The Behavioral Impact of Emotions in a Power to Take Game: An Experimental Study

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Abstract

The power to take game is a simple two player game where players are randomly divided into pairs consisting of a take authority and responder. Both players in each pair have earned an *own* income in an individual real effort decision-making experiment preceding the take game. The game consists of two stages. In the first stage, the take authority decides how much income will be transferred from the responder to the take authority after the second stage (the so-called take rate). In the second stage, the responder can punish the take authority by destroying own income. The transfer from the responder to the take authority will be based on the income of the responder that is left *after* the second stage. In this experimental study, we are primarily interested in how emotions influence responder behavior. Our findings are the following. (1) A higher take rate significantly increases the intensity of irritation, contempt, and envy, and significantly decreases the intensity of joy and happiness. Since negative emotions are experienced as painful, there is direct hedonic impact. (2) Irritation and contempt drive punishment behavior. (3) There are discontinuous "jumps" in the behavior of responders. They either choose no punishment (destroy nothing) or the highest level of punishment (destroy everything). (4) Expectations have a significant effect on the probability of punishment but not on the intensity of experienced emotion. We explain this last result in terms of norm-related regulation of emotions.

1. Introduction

Many people would agree that emotions play a very important role in the decisions they make. Extensive research by psychologists over the last two decades has provided a lot of supportive evidence. It appears that emotions play a significant role in matters like attention, learning, and memory (Izard et al., 1984). Recent neuroscientific research even suggests that emotions are essential for rational decision making (Damasio, 1994; Picard, 1997). If emotions play such an important role in psychological processes, they are also likely to be relevant for understanding economic decision making. Frank (1988) argues that emotions are relevant for economics because they can help us solve important commitment problems. He shows, for example, that players endowed with the emotion guilt can sustain the cooperative outcome of a prisoner's dilemma game.[1] Other recent economic studies focus on the effects of emotions on preferences (Hirshleifer, 1987; Loewenstein, 1996) or on the implications for rationality (Elster, 1996, 1998). However, as yet little work has been done to integrate emotion theory in economic research. Elster (1998) addresses this neglect and hypothesizes that it may have to do with the different explananda of psychology and economics: "Whereas economists mainly try to explain behavior, emotion theorists try to explain emotions. By and large, psychological studies of the emotions have not focused on how emotions generate behavior (p. 47)".

The object of this study is to investigate how emotions generate behavior in a laboratory experiment. As our vehicle of research we use a simple "power to take" game. In this two-player game one subject can be considered as the "take authority" and the other subject as the "responder". Before the game is played and the subjects receive instructions about it, both subjects have to earn their *own* income by doing an individual real effort task on the computer. The effort task is set up such that the subjects will end up with the same income. The game consists of two stages. In the first stage, the randomly chosen take authority decides what percentage of the income of the responder is to be transferred to the take authority after the second stage. In the second stage, the only action that the responder can take is to destroy own income. The transfer from the responder to the take authority is based on the income of the responder that is left *after* the second stage. Note that in this game the responder can only destroy his or her own income and not the income of the take authority.

In this study we are primarily interested in how emotions influence responder behavior. Emotion theory and self-reports will be used as instruments. We believe that our design provides an interesting environment to study how emotions generate economic behavior. First, to study a complex issue like emotions, a simple experimental game is helpful as a starting point. The power to take game is very straightforward. For example, if the responder feels that the take authority is unfair, then (s)he can punish by destroying income. Punishment, however, is costly for the responder. An interesting feature of

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[1] Frank (1988) assumes that people give signals about their emotional commitments or dispositions (for example, via facial expression or the pitch of the voice) that are difficult to simulate. In his prisoner's dilemma model these signals are

this game is that punishment is a continuous variable, since the responder can destroy any part of his or her own income. In this way it is possible to learn more about how subjects trade off emotional satisfaction of punishment against monetary gain.[2] Second, subjects have to work for their income in our experiment.[3] In most experimental studies endowments are simply given to subjects, like manna from heaven. If it takes effort to get an endowment, subjects are likely to take the game where this endowment is at stake more seriously.

Moreover, the power to take game is of economic interest in itself. The game models in a simple, abstract, but fundamental way situations where one agent can (potentially) appropriate part of the endowment (effort) of another agent. A first example that comes to mind concerns taxation. In fact, the game can be seen as an elementary version of the tax model of Aumann & Kurz (1977) (see also Gardner, 1981; Peck, 1986). The take authority can be regarded as a majority coalition (government) that by means of taxation can appropriate a part of the endowment of the minority (the responders). The minority can retaliate by destroying part of the endowment. In case the endowment stands for the returns on the supply of a production factor, "destruction of the endowment" could stand for a diminished supply of the factor. This would imply a new source of efficiency cost of taxation. Another situation resembling the power to take game is monopolistic pricing. In case of a monopoly, the monopolist first decides on how much to take from the surplus by setting the price. Subsequently, the buyer decides how much to buy, given the price chosen by the monopolist. If the buyer feels that the price is outrageous, an emotional response may induce the buyer to punish the monopolist by buying less than the rational "text book" buyer would do. A third important situation that we would like to mention concerns principal-agent relationships. The principal can be seen as the take authority who decides on the incentive scheme for the agent. The agent takes notice of the scheme and subsequently decides on his or her effort level. The agent may feel emotionally urged to punish the principal by choosing a low effort level, which is costly for the agent because it conflicts with the material incentives provided by the principal. These examples show that the power to take game is not only interesting to study from an emotional theoretic but also economic point of view.

Although a thorough analysis of the way economic behavior is influenced by emotions is lacking, there are a few experimental studies referring to emotions that should be mentioned. In these studies attention is mainly focused on the role of information and intentions in bargaining games.

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somewhat perturbed and players only know the probability of cooperation by another player.

[2] The frequently studied ultimatum game, where emotions are likely to play a role as well, is less suited for this purpose. In this game punishment is a discrete choice since the responder can either reject (punish the proposer) or accept the ultimatum.

[3] This approach, where subjects earn money in a real effort task, is not entirely new. Van Dijk, Sonnemans & Van Winden (1998) experimentally study how different payment schemes affect real effort in a similar task as used in this paper. In an experimental study of distributive preferences by Rutström & Williams (1997), subjects earn their endowments by solving a computerised version of the Tower of Hanoi problem. Burrows & Loomes (1994) compare bargaining behavior in a treatment where unequal endowments are the result of effort in the so-called Hash game with a treatment where unequal endowments are determined by chance.

Pillutla & Murnighan (1996), for example, manipulate information about the cake size and outside option in an ultimatum game, and find that responders reject more when offerers know the value of the outside option. Their explanation is that intentional low offers lead to wounded pride, feelings of anger, and, ultimately, spiteful behavior. Related to this study is Blount (1995) who manipulates intentionality in an ultimatum game by letting a third neutral party make the offer or by using a computer that determines the offer randomly. This study shows that intentional low offers lead to more rejections than randomly determined low offers. Finally, we mention an interesting video experiment by Hennig-Schmidt (1997), showing that emotions play a crucial role in breaking up group bargaining.

