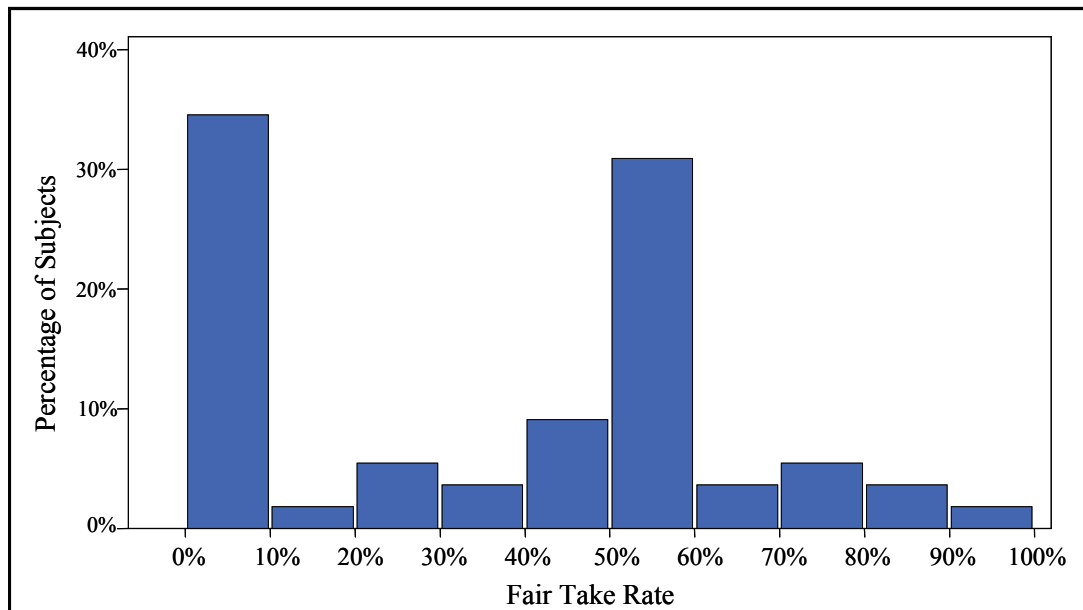


FIGURE 2 – HISTOGRAM OF FAIR TAKE RATES OF PROPOSERS

evenly distributed among the remaining take rates. Note that, this result is not limited to proposers. We find a very similar distribution of fair take rates for subjects playing twice as a responder.

Interestingly, we do not find a self-serving bias: subjects who are proposers twice do not choose significantly higher fair take rates than subjects who are responders twice (on average 33.3% vs. 29.5%; WMW test, $p = 0.593$).¹⁴ We know from the literature on self-serving biases that individuals evaluate fairness differently depending on their position in the game (Schmitt, 2004). This result indicates that even in the same position there can be considerable variation in fairness perceptions.

Interestingly, it is not necessarily true that proposers who act fairly (in their opinion) are being considerably nicer to others. The main difference between proposers who choose a take rate they think is fair and proposers who choose a take rate they think is unfair, is their fairness perception and not their chosen take rate.

¹⁴ We do find a difference between subjects who do not switch roles and subjects who do. Those who switch roles report significantly higher fair take rates (40.3% vs. 31.4%, WMW test, $p = 0.004$). Perhaps, experiencing both roles makes more salient the fact that there is mobility between positions. This may induce a belief that everyone will be in an advantageous position at some point, and hence consider it acceptable for people to take advantage of those occasions.

For example, in the first period, proposers who think they are unfair choose a take rate that is 6.6 percentage points higher than proposers who think they are fair, but at the same time, they report a fair take rate that is 33.29 percentage points lower than proposers who thought they are fair.

5. Conclusions

In this paper we investigate how proposers in the power-to-take game adjust their behavior depending on their interaction with responders, their fairness perceptions, and experienced emotions. Our main results can be summarized by the following statements:

- The emotional experience of proposers helps explain their reaction to receiving punishment or not. Proposers who feel regret when not punished tend to increase their take rates, and proposers who feel shame when punished tend to decrease them.
- Fairness considerations appear to play an important role by influencing the emotional reaction of proposers. If not punished, fair-minded proposers tend to feel less regret. If punished, proposers who consider their take rate unfair feel more shame.
- The perceived fairness norm varies considerably between individuals.

Our results show that the emotion of shame plays a significant role in the proposers' decision-making process. Of particular importance is the observation that if responders destroy, they provoke higher intensities of shame among some proposers. This implies that destruction not only reduces the proposers' income but it also makes them feel bad. In other words, shame makes punishment of norm violators cheaper. This highlights the importance for responders to signal their displeasure as the mere existence of a fairness norm might not be enough to restrain the proposers' behavior.

