Your Morals Are Your Moods*

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Abstract

We test the effect of players' moods on their behavior in a gift-exchange game. In the first stage of the game, player 1 chooses a transfer to player 2. In the second stage, player 2 chooses an effort level. Higher effort is more costly for player 2, but it increases player 1's payoff. We say that player 2 reciprocates if effort is increasing in the transfer received. Player 2 is generous if an effort is incurred even when no transfer is received. Subjects play this game in two different moods. To induce a 'bad mood', subjects in the role of player 2 watched a sad movie before playing the game; to induce a 'good mood', they watched a funny movie.

Mood induction was effective: subjects who saw the funny movie reported a significantly better mood than those who saw the sad movie. These two moods lead to significant differences in player 2's behavior. We find that a bad mood implies more reciprocity while a good mood implies more generosity. Since high transfers are relatively more common, player 1 make more money when second movers are in a bad mood.

Keywords: Emotions, motivation, rationality, reciprocity, fairness.
JEL codes: C73, C93, L83

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1 Introduction

The standard theory of agents' preferences has two fundamental assumptions: preferences are defined on one's own payoffs, and preferences are stable over time and environments. A large body of recent experimental evidence, however, calls into question the validity of the first assumption. For example, in ultimatum games and gift-exchange games, players do not maximize their monetary earnings.[1]

Factors like altruistic motives, aversion to inequity, or a preference for being treated kindly (and an aversion to unkind treatment) have been introduced to explain players' behavior in these experiments. Altruism and inequity aversion models use preferences that depend on one's own payoff *and* others' payoffs. For example, Fehr and Schmidt [19] and Bolton and Ockenfels [5] assume that some players have utility functions that include as arguments not only their own payoff but also a measure of the distribution of payoffs for all players in the game; in particular, players have an aversion to inequity. Reciprocity models use preferences that depend on one's own payoff *and* beliefs.[2] For example, Rabin [32] and Dufwenberg and Kirchsteiger [13] assume individuals like to return intentionally kind or unkind actions with actions of the same type.

These theories provide a general structure that encompasses independent (or 'selfish') preferences and interdependent (or 'moral') preferences. Some economists suggest that we can use these extended preferences to explain phenomena that previously seemed inexplicable. This is the argument pursued by Fehr and Gächter [15] and Fehr and Schmidt [20].

This line of research requires the assumption that moral preferences are stable. That is, they are invariant across different games, and restrictive enough to provide interesting predictions. This seems to be a reasonable and important requirement. In fact some scholars argue forcefully that stability is a necessary condition for a theory of behavior based on preferences to be interesting.[3] If moral preferences are stable, the research program based on selfish stable

[1] The recent literature on this topic is very large: see Andreoni [1] , Charness [9], Charness and Haruvy [11], Charness and Rabin [12], Fehr et al. [17] and [18]; Fehr and Gächter [16] provide a comprehensive survey.

[2] This approach uses psychological games as introduced by Geanakoplos, Pearce and Stacchetti in [22].

[3] For instance, in the words of Gary Becker:

preferences has indeed been extended for greater generality and empirical validity.

In this paper, we test whether moral preferences are stable with respect to a simple characteristic of the environment: players' moods. Our test consists of an experiment based on the gift-exchange game. This game is played by two individuals acting sequentially. The first mover has a sum of money and can transfer some of it to the second mover. The second mover receives the transfer and then chooses an effort level. Higher effort is more costly to the second mover, but it increases the first mover's payoff.[4] Using this game, altruistic behavior has been documented in a variety of different settings: second movers exert effort even when it implies a positive cost and no benefit.[5]

In our experiment, second movers' mood is manipulated. Before starting the gift-exchange game, we induce either a good mood or a bad mood. We then observe subjects' behavior. In both moods, and consistent with the existing literature, second movers display reciprocal behavior: effort is increasing in the transfer received. Players' choices, however, differ significantly across moods. In particular, when the transfer received is low, subjects in a good mood choose higher effort; when the transfer received is high, subjects in a bad mood choose higher effort. Since high transfers are relatively more common, this difference in effort yields the surprising conclusion that first movers who face subjects in a bad mood do better than first movers who face subjects in a good mood.[6]

These findings have clear implications for two fundamental aspects of moral preferences: reciprocity and generosity. The former is measured by the slope of the effort-transfer relation-

> "The assumption of stable preferences provides a stable foundation for generating predictions about responses to various changes, and prevents the analyst from succumbing to the temptation of simply postulating the required shift in preferences to "explain" all apparent contradictions to his predictions". Becker [2], Chapter 1.

See also Stigler and Becker [34].

[4] This game is first studied by Fehr, Kirchsteiger and Riedl [17], where it is part of a more complicated market game.

[5] For a survey of this evidence, see Fehr and Gächter [16] and Charness and Haruvy [11].

[6] This result is related to the findings in Bewley [4]: employers say they do not lower wages fearing the impact of employers' bad mood on productivity. A comparison is difficult because in our case the bad mood is exogenous to the relationship between players; in the case Bewley describes, it may be caused by one of them. See also Bosman and Winden [6] and Charness and Grosskopf [10] for attempts to analyze emotions and behavior in games.

ship, while the latter is measured by the intercept of this relationship. Generosity corresponds to effort incurred even when no transfer is received, while reciprocity corresponds to higher effort incurred to reward a larger transfer. Reciprocity and generosity differ between subjects in a good mood and in a bad mood. In particular, when second movers are in a bad mood, reciprocity is higher, and generosity is lower. We find that moral behavior changes in response to exogenously induced moods. In other words, your morals are your moods. This observation may be disturbing in itself. In addition, the assumption underlying the line of research described above must be reconsidered. Moral preferences are not stable: they change with a player's mood.

Psychology offers a different setting to put the results we report into context. A large literature studying mood and behavior finds, with few exceptions, a positive correlation between good moods and helping.[7] The relationship we find between bad moods and reciprocity is not inconsistent with these findings. Since helping behavior is distinct from reciprocal behavior, we present a novel extension of the implications of mood on behavior. These results make clear that altruism is not a well-defined concept if it is taken in absolute terms, independently of a person's mood.

Psychologists' views of the evidence that moods affect behavior are based on cognitive interpretations of the role of moods and emotions. The idea of priming, for example, is used to explain why helping behavior is more frequent in subjects in a good mood. An individual in a good mood expects a more pleasant experience from social interaction, and is therefore more willing to help. A second, related, idea is mood maintenance. Current happiness depends on present actions and past happiness. Higher past happiness implies higher current happiness. In this setting, individuals in a good mood try to maintain their mood, while individuals in a bad mood try to change their mood. Under appropriate conditions, the optimal way to achieve this target when in a good mood turns out to be helping behavior.[8]

Looking at these results, perhaps a different foundation for moral behavior should be con-

[7] For a review, see Carlson et al. [7], Morris [29], and Isen [27].

[8] Substituting "utility" for "happiness", this is the point made in Hermalin and Isen [24].

sidered: a foundation able to explain the role of moods, and the twin concept of emotions, in behavior. For example, moods and emotions can be incorporated into a theory of behavior, similar to the way altruism and reciprocity have been. In particular, an individual's utility function can depend on mood. In our view, this extension does not seem promising for two reasons. First, it leads research into a vicious circle with theory trying to catch up with experimental evidence.[9] Second, it increasingly leads into causal, immediate, explanations of behavior: we act in a certain way because we have preferences, or norms, or now moods that motivate these actions. A different type of explanation is a functional one, based on the advantage, in terms of fitness (defined by biological or cultural factors), of a behavior.

The explanations of reciprocity provided in many of the papers quoted earlier are causal, not functional. These causal explanations (like the standard utility maximizing explanation in different settings) are not compatible with the environment's effect on behavior that we find here.[10] We find that the intensity of reciprocity is smaller when subjects are in good mood. This result seems to require a new look at the cognitive theories explaining the connection between altruism and moods, or emotions. This should be the subject of further experimental and theoretical research

The reminder of the paper is divided as follows. Section 2 presents the experimental design in detail, including the mood induction procedure. Section 3 presents the empirical results and measures the effect of mood on behavior. Section 4 concludes.

2 Experimental Design

Each experimental session consisted of several rounds of a gift-exchange game. The rounds were preceded by a mood-induction phase involving a subset of the subjects.

The game has two stages. In the first stage, player 1 receives a fixed monetary amount and can transfer some of it to player 2. In the second stage, player 2 learns the transfer and then

[9] A similar point is made by the citation in footnote 3.

[10] A similar inconsistency is found in another paper, by two of us, which tries to assess the importance of emotional factors in the performance of soccer teams, see Palomino et al. [31].

decides an effort level. Effort is costly to player 2 but beneficial to player 1.[11] In particular, for any given transfer higher effort reduces player 2's payoff but increases player 1's payoff.