The organization of the paper is as follows. In section 2 we go into some important aspects of emotions, derive our hypotheses for the power to take game, and explain how we measure emotions. The experimental design is presented in section 3, while the experimental results are given in section 4. This is followed by a discussion in section 5. Section 6 concludes.

2. Emotion theory, hypotheses, and measurement

In this section we start with a brief discussion of the psychological literature on emotions. By now this literature is quite substantial and a number of general theories have emerged (Frijda, 1986; Lazarus, 1991; Ortony, Clore & Collins, 1988). In the discussion that follows we will highlight some important features of emotions on which there seem to be consensus in the literature. Next, we will derive some hypotheses regarding the behavior and experienced emotions of the responder, based on this psychological literature. Finally, we end this section with a discussion of our measurement procedures.

Emotions are linked to the interests or concerns of an individual. They arise when things happen that are relevant for one's concerns. To find out whether an event is relevant for one's concerns, it is necessary to evaluate the event. This evaluation implies that at least some cognition or information processing precedes an emotion. Instincts, like hunger or thirst, can be distinguished from emotions because they typically do not require cognitions. A distinction can be made between positive and negative emotions. If interests are promoted, positive emotions result. If interest are damaged, negative emotions arise. Positive emotions, like joy or relief, are experienced as pleasurable whereas negative emotions, such as anger or sadness, are experienced as painful. Emotions thus have a direct hedonic impact (cf Loewenstein, 1996). An important feature of emotions is that they are "cognitively impenetrable": one cannot choose to have or not have emotions, given certain stimuli or events that are relevant for one's concerns (Frijda, p.468).

Emotion theorists neither agree upon how many emotions there are nor upon how they should be defined. There are currently two approaches in defining emotions. One approach tries to explain emotions in terms of cognitive antecedents, which are the events that cause emotions (Ortony, Clore, &

Collins, 1988). Sadness, for example, arises when one is displeased about an undesirable event. If an undesirable event can be attributed to another person and this person can be blamed, then anger results. If an undesirable event has not yet taken place but possibly takes place in the future, then fear is the resulting emotion. The other approach defines emotions in terms of action tendencies, which is the urge to execute a particular action. (Frijda, 1986; Lazarus, 1991). Action tendencies may result in action--for example fleeing, approaching, or attacking--but need not always do so. According to Frijda the most important feature of action tendencies, and thus emotions, is control precedence. "Action tendencies have the character of urges or impulses" and "… clamor for attention and for execution. (…) Evidently, then, action tendencies are programs that have a place of precedence in the control of action and of information processing". People under the influence of emotions do not always carry out an action tendency, they are somehow able to handle or regulate their emotions. The reason is that action tendencies often interfere with other important goals. Regulation implies a re-evaluation where the possible consequences of carrying out an action tendency are taken into account. If, however, the intensity of the emotion is very strong it may surpass what Frijda calls "regulation thresholds" or "points of no return".

The intensity of an emotion depends on a number of factors. First, the importance of the emotion eliciting event with regard to one's concerns. Loosing a job that one likes causes more emotion than loosing one's wallet. Second, the extent to which the emotion eliciting event is real. Imagining winning a large prize in a lottery may cause some emotion, but certainly not as much when one has actually won the prize. Third, the level of physiological arousal of the autonomic nervous system prior to the emotion. More arousal, such as increased heart rate or tenseness of the muscles, leads to a higher intensity of emotions. Fourth, unexpectedness. Loosing a loved one unexpectedly causes more intense emotions than when it has been foreseen for some period of time. In this study we focus primarily on the first intensity variable (importance of the emotion eliciting event) because this variable will be affected by the decisions subjects make, as will be clarified below.

We can now summarize the emotion process in the following scheme, depicted in figure 1. The process starts with an event having consequences for one's interests. If interests are promoted, positive emotions arise. If interests are damaged, negative emotions arise. Second, emotions or action tendencies can influence behavior because they have control precedence. Regulation, however, implies a trade off between the satisfaction of carrying out an action tendency and other interests. In our experiment we hope to learn more about the way this trade off is made.
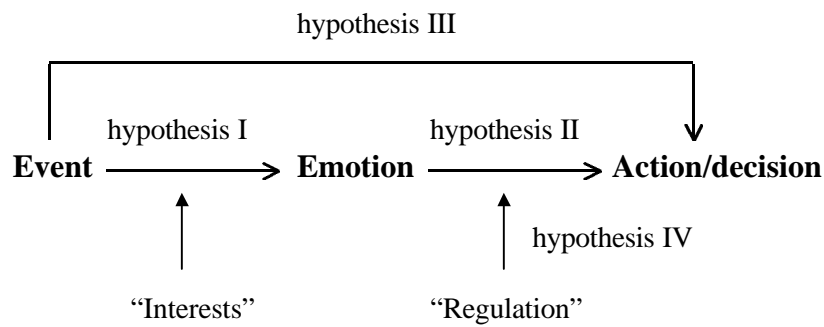
Figure 1: emotion process

We believe that our experiment provides a good environment to study the influence of (negative) emotions on economic behavior. To study such a complex issue as emotions, a simple experimental game is helpful. Our take game is very straightforward. An important concern for subjects who play this game is money. We know from previous experiments that people participate in economic experiments because they want to earn money. Before subjects play the take game, they both have earned an own income. In the take game, the monetary interests of the responder can never be promoted. In the best case the take rate is zero and the responder can keep his or her income. In all other cases the take rate is higher than zero and the responder will loose money. Thus, particularly negative emotions can be expected to arise if the responder is confronted with a positive take rate. Positive emotions, if present at all, will vanish or become less intense if the take rate is higher than zero. However, an additionally important concern for responders may be fairness norms.[4] A natural focal point in the take game would seem to be a take rate of zero percent. Since both players have earned the same income in the effort task preceding the game, a take rate of zero percent implies that both players are equally well off in terms of monetary earnings after the experiment. Norm violation typically generates anger type emotions (Frijda, p. 311).

In principle, several types of negative emotions can arise in this experimental game, such as sadness (responder sees the transfer as an irreversible loss), anger/irritation (responder blames the take authority), contempt (responder has low esteem of the take authority), or envy/jealousy (responder wants to be in the position of the take authority). Unfortunately, there is no consensus among emotion theorists how to differentiate between negative emotions. Theorists disagree about the precise eliciting conditions for emotions that they see as distinct ones. This makes it difficult to predict which distinct negative emotions will be most prominent in our experiment. The experiment will be used to provide more insight into this matter.

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[4] According to Frijda (p. 311) social norms can be seen as interests or concerns of the individual who adheres to these norms.

The most important variable for the intensity of emotions is the extent to which an event affects one's interest. In the take game, a higher take rate means more damage to the interests of the responder. We therefore predict that the higher the take rate, the more intense negative emotions, and the less intense positive emotions, will be experienced.