The fact that some proposers do not adjust their behavior after being punished combined with the finding that these proposers consider their take rate to be fair and do not feel high intensities of shame highlights the importance of punishment to be legitimate for it to be effective. This observation helps explain why

punishment or the threat of punishment promotes cooperation in certain situations whereas in others it does not (see e.g., Houser et al., 2008; Reuben and Riedl, 2008). In other words, punishment on its own is not enough to promote prosocial behavior. There must also be an understanding of what is fair and what is unfair.

Given the reported importance of fairness norms, it is interesting that fairness perceptions vary substantially among proposers. Considering that what is and what is not fair can be hard even for philosophers to define, it is unsurprising that not all proposers agree on what is fair in the power-to-take game. The difficulty of defining fairness means that, even if proposers want to be fair, they first have to figure out what fairness means in a specific context. This opens the door to “moral learning”. That is, individuals adjusting their belief of what is fair as they gain experience in a given situation. As a consequence, what turns out to be fair in the long run could vary considerably depending on the experiences of those involved in the learning process. Whether this kind of learning occurs is an interesting question for future research.

The results of this paper are encouraging for the modeling of emotions in economics. The fact that experiencing shame affects the proposers’ subsequent behavior is consistent with models that incorporate social emotions. Knowing that the specific emotion of shame plays a role in this type of setting can inform us on how to best use tools such as psychological game theory (Geanakoplos et al., 1989) to model norm-influenced behavior.¹⁵ For example, research on emotions tells us that people feel more shame in situations in which others can clearly observe their actions and show disapproval (Tangney and Dearing, 2002). This would be consistent with proposers asking more in ultimatum games in which the amount to be divided is unknown. If uncertainty over the size of the pie prevents responders from clearly judging the actions of proposers, proposers might feel less shameful when making a low offer. It would also be consistent with a lower proportion of proposers choosing the equal split in the dictator as opposed to the ultimatum

¹⁵ There are already a few attempts of formally modeling specific social emotions. These include Bowles and Gintis (2005), Charness and Dufwenberg (2006), and Miettinen (2006).

game.¹⁶ Since, in dictator games responders cannot signal their displeasure, proposers are less exposed to feel high intensities of shame.

As mentioned in the previous section, shame can have additional effects on behavior if people anticipate their own emotional response and act in order to avoid feeling shame. In this experiment, we cannot test whether this is true. However, recent work by Lazear et al. (2006) provides support to this idea.¹⁷ If proposers make positive offers in dictator games for the sole reason of avoiding feelings of shame then, if given a choice, they would like to avoid being in the dictator game in the first place. Lazear et al. (2006) study precisely this situation and find that proposers who give the most when forced to play a dictator game are also the most willing to avoid playing. This is exactly what a model that incorporates individuals who anticipate feelings of shame would predict.

Another implication of this paper is that the motivation of proposers is actually quite different than that of responders. Whereas proposers seem to be influenced by fairness norms which trigger emotions such as regret and shame, responders are affected more by their expectations and emotions such as anger and irritation (van Winden, 2001). This suggests that although taking a small amount and punishing those who take large amounts are both deviations from standard predictions, they are the result of two very different decision-making processes.¹⁸ In fact, in the experiment we find no relationship between the two. If we look at subjects who switched roles, subjects who destroy in the first period do not choose lower take rates in the second period (WMW test, $p = 0.745$). Similarly, subjects who

¹⁶ The lower frequency of equal splits in dictator games compared to ultimatum games cannot be explained by most models of social preferences. Given the observed rejection behavior of responders in ultimatum games, monetary gains are maximized by offers that are lower than the equal split. Therefore, proposers who choose the equal split must do so for reasons other than the potential monetary loss due to rejection. Hence, removing the possibility of rejection, as in dictator games, should not affect the choice of these proposers.

¹⁷ See also Dana et al. (2006).

¹⁸ In this context, see Loewenstein et al. (1989) for a discussion on the qualitative difference between the reactions of individuals depending on whether they have a positive or negative relationship with others.

choose above-average take rates the first period do not destroy less in the second period (WMW test, $p = 0.758$). In other words, individuals that are willing to punish others for treating them badly are not necessarily willing to treat others nicely. More generally, these findings suggest that proposer and responder behavior should be modeled separately.

Finally, we wish to emphasize that measuring the emotional reaction of subjects can help us understand what is motivating them to make certain decisions. In this case, we identify shame as an important motivation for proposers to lower their take rates. We do not argue that it is always necessary to know the precise emotional and cognitive processes by which subjects arrive at a decision. However, whenever we have a situation in which theory does not provide us with good predictions, a better understanding of the motivations of individuals can give us insights to improve our models.

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