Let t denote the transfer chosen by player 1 and e denote the effort chosen by player 2. t can be any integer between 0 and 15, while e is a fraction between 0.1 and 1. Then, players payoffs are given by the following:[12]

$$P_1(t,e) = (15 - t)e$$

for player 1, and

$$P_2(t,e) = t - c(e)$$

for player 2. The cost function $c(e)$ is increasing, convex, and it ranges between 0 and 3.6; its precise values are:

e	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
$c(e)$	0.0	0.2	0.4	0.8	1.2	1.6	2.0	2.4	3.0	3.6

Subjects play this game for a fixed number of rounds. During all rounds, each subject maintains the role of player 1 or player 2. The matching follows a round robin procedure, so that a subject plays exactly once with each possible different partner. Therefore, the number of rounds depends on the number of subjects in a session. We had sessions with 16, 14, 12, and 10 players, corresponding to 8, 7, 6, and 5 rounds respectively.

The only information players receive is the play of their counterpart in a round.[13] The matching is anonymous. Furthermore, players cannot observe the action of other pairs, or the actions of their partner in previous rounds.

At the beginning of a session, the role of player 1 or 2 is assigned randomly and subjects are then provided with the instructions. These are read aloud by an experimenter in front of all participants. Then subjects answer a control questionnaire to check their understanding of

[11] In the instructions, we use the term "conversion rate" to avoid negative perceptions. Here, we revert to the more intuitive name "effort".

[12] The unit of account is the Dutch Guilder; it was worth approximately half a US dollar when the experiment took place.

[13] This information is written on the 'play sheet' by one of the two experimenters that are present.

game and the way the payoffs are determined. The complete instructions and the questionnaire are reported in the Appendix.

At this point, the mood induction phase begins. Subjects are told that players 2 will watch a short sequence from a movie; therefore, players 1 leave the room to make this possible. This phase has two different treatments. The subjects watch a sequence from either *Schindler's List* directed by Steven Spielberg, or from the movie *City Lights* directed and interpreted by Charles Chaplin.[14] The sequence from the first movie is the "liquidation of Krakow ghetto". It shows the Nazi troops surrounding the ghetto, making prisoners or killing Jews. The second sequence is the "boxing fight". An hilarious episode with Charlie Chaplin dancing around the ring to avoid to punches of his opponent. A more detailed description of the two sequences is also in the Appendix.

At the end of the movie, subjects answer a brief questionnaire related to the movie and their mood. Players 1 then come back into the room and the gift exchange game starts.[15] After the game is played, all subjects answer a second brief questionnaire also aimed at collecting information about their mood. Both questionnaires are reported in the Appendix. At this point all subjects are paid, privately and in cash, the amount won in each round they played.

2.1 Analysis of the game

The gift exchange game has a unique sub-game perfect equilibrium (SPE). In the second stage, player 2 chooses the minimum effort. Anticipating this strategy, player 1 chooses the minimum transfer. Hence, the only sub-game perfect equilibrium is an initial transfer $t = 0$, and an effort $e = 0.1$ independent of the transfer of the other player.[16] Players play the SPE only if they are

[14] Before the projection they were only informed that they were going to watch a five minutes sequence from a movie. They were not told which movie they were about to see.

[15] Subjects acting as players 1 waited outside the room while the movie was shown. We made sure that no communication took place during this time. They were not told which movie players 2 had seen.

[16] This outcome yields the lowest sum of payoffs for the players. Since this sum is equal to

$$15e + t(1 - e) - c(e),$$

the pair that maximizes it is minimum effort and maximum transfer, that is $e = 0.1$ and $t = 15$.

selfish; that is, if they care only about their own earnings. However, abundant experimental evidence shows that many subjects do not simply maximize their monetary payoffs: player 2 chooses $e > 0.1$ and there is a positive relationship between e and t. A variety of different theoretical approaches have been developed to capture these additional motives.

In models of *altruism* the consumption, or income, of another person enters as a good into the utility function of the decision maker (see for example Andreoni [1]). Therefore, player 2 in a gift exchange game chooses an effort above the minimum level if his altruism is strong enough. Furthermore, if 1's earnings are a normal good for 2, models of altruism predict a positive relation between t and e (except for very high transfer levels).

In models of *fairness* the preferences of the agents depend on their own earnings as well as on the fairness of the whole distribution. In Fehr et al. [18] and Fehr and Schmidt [19], a player 2 who has received a large enough transfer chooses an effort above the minimum level. The idea is that player 2 is willing to incur some cost to decrease the inequality of payoffs. The effort is always chosen such that player 2's earnings are larger than player 1's earnings, since player 2 is also motivated by self interest and does not aim at perfect equality. In Bolton and Ockenfels [5], player 2 goes for perfectly fair outcomes whenever possible.[17] For a given t, e solves the equation:

$$(15 - t)e = t - c(e);$$

totally differentiating this expression one finds a positive relation between transfers and effort.[18]

Finally, *reciprocity theories* are based on the idea that individuals want to return positive and negative favors (see Rabin [32] and Dufwenberg and Kirchsteiger [13]).[19] Since in these models individuals like to return kind and unkind actions with actions of the same type one needs to evaluate an action's kindness. Individuals take intentions into account. Hence this

[17] That is, in the range of transfers for which fair outcomes exist.

[18] Charness and Rabin [12] also develop a fairness model. In their version, players take into account distributional concerns with a specific focus on the individual with the smallest payoff.

[19] Rabin [32] develops a theory of reciprocity in normal form games. This model provides different predictions for the gift exchange game since, as any normal form concept, it cannot take into account the game's sequential structure. Dufwenberg and Kirchsteiger [13], on the other hand, develops a theory of reciprocity in extensive form games.

framework is very different from fairness and altruism theories since in those models only the final distribution enters the analysis. Nonetheless, reciprocity considerations lead to similar predictions in the gift exchange game. By making a large transfer, player 1 does player 2 a favor. Hence, the latter wants to reciprocate by choosing an e above the minimum level. Furthermore, the larger the transfer, the larger the favor, and the more player 2 is willing to spend to do player 1 a favor in return. Hence, reciprocity consideration also lead positive relation between t and e.

Summarizing, experiments show that frequently players do not maximize their monetary payoffs. Many theoretical models interpret this evidence assuming that players' behavior is motivated by a desire for fairness, altruism, and reciprocity. In other words, these theories suggest that individuals do not only care about narrow self-interest: moral norms shape their behavior.

3 The evidence from the experiment

The experiment took place at the University of Tilburg, The Netherlands, in June 1999 and May 2000. The subjects were 130 undergraduate students (of which 46 were female), recruited with an advertisement in the campus newspaper. We had 10 sessions, 5 per each mood induction procedure, with a number of subjects per session varying between 10 and 16. Overall, the data consist of 437 observations.

We begin with a very brief description of the aggregate results (this is an *average* over the two treatments). These do not differ substantially from those in the gift-exchange literature. We next analyze the effect of the mood induction procedure. The result is that different moods induce different behavior in the game. This difference is first assessed in non-parametric terms, and then measured more precisely using regression analysis. Throughout, the focus of our analysis is the behavior of the players who participated in the mood induction phase; that is, we analyze the behavior of players 2. Players 1 behavior is influenced by the mood induction stage only if players 2 behavior is.

3.1 Aggregate data

The histogram in Figure 1 reports the number of times each pair transfer-effort was observed. The pair $(t = 0, e = 0.1)$, corresponding to the unique sub-game perfect equilibrium of the game, is the most frequent. It is observed in 42 cases, which represent less than 10% of our observations.[20] Players 2 did not always choose the minimum effort level and players 1 frequently chose a positive transfer.