Hypothesis I: The intensity of negative (positive) emotions experienced by the responder will be positively (negatively) related to the take rate.

The next hypothesis concerns the relation between emotion and behavior. If the interests of the responder are damaged, then the take authority can be held responsible for this. Consequently, the responder may be inclined to punish the take authority by destroying income. In this case the take base will become smaller and the transfer to the take authority will be smaller as well. We therefore predict that the more intense a responder experiences negative emotions, the higher the probability that he or she will destroy income.

Hypothesis II: The probability of destroying income is positively related to the intensity of experienced negative emotions.

The next hypothesis is a corollary of hypotheses I and II. If a higher take rate leads to more intense negative emotions and if more intense negative emotions make a responder more likely to destroy income, then a higher take rate should increase the probability that a responder will destroy income.

Hypothesis III: The probability of destroying income is positively related to the take rate

Our next hypothesis concerns the amount of punishment by a responder. Recall that punishment is costly for the responder, which interferes with the goal of earning money in the experiment. Consequently, one may view the decision of the responder as the outcome of two competing motivations: a `desire' for punishment and a `desire' for money. Now, two mechanisms of decision making are possible. First (M1), the decision of the responder may be a compromise between these two competing motivations. In this case, the result would be an intermediate level of punishment.[5] Second (M2), the decision of the responder may be dictated by the strongest motivation. In that event, there is either no punishment (desire for money dictates) or full punishment (desire for punishment dictates).

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[5] In economic terms, this compromise entails an outcome where the marginal rate of substitution between punishment and income (or other consumption) equals the price ratio. Note that the price ratio depends on the take rate. If, for example, the take rate is 50 %, then taking a dollar away from the take authority will cost the responder exactly one dollar in which case the price ratio is equal to one.

Using a metaphor, one may view the decision making of the responder as the outcome of an election with two competing parties. One party is in favor of punishment whereas the other favors income. Behavior of the responder can be seen as the policy resulting after the election. Mechanism (M1) would then resemble a representative election system and mechanism (M2) a plurality system. Emotion theory seems to support M2 rather than M1 (Frijda[6]; Tesser & Achee, 1994). Our experimental design renders the possibility to discriminate between these two mechanisms of decision making.

Hypothesis IV(a): If a responder destroys income, then it will be a part (between 0 and 100%) of his or her income.

Hypothesis IV(b): If a responder destroys income, then it will be everything (100%).

In addition to these hypotheses, we will investigate whether responders' expectations of the take rate play a role. Expectations were assessed directly after the take game. In principle, there are two ways how expectations could play a role in the emotion process. First, expectations may influence the intensity of experienced emotion as the result of an "unexpectedness" effect. Unexpected positive events cause higher intensity of positive emotions, while unexpected negative events cause higher intensity of negative emotions. Second, expectations may play a role in the regulation phase where the consequences of carrying out an action tendency are appraised. Regulation can suppress as well as amplify emotional urges.[7] Social norms are considered to play a very important role in the regulation phase. Expectations based on social norms may therefore affect decision making in this phase of the emotion process. From the psychological literature on emotions, however, we can not derive a clear prediction of how expectations will affect behavior in our experiment.[8] The investigation of expectations should therefore be seen as an additional, more exploratory, part of this experimental study. In section 5 we will come back to this issue. Obviously, the way we assessed expectations (that is, ex post) has some potential problems. For example, responders who were too optimistic may find it hard to admit that they were wrong and may be inclined to present themselves as realistic (i.e. reporting expectations consistent with reality). We will address this point in the next section when we discuss the experimental results.

We now briefly discuss how we measured emotions. To assess the emotions responders experienced when they learned about the decision of the take authority, we gave them a list of eleven emotion names and ask them to report the intensity of each emotion on a 7-point scale, ranging from "no

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[6] Personal communication.
[7] Frijda, p. 401; Lazarus, p. 114.
[8] For example, Ortony et al. (1988, p.64) make a distinction between unexpectedness and likelihood. Likelihood refers to anticipated events and is forward looking. Unexpectedness is assessed after an event, and is backward looking. Likelihood only influences what Ortony et al call "prospect-based" emotions, such as fear and relief. Unexpectedness, on the other hand, influences the intensity of *all* emotions. Other theorists (e.g. Frijda, 1986) do not make this distinction between

emotion at all" to "high intensity of the emotion". The list included the following emotions: Irritation, anger, contempt, envy, jealousy, sadness, joy, happiness, shame, fear, and surprise. Note that the list is quite extensive and not only includes the emotions that we predicted to be relevant in our setting. Both positive and negative emotions are included in the list, in order to avoid that subjects are `pushed' in a particular direction. Furthermore, note that some emotion words refer to a similar type of underlying emotion (joy-happiness, anger-irritation, envy-jealousy). In our natural language there are often several words for a particular type of emotion. Irritation, annoyance, fury, and outrage, for example, all refer to the same type of underlying emotion, namely anger. Although the underlying emotion is the same, different emotion names have different connotations. Fury and outrage, for example, typically refer to very intense feelings of anger whereas annoyance and irritation are commonly associated with less intense feelings of this emotion. Finally, note that the list included surprise which, according to some theorists, is not an emotion but a pre-emotion (Lazarus, 1991, p. 54). It arises when something unexpected happens and prepares the person to evaluate what is going on. Different emotions, positive or negative, can now follow depending on how the person appraises the unexpected event.

Although assessing emotions with the help of self-reports may seem problematic to some economists, emotion theorists think it is a valuable method of measurement. According to Ortony, Clore, and Collins (1988, p. 9), for example, "There is as yet no known objective measure that can conclusively establish that a person is experiencing some particular emotion, just as there is no known way of establishing that a person is experiencing some particular colour. In practice, however, this does not normally constitute a problem because we are willing to treat people's reports of their emotions as valid. Because emotions are subjective experiences, like the sensation of colour or pain, people have direct access to them, so that if a person is experiencing fear, for example, that person cannot be mistaken about the fact that he or she is experiencing fear".

3. Experimental design

In total 78 subjects, almost all undergraduate students from the University of Amsterdam, participated in the experiment. About half of the subjects (55%) were students of economics. The other half were students from various fields such as chemistry, mathematics, law, planning, and psychology. About 40% of the subjects had participated in an economic experiment, different from this one, before. We framed the take game as neutral as possible, avoiding any suggestive terms like take authority (a translation of the instructions is provided in the appendix). Subjects received a show-up fee of 15 guilders (approximately $ 7.5), independent of their earnings in the experiment. On average, subjects received 28.50 guilders in total. The whole experiment took about one hour and 45 minutes.

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unexpectedness and likelihood and suggest that likelihood can influence the intensity of a variety of emotions.