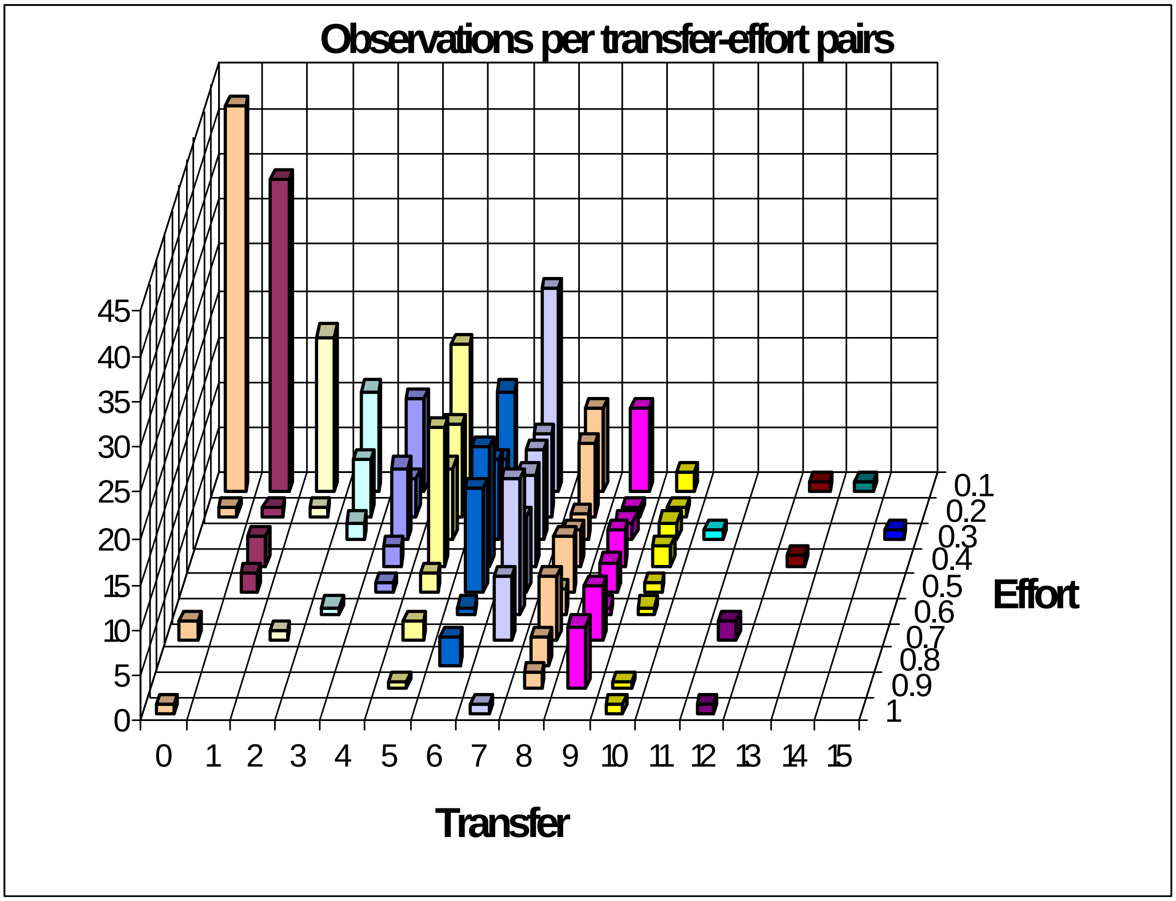


Figure 1: Distribution of choices

[20] For a table reporting the entire data, see Section A.1 in the Appendix.

Table 1 shows aggregate statistics for the experiment. The average transfer of player 1 was 5.2, while the average effort of player 2 was 0.3.[21] The average payoffs for players 1 and 2 were equal to 2.6 and 4.6 respectively. Players 2 do not always maximize their monetary payoffs. They choose minimal effort in 185 (corresponding to 42 per cent) of our observations. In the remaining cases, they sacrifice part of their achievable payoffs to the advantage of players 1. The cost to transfer ratio, defined as $CT = \frac{c(e)}{t}$, is a possible measure of this phenomenon. In the outcome of the game where the transfer is zero the ratio CT is not well defined since player 1 's optimal transfer is zero. In the remaining observations, however, the cost-to-transfer ratio averages 0.1, so players 2 sacrifice about 10 per cent of their potential earnings.

Table 1: summary statistics for transfer, effort, and cost to transfer ratio.

	Transfer		Effort		CT ratio		Payoff 1		Payoff 2	
Round	All	1^{st}	All	1^{st}	All	1^{st}	All	1^{st}	All	1^{st}
Average	5.206	5.385	0.300	0.305	0.108	0.112	2.611	2.729	4.604	4.815
Std. Dev.	3.08	2.36	0.23	0.20	0.16	0.16	1.86	1.62	2.82	2.16
Minimum	0	0	0.1	0.1	0	0	0	0.6	-3.6	0
Maximum	15	12	1	0.8	1.2	0.8	15	7.2	14.6	10

The data we have just seen do not differ substantially from the known results of gift exchange experiments.[22] Players do not play according to the SPE, and are better off because of that. Our data also display the typical ‘reciprocity’ relationship between effort and transfer: The effort chosen by the second mover increases with the transfer received. This can be seen in Table 2 which presents, for each transfer received, the average and median effort choices of players 2. From this table, one can also see how high transfers were extremely unlikely; players 1 chose transfers larger than 10 in less than 2 per cent of observations.

[21] Actions taken in successive rounds may depend on previous play. So we report the statistics for the first round of play separately. There seems to be no significant difference between these observations and the entire data set.

[22] For this evidence, see Fehr at al. [17] and [18], Charness [9], and Charness and Haruvy [11].

Table 2: effort by transfer: average, standard deviation, and median.

		Transfer									
		0	1	2	3	4	5	6	7	8	9
	N	46	40	19	20	25	54	54	82	45	33
Effort	Mean	0.148	0.145	0.137	0.175	0.220	0.283	0.346	0.365	0.420	0.482
	std.dev.	0.18	0.12	0.14	0.12	0.12	0.18	0.18	0.22	0.26	0.32
	Median	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.35	0.4	0.5
				10	11	12	13	14	15		
	N			11	1	3	2	1	1		
Effort	Mean			0.436	0.300	0.800	0.250	0.100	0.300		
	std.dev.			0.30		0.17	0.21				
	Median			0.4	0.3	0.7	0.25	0.1	0.3		

3.2 Mood induction

First, we show how the mood of subjects is affected by the movie; and how this change goes in opposite directions in the two treatments. This step is necessary to establish that a difference in behavior among the two treatments is a consequence of the subjects' mood, as manipulated by the experimenters.

One measure of mood induction is obtained analyzing how subjects describe their own mood. After seeing the movie, but before playing the game, second movers answered a brief questionnaire. One question asked was "How do you feel?".[23] Subjects could choose along an 8-point scale ranging from "1: extremely happy, in a really good mood" to "8: extremely unhappy, in a really bad mood". The average answer in the good mood treatment is 5.6 (with a standard deviation 1.6), while it is 3.1 (standard deviation 1.3) in the bad mood treatment.

[23] The entire questionnaire is found in Section A.2.

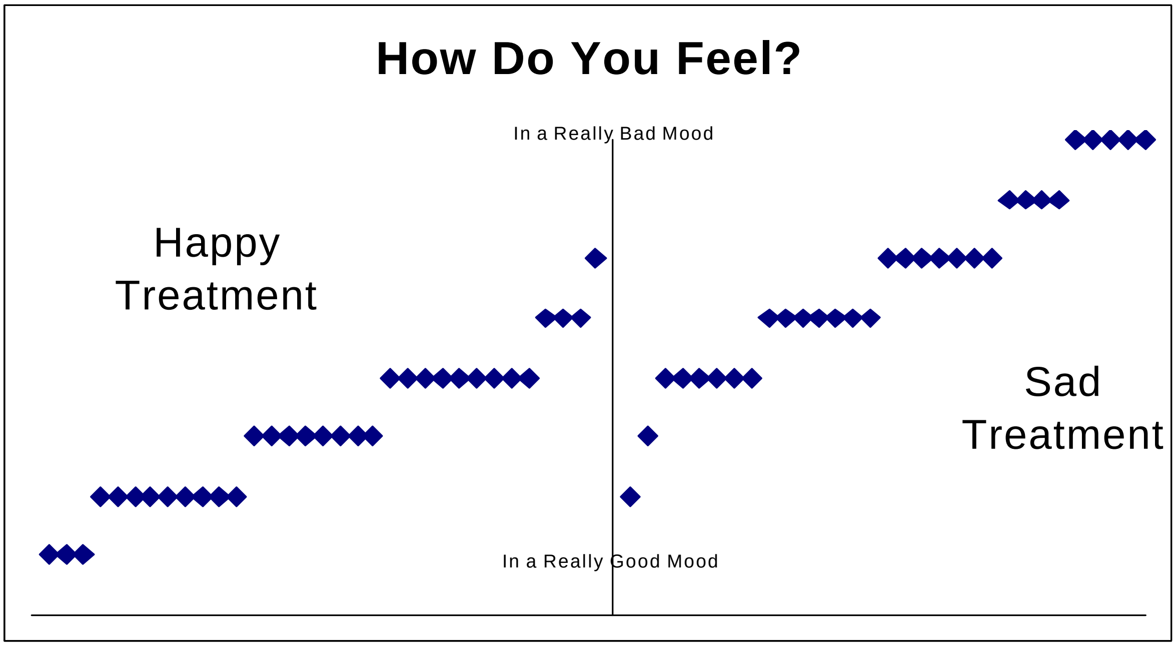


Figure 2: Questionnaire Answers by Second Movers

Figure 2 shows each individual's answer to the question "how do you feel?". Along the horizontal axes are individuals: on the left side the ones in the good mood treatment, on the right side the ones in the bad mood treatment. Along the vertical axes, higher points correspond to worse self-reported mood post-movie questionnaire. Visually, the distribution of answers in the right side of the graph appears higher than the distribution of answers in the left side. This suggests the distribution of moods reported by subjects in the bad mood treatment displays worse moods.