Before subjects played the one-shot take game, they first had to participate in an individual two-variable optimization task on the computer for 30 minutes.[9] This task consists of 10 periods, where in each period subjects have to search for a maximum value. This maximum, which varies over the periods, can be imagined as the top of a mountain. The payoff for a period is related to the position on the mountain at the end of the period, with a maximum of 1 guilder and 50 cent. The task was set up such that most subjects were able to find the maximum value within the time limit of three minutes. A pilot experiment suggested that subjects indeed perceive this task as a form of work.[10]

After subjects had completed the computer task, they were randomly divided into two groups. One group was referred to as participants A (the take authorities) and the other as participants B (the responders). Then the instructions for the take game were read, followed by two individual exercises on the computer to check subjects' understanding of the procedures. After these exercises, random pairs of a responder and take authority were formed by letting take authorities draw a coded envelope from a box. The envelope contained a form on which the earnings of a responder from the real effort task were stated. The take authorities then had to fill in a take rate as well as their own earnings, and put the form back in the envelope again. Subsequently, the envelopes were brought to the matched responders who filled in the part of their earnings to be destroyed. The envelopes containing the forms were then returned to the take authorities for their information. Then, we asked subjects to fill out a questionnaire with questions concerning expectations, motivations, and emotions. When subjects completed the questionnaires, the envelopes were again collected and brought to the cashier, who paid out the subjects in private.

Finally, it is noted that the experimenters were not able to see what decisions subjects made in the take game and how much they earned. Subjects were privately paid outside the laboratory by the cashier who was not present during the experiment. We have chosen for this double blind procedure in order to minimize any possible distortions of subject behavior due to experimenter observation.[11]

4.Results

Before testing our hypotheses, we start with some general results. Concerning the amount responders and take authorities earned in the real effort task that preceded the take game, it turns out that most of the time paired subjects had exactly the same earnings at the start of the take game, and in any case the

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[9] See Van Dijk, Sonnemans, & Van Winden (1998).

[10] Subjects indicated that they experienced the task as rather neutral, in the sense that it was neither very exciting nor very boring, neither very difficult nor very easy, and neither very pleasant nor very unpleasant.

[11] In our take game, for example, subjects may be concerned about being judged as greedy or vengeful by the experimenter. Bolton & Zwick (1995) tested whether a double blind procedure affects behavior in an ultimatum game and concluded that "the small distortion of subject behavior that may be attributed to experimenter observation is not decisive in the sense that the basic character of the data is unchanged when the distortion is filtered out" (p. 113-14). On the other hand, Hoffman et al (1994) found that in a dictator game double blindness does matter, leading to more greedy behavior of the dictator.

take authorities had at least as much money as the responders.[12] Next, table 1 shows the behavior of the take authorities and responders. As can be observed from this table, take authorities chose considerable take rates. The mean take rate is 58.5, the median 66.7, and the mode 70.0. Furthermore, it appears that eight (21%) of the 39 responders destroyed some or all of their earnings. Six of them destroyed everything, one destroyed 99%, and only one destroyed 30%.

Table 1: Result of the take game

Take rates	Observations		Responders who destroyed income	
%	number	%	number	%
0-9	3	8	0	0
10-19	0	0	0	0
20-29	1	3	0	0
30-39	4	10	0	0
40-49	1	3	0	0
50-59	4	10	0	0
60-69	7	18	0	0
70-79	13	33	4	50
80-89	3	8	2	25
90-100	3	8	2	25
Total	39	100	8	100

Finally, the results of the emotion self-reports of the responders are presented in table 2. As noted before, each responder was asked to report the intensity of experienced emotion when he or she learned about the decision of the take authority. The data show that responders who destroyed their income as well as those who destroyed nothing experienced a variety of emotions. Especially, negative emotions, such as irritation, contempt, anger, and envy obtain a relatively high score. In addition, it is noted that anger is strongly positively correlated to irritation, with a correlation coefficient of 0.71 ($p<0.01$), which supports evidence for our claim that anger and irritation refer to the same underlying emotion. The same holds for happiness and joy (correlation coefficient of 0.94 ($p<0.01$)), and, although less strong, for envy and jealousy (correlation coefficient of 0.5 ($p<0.01$)).

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[12] The fact that some responders (6 out of 39) earned somewhat less than the take authorities does not change any of our predictions.

Table 2: Intensity scores of experienced emotions

Emotion	Responders who destroyed (n=8)		Responders who did not destroy (n=31)	
	mean*	stand. dev.	mean*	stand. dev.
Irritation	5.88	1.13	3.58	1.95
Contempt	5.25	1.28	2.42	1.86
Anger	4.00	1.51	3.32	2.04
Surprise	4.25	2.38	3.06	2.13
Envy	4.00	2.07	3.58	1.98
Jealousy	2.75	1.58	3.77	2.25
Sadness	3.00	1.60	2.87	1.84
Happiness	1.75	1.39	2.23	1.78
Fear	1.63	1.06	1.94	1.36
Joy	1.63	1.41	2.19	1.58
Shame	1.63	1.77	1.65	1.28

Note: * The intensity scale ranges from 0 (no emotion) to 7 (high intensity)

We now turn to our hypotheses. *Hypothesis I* concerns the relation between the take rate and the intensity of emotions. To investigate this hypothesis, we have estimated an ordered logit model for each emotion separately. The results are given in table 3. With regard to the negative emotions irritation, envy, and contempt, the estimated coefficients are all significantly positive. For anger, the coefficient is also positive but less significant ($p=0.13$). An increase in the take rate thus leads to a higher intensity of these negative emotions. With regard to the positive emotions happiness and joy, the estimated coefficients are significantly negative, which means that an increase in the take rate leads to a lower intensity of these emotions.

Table 3: Ordered logit estimates for each emotion

Dependent Variable	Explanatory Variable	Coefficient	P-value	Chi-square
Irritation	Take rate	0.058	0.000	17.50**
Happiness	Take rate	-0.048	0.001	12.41**
Joy	Take rate	-0.047	0.001	12.12**
Envy	Take rate	0.026	0.039	4.35*
Contempt	Take rate	0.031	0.062	4.11*
Anger	Take rate	0.020	0.126	2.33
Sadness	Take rate	0.015	0.227	1.50
Surprise	Take rate	-0.017	0.181	1.81
Shame	Take rate	-0.012	0.471	0.50
Fear	Take rate	-0.006	0.680	0.17
Jealousy	Take rate	0.002	0.887	0.02

Note: n=39; *p<0.05; **p<0.01

Hypothesis II states that the probability of destroying income depends positively on the intensity of negative emotions. To investigate this hypothesis, we used a binary logit model for each emotion

separately. The dependent variable "Destroy" equals 1 if a responder destroyed income, and 0 otherwise. The results are given in table 4. It turns out that only for irritation and contempt significant results are obtained. An increase in the intensity of these emotions significantly increases the probability that a responder will destroy income. Note that the effects for envy, happiness, and joy are not significant. Although the intensity of envy, happiness, and joy are related to the take rate , these emotions ultimately do not affect behavior. It is irritation and contempt that influence behavior. A Mann-Whitney test gives further support for this finding: responders who destroyed income experienced significantly more irritation and contempt than those who destroyed nothing.[13] With regard to the other emotions, differences in experienced emotion show no statistically significant effect on behavior.

Table 4: Binary logit estimates for each emotion

Dependent Variable	Explanatory Variable	Coefficient	Constant	Chi-square
Destroy (0 or 1)	Contempt	0.880**	-4.830**	13.12**
Destroy (0 or 1)	Irritation	0.953*	-6.075**	10.64**
Destroy (0 or 1)	Surprise	0.251	-2.273	1.88
Destroy (0 or 1)	Jealousy	-0.244	-0.563	1.54
Destroy (0 or 1)	Joy	-0.303	-0.786	1.01
Destroy (0 or 1)	Anger	0.186	-2.038	0.80
Destroy (0 or 1)	Happiness	-0.197	-0.966	0.56
Destroy (0 or 1)	Fear	-0.213	-0.978	0.40
Destroy (0 or 1)	Envy	0.111	-1.776	0.29
Destroy (0 or 1)	Sadness	0.042	-1.477	0.03
Destroy (0 or 1)	Shame	-0.011	-1.336	0.00

Note: The logit function is $f(x)=1/[1 + \exp-(a +bx)]$; n=39; *p<0.05; **p<0.01

To test the corollary of the previous two hypotheses, we used another binary logit model. *Hypothesis III* states that the probability of destroying income is positively related to the take rate . The results show that this is indeed the case (coefficient=0.14 and constant=-11.29, both significant at the 5% level).

Our last hypothesis concerns the amount of punishment. *Hypothesis IV (a)* states that if a responder destroys income, it will be a part. The alternative *Hypothesis IV(b)* states that if a responder destroys income, it will be everything. The latter hypothesis is supported by our data, since 7 of the 8 responders who destroyed income destroyed everything. This means that people under the influence of sufficiently strong negative emotions do not really `fine tune' their decision making and choose an extreme option.

Finally, we have investigated whether behavior or experienced emotion is influenced by gender, education (economics or not), or experience in economic experiments. It turns out that none of these factors have an effect on behavior or experienced emotions

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[13] The significance level is 0.004 for irritation and 0.001 for contempt, using a two-tailed test.

The role of expectations

Figure 2 provides some information about responder's expectations of the take rate in relation to the actual rates chosen by the take authorities. A proportion of the responders explicitly reported not to have any expectation. Consequently, the analysis of expectations that follows is based on a smaller number of observations (n=22). From figure 2 we see that for most responders expectations were not consistent with the actual take rate . Responders above the 45° line were too optimistic: they expected a lower take rate than the actual rate. Responders under the 45° line were too pessimistic: they expected a higher take rate than the actual rate. The figure also shows which responders destroyed income (squares). Interestingly, only responders who were too optimistic destroyed income.
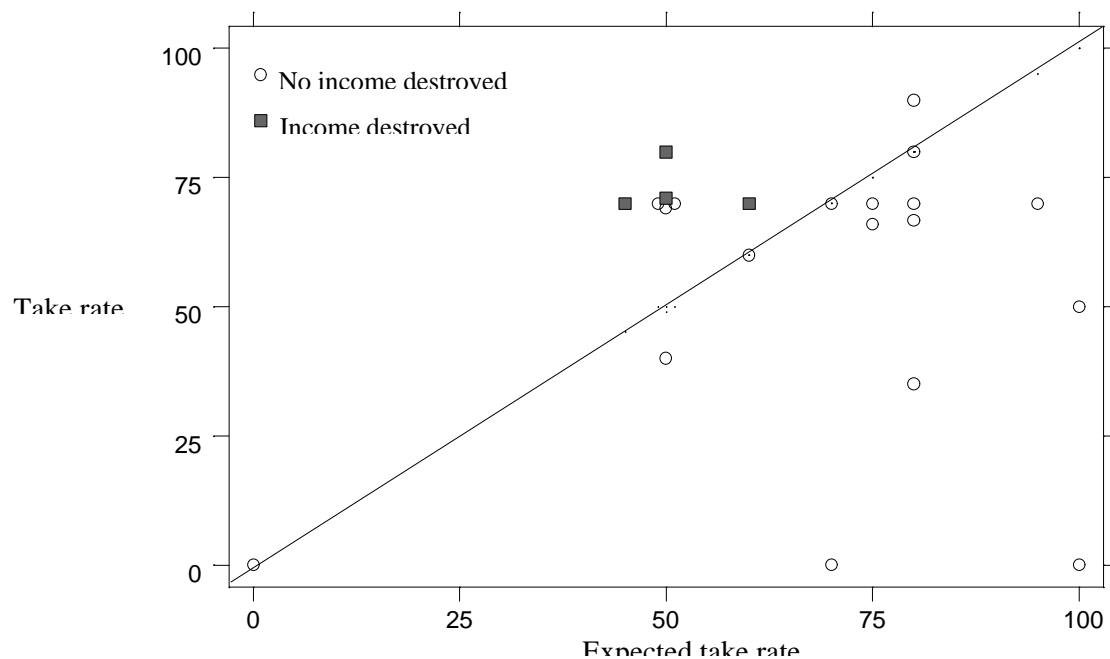

Figure 2: Scatter diagram of take and expected take rates

Because expectations were assessed after the take game, it is possible that responders who were too optimistic found it hard to admit that they were wrong. These responders may have been inclined to present themselves as realistic or perhaps even as pessimistic. Therefore, we check whether responder's expectations of the take rate are correlated to the take rate. It turns out that the correlation between the take rate and expected take rate is very low (correlation coefficient of 0.12) and not significant (p=0.60). From this we conclude that there is no systematic bias in responder's reported expectations of the take rate .

Next, we investigate whether expectations matter for the intensity of emotions. To do so we compare each model in table 3 with a model that includes both the take rate and the responder's expectation of this rate. Somewhat surprisingly, it appears that expectations have no predictive value for the intensity of the (negative or positive) emotions. We will return to this result below.

Finally, we analyzed whether expectations influence behavior. To that purpose, two logit models were estimated with "Destroy" again as the dependent variable (equal to 1 if a responder destroyed income, and zero otherwise). For both models the number of observations is smaller than the full sample, because we have only included those responders who explicitly reported an expectation. The regression results, given in table 6 below, show that the model (2) including expectations, is significantly better than model (1) which does not include expectations.[14] It thus appears that expectations influence behavior but not emotions. In the next section we will attempt to explain this rather surprising result.

Table 6: Comparison of logit models with and without the expected take rate

	Dependent Variable	Explanatory Variables	Coefficient	P-value	Log Likelih.
Model 1 (n=22)	Destroy (0 or 1)	Constant	−5.7518	0.1666	18.322
		Take rate	0.0639	0.2701	
Model 2 (n=22)	Destroy (0 or 1)	Constant	−3.3714	0.0600	11.000
		Take rate − expected take rate	0.1677	0.0665	
Model comparison	Significance of Log LR p< 0.01				

Note: The logit function is f(x)=1/[1 + exp-(a +bx)]

Motives reported by subjects

Finally, we want to give a short informal impression of the motives that subjects reported in the debriefing questionnaire for their decisions. Take authorities typically say that their objective is to maximize income. In general, they do not show much concern for the well being of the responders. That they do not choose an extremely high take rate is because they expect responders then to destroy their earnings.[15] Some take authorities suggest that a take rate of 50% is fair since they are in the position to

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[14] We have also estimated the coefficients of the take rate and expected take rate separately for model 2. The coefficient of the take rate is then equal to 0.17 (p=0.11) and the coefficient of the expected take rate -0.17 (p=0.08).