This visual impression is confirmed by a non-parametric test. Using the Mann-Whitney procedure, we can test the null hypothesis that self-reported moods are drawn from the same distribution in the two treatments. The Mann-Whitney statistic equals 5.403, and it implies a p-value smaller than 0.0001. Therefore, at least in a relative sense, subjects who saw the sequence from *Schindler's List* felt in a negative mood while subjects who saw the sequence for *City Lights* felt in a positive mood.

As time goes by and, perhaps more importantly, as the subjects take part into the experience of playing the game, the effect of mood induction fades away. When testing the same null hypothesis, equality of the distributions of answers to the same "how do you feel?" question with answers subjects gave after the game was played, we find a Mann-Whitney statistic equal to 0.296 which implies a p-value of 0.7675.

Finally, we can compute the difference between how subjects feel right after the movie and how they feel right after the game. This variable measures how their mood changed during the game: it is negative if they feel worse and positive if they felt better. The average for good mood subjects is -0.8, while it is 1.9 for bad mood subjects. The Mann-Whitney statistic, equal to 4.535 for a p-value less than 0.0000, confirms this difference. Using the Wilcoxon signed-rank test for matched-pairs, we can directly test if subjects answer the question differently before and after playing the game. The statistic equals 4.379 for bad mood subjects (p-value smaller than 0.0001) and -1.453 (p-value of 0.1461) for positive mood subjects. To conclude: there is very strong evidence that bad mood subjects felt better after the game. There is also evidence, although weaker, that good mood subjects feel worse.

3.3 Mood and behavior: summary statistics and nonparametric tests.

Having verified subjects do indeed feel, or at least say they feel, differently as a consequence of the mood induction procedure, we now study their choices. The starting point are the same summary statistics presented for the overall game. As before, and for the same reason, we also report statistics for the first round of play. The overall values presented in Table 3 appear similar, with transfer and effort both slightly larger in the bad mood treatment.

The difference between the two moods becomes clearer once we look at effort choices by transfer in Table 4. At low transfers, effort is higher when players are in a good mood; at relatively large transfers, effort is higher when players are in a bad mood. Very large transfers, larger than 10, are extremely unlikely and happen only in the good mood treatment. These first

Table 3: summary statistics by mood.

		Round	Transfer All	Transfer 1^{st}	Effort All	Effort 1^{st}	CT ratio All	CT ratio 1^{st}
Good Mood	Mean		5.068	5.382	0.283	0.282	0.110	0.116
	std.dev.		3.32	2.55	0.24	0.22	0.19	0.20
Bad Mood	Mean		5.372	5.387	0.322	0.329	0.105	0.108
	std.dev.		2.76	2.17	0.22	0.18	0.10	0.08

		Round	Payoff 1 All	Payoff 1 1^{st}	Payoff 2 All	Payoff 2 1^{st}	N All	N 1^{st}
Good Mood	Mean		2.498	2.503	4.508	4.865	238	34
	std.dev.		2.08	1.84	3.12	2.36		
Bad Mood	Mean		2.747	2.977	4.720	4.761	199	31
	std.dev.		1.54	1.31	2.43	1.96		

rough statistics seem to hint at a substantial difference in behavior between the two moods. At this point, however, we do not know whether the difference is significant. More refined tests are necessary, beginning with non-parametric tests of equality of distributions, and are presented next.

Unless otherwise noted, all the nonparametric tests use the Wilcoxon-Mann-Whitney statistic which is approximately normally distributed. Table 5 reports zs and p-values for these test. They correspond to two-samples tests which all have the same null hypothesis H^0: the distribution that generates data in the good mood treatment is the same distribution function that generates the data in the bad mood treatment.

In the first period of play the behavior of the players 1 is not significantly different across moods. This is reasonable, since they were not subject to the mood conditioning procedure.

Table 4: effort by transfer and mood: mean, standard deviation, and median.

		Transfer									
		0	1	2	3	4	5	6	7	8	9
Good Mood	N	31	22	12	11	13	33	28	33	22	17
	Mean	0.168	0.177	0.15	0.145	0.238	0.279	0.314	0.300	0.364	0.494
	std.dev.	0.22	0.15	0.17	0.07	0.13	0.20	0.20	0.26	0.29	0.26
	Median	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.5
Bad Mood	N	15	18	7	9	12	21	26	49	23	16
	Mean	0.107	0.106	0.114	0.211	0.2	0.29	0.381	0.408	0.474	0.469
	std.dev.	0.03	0.02	0.04	0.16	0.11	0.13	0.16	0.19	0.22	0.36
	Median	0.1	0.1	0.1	0.2	0.15	0.3	0.4	0.4	0.5	0.45

		10	11	12	13	14	15
Good Mood	N	8	1	3	2	1	1
	Mean	0.475	0.300	0.800	0.250	0.100	0.300
	std.dev.	0.33		0.17	0.21		
	Median	0.35	0.3	0.7	0.25	0.1	0.3
Bad Mood	N	3	0	0	0	0	0
	Mean	0.333					
	std.dev.	0.21					
	Median	0.4					

Table 5: Wilcoxon-Mann-Whitney non parametric tests; H^0 is equal distributions between good and bad mood data.

	Effort		Cost to transfer ratio		Transfer	
	All rounds	First round	All rounds	First round	All rounds	First round
z	2.576	1.681	2.317	1.897	1.387	0.354
p-value	0.0100	0.0927	0.0205	0.0578	0.1654	0.7232

	Payoff 1		Payoff 2	
	All rounds	First round	All rounds	First round
z	2.921	1.920	.893	-0.112
p-value	0.0035	0.0548	0.3717	0.9110

The behavior of players 2, however, is significantly different across moods. The test yields a p-value around 0.09 for effort and 0.06 for cost to transfer ratio. The latter is particularly important since it incorporates player 2s reactions to the transfer received. These effect become even more significant when we consider the whole sample. The hypothesis that the observed sample of efforts comes from the same distribution under good and bad mood can be rejected strongly; the same conclusion applies to cost-to-transfer ratios. Interestingly, the behavior of players 1 appears weakly affected by players 2 mood (p-value 0.16). This effect is not unexpected. If one considers roles instead of individuals the game is played repeatedly. Then, second movers can influence the choices of first movers. Therefore, if the mood of the second movers influences their choices, it also influences the choices of first movers.

We noted earlier that Table 4 displays a positive relationship between effort and transfer which appears to be different across the two moods. In the Appendix, we present a very ambitious non-parametric test about the distribution of chosen efforts for each transfer level. The tests are not always very powerful since some transfer levels are not chosen very often.

Still, one observes that when the transfer equals 1, 6, 7, or 8 there is a significant difference in behavior across moods.[24] When the transfer is 1, the effort chosen by individuals in a good mood is higher; when the transfer is 6, 7, or 8, the effort chosen by individuals in a bad mood is higher.

Table 6: average payoffs by transfer and mood.

		Transfer										
		0	1	2	3	4	5	6	7	8	9	10
Good	Payoff 1	2.52	2.43	1.95	1.74	2.62	2.79	2.83	2.40	2.54	2.96	2.37
Mood	Payoff 2	-0.24	0.78	1.83	2.91	3.68	4.50	5.40	6.37	7.14	7.73	8.75
Bad	Payoff 1	1.60	1.48	1.49	2.53	2.20	2.90	3.43	3.26	3.32	2.81	1.67
Mood	Payoff 2	-0.01	0.99	1.97	2.71	3.78	4.51	5.21	6.10	6.85	7.70	9.33

The importance of these differences across moods becomes even more evident when looking at players' payoffs by transfer and mood, as presented in Table 6. Transfers equal to 6, 7 or 8 are chosen in 50% of all negative mood observations and 35% and of all good observations; furthermore, a transfer equal to 7 constitutes the mode in both treatments. In these cases, the effort chosen by player 2 has a significant and sizeable impact on payoffs. Consider a player 1 who has chosen a transfer equal to 7. If she faces a good mood opponent, her average payoff equals 2.4; if she faces a bad mood opponent, her average payoffs equals 3.26. This constitutes an increase in payoff of 36%. Differences of similar magnitude are obtained for transfers equal to 6 or 8 (21% and 31% respectively). Therefore, a difference in moods implies not only a statistically significant difference in effort, but also a large difference in opponents' payoff.