[15] On the one hand, we have found a positive correlation between the take rate and the reported probability that the responder will destroy a large share (50% or more) of income; on the other hand, there is a positive correlation between actual destruction and this reported probability.

take 100%. Others justify high take rates by saying that the responder would do the same in their position. But there are also take authorities who chose low take rates either because in their view they had no right to take from the income responders worked for, or because they were concerned with the income of the responders. Most of the responders indicate not to have destroyed their income because it would have cost them money. According to some the temptation to destroy their income was very great indeed, but because they desperately needed the money they destroyed nothing. Note that this is in line with the reasoning behind Hypothesis IV(b): the desire for money is greater than the desire for punishment and dictates the decision of the responder. In general, responders who actually destroyed their income indicate that a high take rate is very unreasonable, and that they do not want the take authority to have anything of their income.

5. Discussion of the results

In this section we first discuss the puzzling result that the expectations of responders appeared to significantly influence their behavior but not the intensity of emotions. Subsequently, we investigate to what extent existing economic models can explain our results.

Expectations

The impact of emotions on behavior can best be seen as the outcome of a process (see figure 1). The process starts with an event having consequences for one's interests. This directly causes an emotion, which is the urge to execute a particular form of action, a so-called action tendency. Whether or not an action tendency materializes into an action depends on how the individual handles or regulates the emotion. Regulation is a more deliberate process where the individual takes into account the consequences of carrying out an action tendency. Regulation can suppress as well as amplify emotional urges (Frijda, p. 401; Lazarus, p. 114). According to Frijda, social considerations (norms) play a very important role in the regulation process. Consider for example a married man who has romantic feelings for another woman. The action tendency of love is to approach the person one has feelings for. The married man, however, may not give in to his urges because of the social norm that says it is inappropriate for married people to have affairs. In this example the norm inhibits the action tendency. There are other instances where the norm augments or justifies the action tendency. For example, when one is intentionally injured or insulted, one should react to the person who is responsible. However, the response should be in line with the standard of what is appropriate in such a case, which may vary from community to community (see Averill 1982, for a discussion about social norms related to anger).

In section 3, we argued that there are two ways in which expectations can play a role in the emotion process. First, expectations may influence the intensity of experienced emotion because of an

"unexpectedness" effect. In our case, this effect does not seem to play an (important) role, since we have not found any significant relation between expectations and emotion. The second way is through regulation. It is our conjecture that expectations of the take rate are related to norms (standards) and influence decision making through regulation. Evidence from an empirical study on fairness in the market place by Kahneman et al. (1986) supports the claim that expectations are closely related to norms: "(…) the gap between the behavior that people consider fair and the behavior they expect in the marketplace tends to be rather small (p. 731)". Furthermore, they note that people agree on general principles of fairness but can have disagreement about specific cases.[16] This may explain the variation in the reported expectations of responders (see, figure 2). If the take authority violates the responder's norms, then the responder will judge this behavior as inappropriate.[17] This may justify or even amplify the action tendency to punish the take authority. When the individual has two conflicting motivations, which do not differ much in strength, the amplification of one motivation need not be large to cause a "jump" in behavior. This is suggested by our finding that the responder either destroys all income, or nothing. The strongest motivation seems to dictate behavior (cf. the discussion pertaining to hypothesis IV in section 2). This may explain our observation that expectations have no significant effect on the intensity of emotions but a significant effect on behavior. The amplification of the action tendency by the norm is too small to measure any additional effect on experienced emotion, but large enough to cause a "jump" in behavior by letting the motivation to punish dictate decision making.

Other theories

We now turn to the issue whether existing economic models of behavior are able to explain our experimental data. A first candidate is the standard game-theoretic approach, assuming rational self-interested behavior. This model predicts that the responder will not destroy any income if the take rate is less than 100% and is indifferent between all percentages of destruction if the rate is 100%. Since subjects have to choose integers in the experiment, there is a subgame perfect equilibrium in which the take authority selects a take rate of 99% and the responder destroys nothing, while the responder would destroy all income if the take rate were 100%. In addition, there are other subgame perfect equilibria in which the take authority chooses a take rate of 100% and the responder destroys with zero or some positive probability (such that the take authority does not want to switch to a take rate of 99%). A quick

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[16] It is possible that subjects are confused about which norm applies to the power to take game because of its abstract nature. This may explain why a substantial proportion of the subjects reported not to have any expectations.

[17] The bimodal distribution of the expectations suggests that two standards apply to the power to take game. First, a split-the-difference rule (27% expected a take rate of 50%), and, second, something like a split-the-difference `squared' rule (23% expected a take rate of 80%). The latter may have been activated by the following reasoning: Since a take rate of at least 50% should be feasible, the real issue is the appropriate take rate in the interval [50, 100]. Interestingly, only one subject expected a rate of 0%, at which both subjects would leave the experiment with the same earnings.

look at table 1 suffices to conclude that this model cannot explain our results.[18] Therefore, we next turn to economic models where it is assumed that individuals are not only motivated by their own payoffs.

One motive that is often referred to in the literature concerns altruism: People may be motivated by "taking pleasure in others' pleasure" (Dawes & Thaler, 1988). In our game altruism does not adequately describe behavior, since it cannot explain why responders destroy income.[19] Recently, some models have been developed where it is assumed that people may be motivated by considerations of fairness or equity. In one approach it is assumed that players are not only motivated by their own payoff but also by a `relative' payoff, measuring how their own payoff compares to that of the other player(s). Another approach assumes that players' concern with the distribution of payoffs depends on the intentions of the other player(s).[20]

The equity or inequality aversion model of Fehr & Schmidt (forthcoming) falls in the first category.[21] It is assumed that people exhibit inequality aversion and are willing to give up money in order to have less inequality. However, they show a self serving bias in the sense that they are prepared to give up more money to redress disadvantageous inequality than advantageous inequality. Applied to our power to take game, this model does not predict the behavior of take authorities very well. We observe much higher take rates than predicted by this model.[22] The behavior of responders is better predicted. According to this model responders will never destroy any income when the take rate is below 50%, and (generally) they will either destroy zero or one hundred percent of their income. These predictions are in line with our observations. Furthermore, the probability of punishment according to the model is roughly in line with our (logit) estimates of this probability. However, our finding that expectations have a significant impact on the probability of punishment is not captured by the model of Fehr & Schmidt, since expectations do not play a role in their model.

In the model of Fehr & Schmidt responders, in particular those types who very much dislike inequality, destroy income because it diminishes inequality. According to emotion theory responders punish because the action tendency to punish dominates other motivations, such as the desire for money. In the model of Fehr & Schmidt the marginal rate of substitution between punishment and income is always the same for a given type. Only those types that are willing to give up relatively much income for punishment will destroy income. Our findings suggest that, for a given individual, the marginal rate

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[18] The cooperative game model of Aumann & Kurz (1977), which was referred to in the introduction, is not very successful either, because it predicts a split-the-difference outcome (that is, a take rate of 50%) with no destruction of income.

[19] Another potentially relevant motive that is mentioned in the literature is envy (see, e.g., Feldman & Kirman, 1974). Although we indeed find a positive relationship between the take rate and envy (cf. table 3), there appears to be no effect of envy on the behavior of responders (cf. table 4).

[20] In addition to these approaches, Levine (1995) developed a model that incorporates both distributional and intentional concerns.

[21] A similar model in this category is that of Bolton and Ockenfels (1998).

[22] For example, the model of Fehr & Schmidt predicts that 40% of the take authorities will choose a take rate of zero percent. Furthermore, it is predicted that take authorities will never choose a take rate higher than 66.7%. In the experiment only 7.7% of the take authorities choose a take rate of zero percent and 48.7% choose a take rate equal to or higher than 70%.

of substitution between punishment and income depends on the intensity of experienced emotion. If the intensity is relatively low, the marginal rate of substitution is low as well. In this case the motivation "desire for money" dictates the decision. However, if the intensity is relatively high, the marginal rate of substitution makes a "jump" and becomes high as well. In this case the motivation to punish dictates behavior. Fehr & Schmidt do not model the behavioral processes underlying the preference for equity. Although this model captures an important aspect of emotions, the fact that people are willing to sacrifice resources to punish unfair behavior, other potentially important aspects are neglected. For example, individual emotions differ with respect to their eliciting conditions and action tendencies. Our results show that, in the power to take game, punishment is driven by irritation and contempt. In order to elicit these anger type of emotions in a person, it is necessary that another person harms the interest of this person *and* can be held responsible. In other words, intentions matter for these emotions, and, thus, for punishment. Although to date the experimental results on the role of intentions are somewhat mixed, there is evidence that intentional harm leads to more negative reciprocity than harm caused by nature (Blount, 1995; Offerman, 1998). Another important aspect of emotions is that they typically have a brief duration. The person under the influence of emotions may be viewed as having a short-term change of preferences (cf . Hirshleifer, 1987). The time constraint under which decision making takes place may thus affect behavior when emotions play a role.

The model of Rabin (1993) takes intentions into account. In this model it is assumed that people are willing to sacrifice their own material well-being to help those who are intentionally kind and to hurt those who are intentionally unkind. Whether or not person A perceives person B as intentionally kind or unkind depends on person A's second order beliefs, that is, A's beliefs about B's beliefs about A's strategy. In an equilibrium both players maximize utility and their higher order beliefs match to actual behavior. Since the model applies to games in normal form only, we can not directly apply it to our sequential take game. However, Duwfenberg & Kirchsteiger (1998) have adopted the model for sequential games. If we apply their model, then, for a certain range of take rates (above 50%), there can be multiple equilibria where responders destroy nothing, part, or everything of their income. Thus, according to this model it is possible that responders choose an intermediate amount of punishment. Our results, however, show that responders (almost) never choose this option. They either do not punish at all or choose the highest level of punishment. Moreover, we find that in fact if expectations deviate from reality, they have a significant effect on the probability of punishment. As holds for the model of Fehr & Schmidt this last result is not captured by the model of Rabin.

Furthermore, Rabin assumes that if the material payoffs become very large, players are no longer willing to sacrifice their own material well-being any more in order to punish (reward) unkind (kind) behavior. Although we have not tested what happens in the power to take game when the stakes are increased, it is questionable whether emotional urges only play a role when the stakes are low.

Experimental research on the ultimatum game by Slonim & Roth (1998) shows that even when the financial stakes are very high (62.5 times the hourly wage) subjects still behave reciprocally and reject unfair (but still substantial) offers. From the viewpoint of emotion theory this is not so strange. After all, emotions arise when one's interests are damaged. High stakes may therefore even increase the intensity of emotions. On the other hand, in that case the potential costs of carrying out an action tendency become high as well. The effect on behavior when stakes are increased thus depends on the balance of these two effects.

6. Conclusion

The aim of this study was to investigate the influence of emotions on economic decision making. To that purpose we used a simple power to take game, where two players first have to earn an (equal) income. In the first stage, one of them (the take authority) decides how much income to take from the income of the other player, the responder. In the second stage, the responder can punish by destroying part of his or her own income. In this study, we were primarily interested in the (emotional) behavior of the responder. First, we found that a higher take rate significantly increases the intensity of irritation, contempt, and envy, and significantly decreases the intensity of joy and happiness. Since negative emotions are experienced as painful, there is a direct hedonic impact. Second, only irritation and contempt have a significant effect on the probability of punishment. In other words, punishment seems to be driven by these two emotions. Third, there are discontinuous "jumps" in the behavior of responders. They either choose no punishment (destroy nothing) or the highest level of punishment (destroy everything). Thus, it appears that of the two conflicting motivations–a `desire for money' and a `desire for punishment'–the stronger motivation dictates the decision. Finally, we found no effect of the responders' expectations of the take rate on experienced emotions, but a significant effect on the probability of punishment. In the previous section we offered an explanation of this result in terms of norm-related regulation of emotions.

Our experiment demonstrates that emotions and norms can have an impact on behavior which is not accounted for by standard economic models. Since the power to take game captures important aspects of economic reality, as discussed in the Introduction, this is an important outcome. Some may argue that in our experiment the majority of responders did not destroy any income and thus behaved rationally. So, why pay so much attention to emotions? There are several reasons. First, the percentage of responders (21%) whose behavior was influenced by emotions is small but certainly not negligible. Second, our experiment shows that if emotions influence behavior, the impact can be quite substantial. So, even when the number of agents whose behavior is influenced by emotions is relatively small, the effect on aggregate can be quite large because of these agents' `extreme' choices. Third, because of the

hedonic impact of emotions, they may have to be accounted for in welfare analyses. Fourth, the amount of emotional behavior observed in our experiment may represent a lower boundary. Remember that subjects played the take game anonymously and were not able to identify one another. When people deal with each other face to face, emotions are likely to play a greater role because the situation is less abstract. Moreover, people can easily reinforce each other's emotions and get trapped in a downward spiral. A simple difference in opinion, for example, can easily turn into a heated debate. Fifth, a better understanding of the emotion process may provide a means to affect economic behavior. Our results, for example, suggest that responders' expectations of the take rate play a significant role. We argued that they influence behavior through the regulation of emotional urges. What people expect of others, however, depends on the institution they behave under. In our experiment, responders were on average too pessimistic, they expected higher take rates than the ones chosen by the take authorities. If responders were, for instance, informed about the take rates in other sessions, or if the game were repeated, different behavior might be observed. Related to this issue is that emotions may be an important mechanism to sustain equilibria that otherwise would not be sustainable (cf. Frank, 1988). In the power to take game, take authorities take the reaction of responders into account when choosing a take rate. They realize that the higher the take rate the more likely it is that responders destroy their income. To have emotions is thus an advantage for responders in the sense that it prevents take authorities from choosing (very) high take rates.