Another test on the difference between good and bad mood choices can be carried through using the standard deviation of effort choices for each transfer level. This series is displayed

[24] See Table A-2 in Section A.1.

in Table 4, and seems to suggest a higher standard deviation of effort for individuals in a good mood. The Wilcoxon-Mann-Whitney test yields a z value of -1.651 (p-value 0.0987) and confirms the visual impression that these series are indeed different.[25]

3.4 Regression analysis

In this section we measure more explicitly how the behavior of player 2 depends on his mood. This dependence can take place in two different ways. First, the behavior of the player 2 may differ in the two different moods regardless of what players 1 does. Second, player 2 may react to the choices of players 1 differently depending on mood. The analysis below shows these effects are both strong and significant.

The first step is to build a regression model to estimate these effects appropriately. Let e_{ir} be the effort chosen by the i^{th} subject in the role of player 2 after seeing transfer t_{ir} of the player 1, who was the partner of i in round r. We estimate the following model:

$$e_{ir} = \alpha + \beta X_{ir} + \nu_i + \varepsilon_{ir}, \tag{3.1}$$

where X_{ir} is a vector of independent variables, ν_i represents unobserved characteristics of individual i, and ε_{ir} is an error term with the usual properties. One can estimate equation (3.1) under two different sets of assumptions. If we assume the variables ν's are random, with mean zero, uncorrelated with X and ε, then we have the *random-effects model*. If we assume the ν's are constant parameters, we have the *fixed-effects model*. The choice between these models may depend on the actual right hand side variables employed.

Our regressors are the following. *Transfer*, a variable equal to the transfer t_{ir} player 2_i receives before choosing effort e_{ir}; *Good Mood*, a dummy variable equal to one if i was in the good mood treatment and zero otherwise; *Good Mood* multiplied by t_{ir}; *Female*, a dummy variable equal to one if i is female and zero otherwise; *Female* multiplied by t_{ir}; *Transfer* ≤ 2

[25] This result is in line with some studies in psychology; they have suggested that different moods may influence the volatility of players' choices (see Hertel and Fiedler [25] and Hertel et al. [26]). In particular, individuals in a good mood display more erratic behavior.

and *Transfer* $= i$, with $i = 10, 11, 12, 13, 14, 15$, dummy variables equal to one when t_{ir} has the appropriate value and zero otherwise. The non parametric tests of the previous section point to differences in behavior across moods which should be reflected in the coefficients of the variables *Good Mood* and *Good Mood* $\times$ *Transfer*. Players' gender is the only observed individual characteristic we can include in the estimation.[26] The transfer variables are included to account for possible non linearities in the data at low and high transfer levels.[27]

Modelling ν_i carefully is important for two reasons: first, individuals may have different preferences, and they may behave differently in the game; second, individuals may react in different ways to the mood induction procedure. Introducing individual effects we measure systematic properties of behavior, which may be induced by moods. The two estimation procedures are, in this respect, very different. The random effect estimator is appropriate only when there is no correlation between X and ε; otherwise the fixed effect model is necessary. The fixed effect estimator, however, cannot estimate some of the regressors in which we are interested.

This last point can be seen easily. For any variable z_{ir}, let individual and overall means be defined as

$$\overline{z}_i = \frac{\sum_{r=1}^{R} z_{ir}}{R} \text{ and } \overline{z} = \frac{\sum_{i=1}^{I} \overline{z}_i}{I}.$$

Equation (3.1) implies

$$\overline{e}_i = \alpha + \beta \overline{X}_i + \nu_i + \overline{\varepsilon}_i \tag{3.2}$$

and

$$\overline{e} = \alpha + \beta \overline{X} + \overline{\nu} + \overline{\varepsilon}. \tag{3.3}$$

If we subtract equation 3.2 from equation (3.1) and then add equation 3.3 we get

$$e_{ir} - \overline{e}_i + \overline{e} = \alpha + \beta \left(X_{ir} - \overline{X}_i + \overline{X} \right) + \overline{\nu} + \varepsilon_{ir} - \overline{\varepsilon}_i + \overline{\varepsilon}. \tag{3.4}$$

[26] There are 25 female Player 2, 11 in the good mood treatment and 14 in the bad mood. These numbers correspond to 32% and 45% of the respective populations. Therefore the distribution of genders was slightly different across moods.

[27] The 'small transfer' dummy tries to measure if Players 2 chose the lowest effort unless they receive a big enough transfer. The 'high transfer' dummies are included because large transfer are very infrequent, particularly in the bad mood treatment.

Estimation of equation (3.4) is equivalent to estimation of equation (3.1). The advantage is that the ν_is have dropped out and one need not worry about unobserved individual effects. This fixed effect estimator, however, cannot estimate variables in X that do not change with the round index r, *Good Mood* and *Female* in our case, since they are perfectly collinear with the constant in equation (3.4). It can only estimate their interactions with *Transfer*.

Summarizing, there is a trade-off between a more precise evaluation of the effect of the mood induction procedure and the risk of assuming incorrectly that ν_i, the X and ε are uncorrelated. If they were, on the other hand, the fixed effect estimator would still provide the right answer since it does not depend on the individual effects. Table 7 below reports the results for both procedures. They do not appear systematically different, which makes us favor the random effect specification since it includes all the regressors of interest.[28] The comments below, then, pertain to the random effects model unless specified. We also used different specifications, including ordered probit and tobit, to account for particular features of our data. They all yield results very similar to the ones described below, and are available upon request.

The constant is not significantly different from zero. If one believes behavior to be linear, this result indicates Players 2 would choose an unfeasible effort level after receiving a zero transfer (the lowest feasible effort is 0.1).[29] *Transfer* is highly significant and has a positive sign. Players 2 behavior is reciprocal : if the transfer received increases by one they will increase their effort by roughly 0.06. In this respect, our data do not differ from previous studies of the gift exchange game. *Good Mood* is positive and significant. Players 2 unconditionally choose higher levels of effort when in a good mood. *Good Mood* $\times$ *Transfer* is negative and significant. When in a good mood, players 2 respond **40 per cent less** to the transfer they receive if compared to players in a bad mood. While *Female* is not significant, its interaction with $Transfer$ is significant and negative. It indicates women react less than men to transfers.

[28] The Hausman specification test for random effects, is equal to 2.71 which for a $\chi^2(10)$ distribution implies a p-value equal to 0.9874. It confirms that the difference between random and fixed effects estimates is not systematic.

[29] Some caution is appropriate. Even though the lack of significance of *Transfer* ≤ 2 does not point in this direction, a zero constant may stem from some non linearity in behavior at low transfer levels.

Table 7: Regressions with pooled data; N=437, I=65.

	Random Effects			Fixed Effects		
	R^2	χ^2	$p-value$	R^2	F	$p-value$
	0.269	255.27	0.000	0.239	24.33	0.000
	Coefficient	t	p-value	Coefficient	t	p-value
Constant	0.0144	0.292	0.770	0.0687	2.13	0.034
	0.0493			0.0322		
Transfer	0.0588	9.939	0.000	0.0596	9.91	0.000
	0.0059			0.006		
Good Mood	0.0837	1.760	0.078	.	.	.
	0.0483					
Good Mood × Transfer	-0.0219	-4.157	0.000	-0.0231	-4.28	0.000
	0.0053			0.0054		
Female	0.0159	0.330	0.741	.	.	.
	0.0483					
Female × Transfer	-0.0108	-2.048	0.041	-0.0117	-2.161	0.031
	0.0053			0.0054		
Transfer $\leq$ 2	0.0408	1.264	0.206	0.0395	1.203	0.23
	0.0323			0.0328		
Transfer=10	-0.0635	-1.304	0.192	-0.0657	-1.331	0.184
	0.0487			0.0494		
Transfer=11	-0.0845	-0.563	0.573	-0.0678	-0.446	0.656
	0.1501			0.152		
Transfer=12	0.2228	2.42	0.016	0.2178	2.330	0.02
	0.0921			0.0935		
Transfer=13	-0.1412	-1.224	0.221	-0.1239	-1.06	0.29
	0.1153			0.1168		
Transfer=14	-0.489	-3.124	0.002	-0.4816	-3.026	0.003
	0.1565			0.1591		
Transfer=15	-0.421	-2.620	0.009	-0.4337	-2.638	0.009
	0.1607			0.1644		

3.5 Summary of the empirical analysis: moods and morals

The finding of the previous sections highlight significant differences in behavior following our mood induction experiment. Players in a good mood behave differently from players in a bad mood along two moral dimensions: altruism and reciprocity. Altruism is measured by the intercept of the regression presented in Table 7, reciprocity is measure by its slope. They both change when players' mood is changed.

Individuals in a good mood are more altruistic. They give without necessarily having received. This evidence of generosity is in line with a long-standing literature in psychology. There is a respectable body of evidence establishing a positive relationship between good mood and helping behavior (extensive surveys of these results are in Carlson et al. [7] and Isen [27]).

Individuals in a bad mood are more reciprocal. They give more as a function of what they received. This result is novel, and maybe counterintuitive. Based on the previous evidence of a positive relationship between good mood and generosity, many psychologists have posited a positive relationship between good mood and cooperative behavior. On the other hand, others have found a positive relationship between negative affect and cooperation (see Hertel and Fiedler [25], and Hertel et al. [26]). In summary, there is very scant evidence either way, and our experiment provides new insight into this topic.

Another interesting piece of evidence relates selfish behavior and mood. One can say player 2 is selfish if and only if she always maximizes her payoff. This is a particularly strict definition, since it implies player 2 chooses the lowest possible effort level regardless of the transfer received. In our experiment, 9 players turn out to be selfish according to this criterion, corresponding to approximately 14 per cent of the population. What is interesting is the division of these players among the two moods: 7 selfish players are in the good mood treatment (21 per cent of the population), while only 2 selfish players are in the bad mood one (6 per cent of the population). This difference is striking, and a nonparametric test of the hypothesis that the distribution of selfish individuals is the same in the good mood and bad mood populations can weakly reject the null; the Wilcoxon-Mann-Whitney statistic is -1.635 with corresponding p-value equal to

0.102.

We conclude that moral dimensions of behavior can be significantly influenced by emotional aspects which are completely exogenous to the decision task at end.[30]

4 Conclusions

We reported the results of an experiment testing the effect of mood on the behavior of players in a gift-exchange game. In this game, the first mover owns some amount of money and can transfer some of it; the second mover can reciprocate by choosing a costly effort that increases the payoff of the first player. We add to the design a mood induction stage. This focuses on the subjects playing as second movers. The mood induction has two different treatments: one that induces a positive mood, and the other that induces a negative mood. The mood manipulation appears effective on the basis of answers of the subjects to direct questions about their mood.

Previous work shows that the behavior of players in experiment is different from the one predicted by the sub-game perfect equilibrium of the game played among selfish agents. This equilibrium has zero transfer and zero effort. We confirm this result for both moods induced. Transfers and effort are typically positive.

However, the degree of reciprocity changes with the mood. This is measured by how sensitive the second mover's effort is to the first mover's transfer. Subjects in a positive mood exhibit reduced sensitivity: they offered on average a higher effort, but with a lower dependence of the transfer of the first player. On the contrary, people in negative mood were making the effort provided depend steeply of the transfer of the first player.

These results show that the extended preferences, defined not only over own payoffs but also over other players' payoffs, are not stable to changes in mood. This suggests the need for

[30] One interesting and puzzling aspect of our experiment is that although moods and behavior were different, the players' perception of performance (their own and their opponents') is unaffected. In other words, since players' behavior was significantly different in the two treatments one might expect a significant difference in the perception players have of their own and their partner's behavior. After the game, we asked both groups of players to rate their own performance and the performance of their partner only to discover no significant relationship.

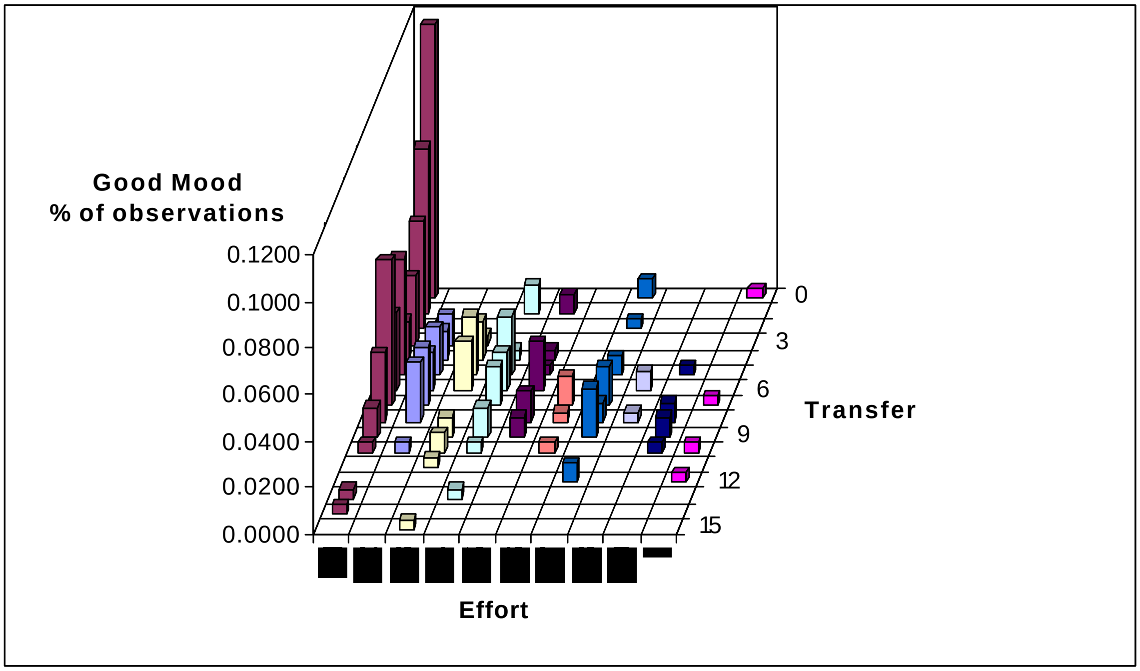
a more general theory, based on the combination of the cognitive role of mood and emotions and evolutionary selection.

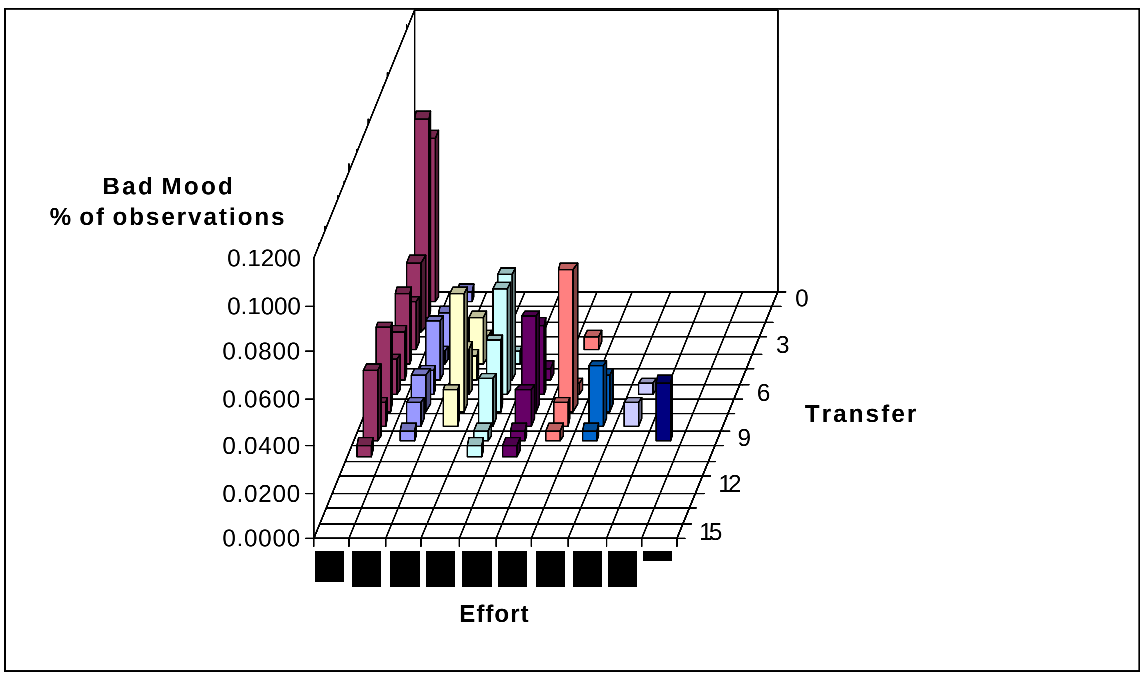
A Appendix

A.1 Data and Complete Regression Results

Table A-1. Number of occurrences of effort and transfer pairs by induced mood.