An important issue for future research is how emotions interact with social norms and the expectations that they generate. We have argued that norms may influence decision making through the regulation of emotional urges, but more research is necessary to substantiate this conjecture. Through the manipulation of information or the use of experienced subjects, further light may be thrown on this issue (cf. Roth & Schoumaker, 1983). Furthermore, it would be interesting to find out whether the "jumps' in responder behavior in our experiment can be observed in other experimental games as well. Also, to obtain further evidence on emotion, in addition to self-reports, it may be useful to measure emotions physiologically. Measures like heart beat, blood pressure, or the galvanic skin response may provide additional information about emotional activity (cf. Burnham, 1998).

The emotion process is clearly a very complex one. Many issues are still unresolved. Nevertheless, it appears that emotions play an important role as a determining factor of behavior, including behavior that we would classify as rational. Economist should therefore be interested to learn more about emotions. Our experiment demonstrates that emotions can be fruitfully studied in the economic laboratory. By doing so, we may get a better picture of the determinants of economic behavior, the welfare consequences thereof, and the ways to deal with it.

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Appendix

Instructions of the power to take game

Two phases
This part of the experiment consists of two phases. In phase 1 only participant A must make a decision whereas in phase 2 only participant B must make a decision. Every participant thus makes one decision.

Phase 1: participant A chooses percentage
In this phase, each participant A will be paired with a participant B. This will be done by letting participant A draw a coded envelope. With the help of the code only we know which seat numbers are paired. Both participant A and B are thus anonymous. The envelope contains a form which says how much participant B earned in part I of the experiment. Participant A must choose a percentage and fill this in on the form, together with A's own income from part I of the experiment. This percentage determines how much of participant B's income after phase 2 will be transferred to participant A. The percentage chosen by participant A must be an integer in the interval [0, 100].

When participant A has completed the form, it must be put in the envelope again. After this we will collect the envelopes en bring them to the participants B who are paired with the participants A by means of the code.

Phase 2: participant B chooses percentage
In this phase participant B has to fill in on the form which percentage of his or her *own* income from part I of the experiment will be destroyed. The percentage chosen by participant B must be an integer in the interval [0, 100]. The transfer from participant B to participant A will be based on the income of participant B that is left. Note that the transfer equals the percentage chosen by participant A of the income of participant B that is left after phase 2.

When participant B has completed the form, it must be put in the envelope again. After this we will collect the envelopes and bring them to the participants A who are paired with the participants B. Participant A will take note of the decision of participant B and, subsequently, puts the form back into the envelope. Finally, the envelopes will be collected for the payment procedure which will be clarified below.

Example how to determine one's payoffs
We will now give an example for the purpose of illustration. Suppose that in part I of the experiment participant A earned 15 guilders and participant B 12 guilders. In phase 1 of part II of the experiment, participant A decides that *60%* of the income of participant B will be transferred to him or her (participant A). In the second phase, participant B can destroy part or everything of his or her income from part I of the experiment. Suppose participant B decides to destroy zero percent of his or her income. The transfer from B to A is then equal to 7 guilders and 20 cent (60% of 12 guilders). The total payoff for B at the end of the experiment is equal to 19 guilders and 80 cent (namely, the show-up fee of 15 guilders plus the 12 guilders of part I minus 7 guilders and 20 cent of part II). The total payoff for A at the end of the experiment is equal to 37 guilders and 20 cent (namely, the show-up fee of 15 guilders plus 15 guilders of part I plus 7 guilders and 20 cent of part II)

Now suppose that in this example participant B had decided to destroy 50% of his or her income. In this case the transfer from B to A is only 3 guilders and 60 cent (namely, 60% of the remaining income of participant B after phase II, which is 60% of 6 guilders). The total payoff for A at the end of the experiment is equal to 33 guilders and 60 cent (namely, the show-up fee of 15 guilders plus 15 guilders of part I plus 3 guilders and 60 cent of part II) and for participant B 17 guilders and 40 cent (namely, the show-up fee of 15 guilders plus the 12 guilders of part I minus 9 guilders and 60 cent of part II (of which 6 guilders are destroyed and 3 guilders and 60 cent transferred)

In summary

In phase 1, each participant A will be paired with a participant B by drawing an envelope. The envelope contains a Form which states the income of participant B from part I of the experiment. Participant A fills in his or her own income from part I of the experiment and the percentage that indicates how much of participant B's income will be transferred to participant A after phase 2. When participant A has completed the form, it will be brought to participant B. In phase 2, participant B decides which percentage of his or her *own* income from part I of the experiment will be destroyed, and fills this in on the Form. Subsequently, the Form will go to participant A who takes note of the decision of participant B. Then, the Form will be collected and the payment procedure follows. Note, that the pairing is anonymous so that nobody knows whom he or she is paired with.

Other information

Completing the Form

The decision of both participant A and B will be filled in on a Form. You have received a specimen of this Form. In phase 1, participant A completes the blue block. In this block the income of participant B is stated. Participant A fills in his or her own income and the percentage. In phase 2, participant B completes the yellow block. In this block, participant B states which part of his or her own income will be destroyed. The Forms must be completed with the pen that you find on your table in the laboratory. If a Form has been completed with another pen, the Form will be invalid and you will not be paid. Finally, for making calculations you can make use of the electronic calculator that is on your table.

The payment procedure

When participant A has taken note of the decision of participant B in phase 2, the envelope containing the Form will be collected and brought to the cashier. Next, the participants will go to the reception room of the laboratory one by one. The cashier, who will not be present during the experiment, will pay the participants in the reception room. The cashier determines the payment of each participant with the help of the Form and the codes that are linked to the seats. In this way, anonymity is secured with regard to who earned what.

Exercises

We ask you to do two exercises on the computer in order to become familiar with the procedures. These exercises consist of completing the Form for an imaginary situation and determining the payoffs. You are not actually paired with another participant during these exercises. Your earnings in these exercises will not be paid out to you. When the exercises have been finished, the computers will be switched off and you again have the opportunity to ask questions. After this the experiment will start.

Finally

To secure anonymity, participants A and B will be partially divided by a sliding wall. The instructions on the table will be available to you during the experiment. At the end of the experiment you are asked to fill in a short questionnaire. Anonymity is again secured. After this, you are asked you leave the laboratory one by one. You must be silent and refrain from communication with others until you have left the laboratory.

Code: xxx

FORM

Participant A fills in this block:

Income of participant A from part I: ……….

Income of participant B from part I: xxx

I (participant A) decide that ………. % of the income of participant B will be transferred to me.

Participant B fills in this block:

I (participant B) destroy ………. % of my income of part I of the experiment.