	Transfer											
	Effort	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Total
Good Mood												
	0	28						2			1	31
	1	17			3	2						22
	2	11						1				12
	3	7	3	1								11
	4	4	3	4	1	1						13
	5	12	5	6	6	1		2		1		33
	6	8	4	5	4	5			2			28
	7	15	6		4		3	4			1	33
	8	7	6			3	1	2	1	2		22
	9	3		2	3	2		5		2		17
	10	1	1	2	1		1			1	1	8
	11			1								1
	12							2			1	3
	13	1			1							2
	14	1										1
	15			1								1
	Total	115	28	22	23	14	5	18	3	6	4	238
Bad Mood												
	0	14	1									15
	1	17	1									18
	2	6	1									7
	3	4	3	1			1					9
	4	6	1	4	1							12
	5	4	5	2	9	1						21
	6	3	2	4	9	6	1		1			26
	7	7	3	10	6	8	12	3				49
	8	2	2	3	4	3	2	5	2			23
	9	6	1		1	1	1	1		5		16
	10	1			1	1						3
	11											
	12											
	13											
	14											
	15											
	Total	70	20	24	31	20	17	9	3	5		199





Comparison between good and bad mood

Table A-2. Tests of effort choices by transfer; H^0 is equal distributions between moods.

	Transfer										
	0	1	2	3	4	5	6	7	8	9	10
z	-0.41	-1.60	0.32	0.97	-0.74	0.98	1.60	2.44	1.62	-0.22	-0.41
p-value	0.684	0.110	0.751	0.331	0.456	0.328	0.108	0.015	0.106	0.826	0.681
N good mood	31	22	12	11	13	33	28	33	22	17	8
N bad mood	15	18	7	9	12	21	26	49	23	16	3

Table A-3. Regressions with pooled data; N=437, I=65, min N_i=5, max N_i=8.

	Random Effects			Fixed Effects		
R^2: within	0.402			0.402		
R^2: between	0.136			0.107		
R^2: overall	0.269			0.239		
	Wald test = 255.27	p-value	0.000	F test = 24.33	p-value	0.000
	Coefficient	t	p-value	Coefficient	t	p-value
Constant	0.0144	0.292	0.770	0.0687	2.13	0.034
	0.0493			0.0322		
Transfer	0.0588	9.939	0.000	0.0596	9.91	0.000
	0.0059			0.006		
Good Mood	0.0837	1.76	0.078			
	0.0483					
Good Mood × Transfer	-0.0219	-4.157	0.000	-0.0231	-4.28	0.000
	0.0053			0.0054		
Female	0.0159	0.33	0.741			
	0.0483					
Female × Transfer	-0.0108	-2.048	0.041	-0.0117	-2.161	0.031
	0.0053			0.0054		
Transfer ≤ 2	0.0408	1.264	0.206	0.0395	1.203	0.23
	0.0323			0.0328		
Transfer=10	-0.0635	-1.304	0.192	-0.0657	-1.331	0.184
	0.0487			0.0494		
Transfer=11	-0.0845	-0.563	0.573	-0.0678	-0.446	0.656
	0.1501			0.152		
Transfer=12	0.2228	2.42	0.016	0.2178	2.33	0.02
	0.0921			0.0935		
Transfer=13	-0.1412	-1.224	0.221	-0.1239	-1.06	0.29
	0.1153			0.1168		
Transfer=14	-0.489	-3.124	0.002	-0.4816	-3.026	0.003
	0.1565			0.1591		
Transfer=15	-0.421	-2.620	0.009	-0.4337	-2.638	0.009
	0.1607			0.1644		

Table A-4. Regressions using good mood data; N=238, I=34, min N_i=5, and max N_i=8.

	Good Mood					
	Random Effects			Fixed Effects		
R^2: within	0.282			0.283		
R^2: between	0.149			0.121		
R^2: overall	0.198			0.186		
	Wald test = 80.85	p-value	0.000	F test = 8.55	p-value	0.000
	Coefficient	t	p-value	Coefficient	t	p-value
Constant	0.1015 0.058	1.749	0.080	0.1198 0.0476	2.517	0.013
Transfer	0.0358 0.0076	4.714	0.000	0.0351 0.0076	4.639	0.000
Female	0.0208 0.0477	0.304	0.761			
Female × Transfer	-0.0095 0.0077	-1.235	0.217	-0.0118 0.0636	-1.511	0.132
Transfer≤2	0.0354 0.0477	0.741	0.459	0.0282 0.0479	0.588	0.557
Transfer=10	-0.0524 0.0637	-0.822	0.411	-0.0625 0.0636	-0.982	0.327
Transfer=11	-0.0803 0.1656	-0.485	0.628	-0.063 0.1652	-0.381	0.703
Transfer=12	0.2283 0.1034	2.207	0.027	0.2254 0.1035	2.178	0.031
Transfer=13	-0.1446 0.1329	-1.089	0.276	-0.1141 0.1327	-0.86	0.391
Transfer=14	-0.4796 0.1742	-2.753	0.006	-0.4736 0.1745	-2.713	0.007
Transfer=15	-0.406 0.1802	-2.253	0.024	-0.4217 0.182	-2.317	0.022

Table A-5. Regressions using bad mood data; N=199, I=31, min N_i=5, and max N_i=8.

	Bad Mood					
	Random Effects			Fixed Effects		
R^2: within	0.533			0.533		
R^2: between	0.124			0.122		
R^2: overall	0.37			0.368		
	Wald test = 190.15	p-value	0.000	46.88	p-value	0.000
	Coefficient	t	p-value	Coefficient	t	p-value
Constant	0.0103 0.0545	0.188	0.851	0.0081 0.0429	0.19	0.85
Transfer	0.0603 0.007	8.561	0	0.0612 0.0071	8.623	0.000
Female	0.0112 0.0439	0.184	0.854			
Female × Transfer	-0.0119 0.0072	-1.644	0.100	-0.0115 0.0835	-1.576	0.117
Transfer≤2	0.0479 0.0439	1.092	0.275	0.0532 0.0442	1.204	0.23
Transfer=10	-0.0881 0.0827	-1.066	0.286	-0.0667 0.0835	-0.798	0.426
Transfer=11	.			.		
Transfer=12	.			.		
Transfer=13	.			.		
Transfer=14	.			.		
Transfer=15	.			.		

A.2 Experiment Materials

Experiment Instructions

You are about to participate in an economic experiment that is part of a research project about decision-making. The instructions are simple, and if you read them carefully and make appropriate decisions, you might earn a considerable amount of money. All earnings resulting from your decisions in the experiment will be added up and paid privately to you in cash at the end of the experiment. The instructions are for private use only. Communication between the participants is strictly forbidden. If you have a question, please raise your hand. Attached to the instructions you will find a questionnaire that you should complete after we have gone through the instructions (and all remaining questions are answered). Together with these instructions you also have got a "documentation" that will be used to document your decisions.

The experiment consists of 8 rounds. At the beginning of each round pairs consisting of two persons each are formed. These two persons are called Person A and Person B. Each of you acts in all 8 rounds either as Person A or as Person B. Whether you are A or B is noted on the card you have drawn. After a round is finished, new pairs with different persons are formed, and the next round begins. You will never be matched twice with the same person, and you will not learn the identity of them.

In each round, Person A is endowed with 15 points. At the beginning of a round, A has to decide how many points she/he wants to transfer to the Person B she/he is matched with. This transfer t can be any integer between 0 and 15. Hence, transfers like 12 or 3 are allowed, but not transfers like 5.4 or 9.6. The points not transferred to B (i.e. $15 - t$) remain with A. When A has made a decision about the transfer, she/he has to record this transfer on her/his documentation in the line "transfer". It will then be transmitted to "her/his" Person B by the experimenter by recording it in B's documentation in the line "transfer".

After B is informed about the transfer, she/he has to decide about a conversion rate r. r can be 0.1, 0.2, 0.3, .1. (see the list of feasible values of r on page 2 of these instructions). When B has made a decision about the conversion rate, she/he has to record it in her/his documentation in the line "conversion rate". It will then be transmitted to Person A by the experimenter by recording it in A's documentation in the line "conversion rate". This finishes the round, and the next round with new partners start. Note, though, that your role (A or B) remains fixed.

The conversion rate r chosen by B is the rate that exchanges the points remaining with A into Dutch Guilders. Hence, A's earnings in a round in Dutch Guilders are given by:

$$\text{earnings of } A = (15 - \text{ transfer } t)(\text{ conversion rate } r)$$

B earns the points transferred to her/him. But the of the conversion rate is connected with costs $c(r)$, which depend the conversion rate B chooses. As you can see from the list of possible conversion rates r and conversion rate costs $c(r)$, these costs are increasing in r. Hence, B's earnings in a round in Dutch Guilders are given by:

$$\text{earnings of } B = \text{ transfer } t - \text{ conversion rate cost } c(r)$$

Do you have any questions?

Conversion rate costs:

e	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
$c(e)$	0.0	0.2	0.4	0.8	1.2	1.6	2.0	2.4	3.0	3.6

Questionnaire

We would like to test whether you have understood our instructions. Therefore we ask you to answer the following questions. Please try to answer each question. Wrong answers have no consequences for you.

1) Assume that A chooses a transfer of 4, and B a conversion rate of 0.9. How much do they earn?
Earnings of A......
Earnings of B......
(*Three more questions like the previous one followed at this point.*)

The Movies

In the bad mood treatment, the following sequence of approximately 6 minutes from Universal Pictures' Schindler's List, directed by Steven Spielberg, is shown .

> **Liquidation of the Ghetto, March 13, 1943.** The scene begins with trucks full of soldiers ready to move into the Ghett. Then the Nazi stormtroopers, many of whom have leashes on muzzled dogs, set up for the extermination. Noises of the growling dogs, trucks, and orders shouted out are heard. The stormtroopers surround the buildings and expel the Jews from their apartments. Fear appears on the faces of the children. In one of many vignettes, some of the refugees roll their valuable jewels into wads of bread to be swallowed. Any resistance or questioning is halted with a gun. Suitcases are dumped from upper balconies and abandoned as litter. A young male character tells her fiance that he is planning to escape through the sewer tunnel, but she refuses to join him. He opens a manhole cover and descends into the steamy depths. Frightened Jews are yelled at and herded into groups. One father is killed with machine-gun fire for deflecting a soldier's aim toward his son's back as he was attempting to run away. The boy is also arbitrarily shot as he is dragged back. To prevent even crueler deaths, a doctor in the hospital calmly measures out doses of poison that are soon administered by nurses to patients. The lifeless corpses are machine-gunned until the soldiers realize they're already dead. Without regard to family considerations, women are segregated from the men, splitting husbands and wives.

In the good mood treatment, the following sequence of approximately 6 minutes is shown from Charles Chaplin Productions' City Lights, directed by Charles Chaplin.

> **Boxing Fight.** The boxing fight sequence is a funny choreographed ballet between the Tramp (Chaplin) his opponent (a mean looking boxer) and their referee (a tall wide man). The Tramp defensively dances around in the ring to avoid the punches of the big opponent, deftly hiding and ducking for safety behind the tall referee, and slipping away from his opponent at one point to leave his opponent facing the referee. Later in the fight, the bell rope gets wrapped around the Tramp's neck. When he is knocked down, the rope pulls on the bell and luckily, the round is declared over. But unfortunately, when he turns to go to his corner for a rest, the Tramp's movement rings the bell again, starting the next round.

Questionnaires

Questions before the game was played.
Answer by circling the appropriate number.

1. Rate the artistic content of the scene you just saw on the following scale:

1: extremely high / very good
2
3
4
5
6
7
8: extremely low / very bad

2. Rate the actors' performance in the scene you just saw on the following scale:

1: extremely good / very able
...
8: extremely bad / very unable

3. Rate how do you feel on the following scale:

1: extremely happy / in a very good mood
...
8: extremely unhappy / in a very bad mood

4. Rate a price of 5dfl to watch the entire movie on the following scale:

1: extremely cheap / a very good bargain
...
8: extremely expensive / a very bad bargain

Questions after the game was played.
Answer by circling the appropriate number.

1. Rate your performance in the economic experiment on the following scale:

1: extremely satisfactory / very good
...
8: extremely unsatisfactory / very bad

2. Rate how do you feel now on the following scale:

1: extremely happy / in a very good mood
...
8: extremely unhappy / in a very bad mood

3. Rate how happy you feel about your partners' decisions in the experiment on the following scale:

1: very happy / extremely satisfied
...
8: very unhappy / extremely unsatisfied

4. Have you ever participated in an economic experiment before:

References

[1] Andreoni, James (1990): "Impure Altruism and Donations to Public Goods: A Theory of Warm Glow Giving", Economic Journal 100, 464-477.

[2] Becker, Gary S. (1976): *The Economic Approach to Human Behavior*, Chicago University Press, Chicago, Ill.

[3] Berg, Joyce, Dickhaut, John and McCabe, Kevin (1995): "Trust, Reciprocity and Social History", *Games and Economic Behavior*, 10, 122-142.

[4] Bewley, Truman F., (2000): *Why Wages Don't Fall During a Recession*, Harvard University Press, Cambridge, MA.

[5] Bolton, Gary E., and Ockenfels, Axel (2000): "ERC: A Theory of Equity, Reciprocity and Competition", *American Economic Review* 90, 166-193.

[6] Bosman, Ronald, and Winden, Frans van, (1999): "The Behavioral Impact of Emotions in a Power to Take Game", Discussion paper Tinbergen Institute (TI 99-039/1).

[7] Carlson, Michael, Charlin, Ventura and Miller, Norman, (1988): "Positive Mood and Helping Behavior: A Test of Six Hypotheses", *Journal of Personality and Social Psychology*, 55, 211-229.

[8] City Lights. Director: Charlie Chaplin. Videocassette. Charles Chaplin Productions 1931.

[9] Charness, Gary (2000): "Attribution and Reciprocity in a Simulated Labor Market: an Experimental Investigation", *Games and Economic Behavior*, forthcoming.

[10] Charness, Gary and Grosskopf, Brit (2000): "Relative Payoffs and Happiness: an Experimental Study", *Journal of Economic Behavior and Organization*, forthcoming.

[11] Charness, Gary, and Haruvy, Ernan (1999): "Altruism, Equity, and Reciprocity in a Gift-Exchange Experiment: an Encompassing Approach", mimeo.

[12] Charness, Gary and Rabin, Matthew (2000): "Social Preferences: Some Simple Tests and a New Model", mimeo.

[13] Dufwenberg, Martin, and Kirchsteiger, Georg (1998): "A Theory of Sequential Reciprocity", CentER Discussion paper No. 9837, Tilburg University

[14] Falk, Armin, and Fischbacher, Urs, (1999): "A Theory of Reciprocity", mimeo.

[15] Fehr, Ernst, and Gächter Simon (1998): "Reciprocity and Economics. The Economic Implications of Homo Reciprocans", *European Economic Review* 42(3-5), 845-859.

[16] Fehr, Ernst, and Gächter Simon (2000): "Fairness and Retaliation: The Economics of Reciprocity", *Journal of Economic Perspectives*, 14(3), 159-181.

[17] Fehr, Ernst, Kirchsteiger, Georg, and Riedl, Arno (1993): "Does Fairness Prevent Market Clearing? An Experimental Investigation", *Quarterly Journal of Economics* 108(2), 437-460.

[18] Fehr, Ernst, Kirchsteiger, Georg and Riedl, Arno (1998): "Gift Exchange and Reciprocity in Competitive Experimental Markets", *European Economic Review* 42(1), 1-34.

[19] Fehr, Ernst, and Schmidt, Klaus (1999): "A Theory of Fairness, Competition, and Cooperation", *Quarterly Journal of Economics*, 114, 817-868.

[20] Fehr, Ernst, and Schmidt, Klaus (2000): "Fairness, incentives, and contractual choices" *European Economic Review*, 44(4-6),1057-1068.

[21] Forgas, Joseph P., (1995): "Mood and Judgement: the Affect Infusion Model", *Psychological Bulletin*, 117(1), 39-66.

[22] Geanakoplos, John G., Pearce, David, and Stacchetti, Ennio, (1989): "Psychological Games and Sequential Rationality", *Games and Economic Behavior*, 1, 60-79.

[23] Gilbert, Daniel, Fiske, Susan T., and Lindzey, Gardner (1998): *The Handbook of Social Psychology* 4th Edition, Oxford University Press and McGraw-Hill, New York and Oxford.

[24] Hermalin, Benjamin E., and Isen, Alice M. (2000): "The Effect of Affect on Economic and Strategic Decision Making", mimeo.

[25] Hertel, Guido, and Fiedler, Klaus (1994): "Affective and Cognitive Influences in a Social Dilemma Game", *European Journal of Social Psychology*, 24, 131-145.

[26] Hertel, Guido, Neuhof, Jochen, Theuer, Thomas, and Kerr, Norbert (2000): "Mood Effects on Cooperation in Small Groups: Does Positive Mood Simply Lead to More Cooperation?", *Cognition and Emotion*, 14(4), 441-472.

[27] Isen, A. M., (2000), "Positive Affect and Decision Making", in *Handbook of Emotions*, cited.

[28] Lewis M. and Haviland-Jones, J.M, (2000), *Handbook of Emotions*, 2nd Edition, The Gulford Press, New York and London.

[29] Morris, W. N., (1989): *Mood. The Frame of Mind*, New York, NY, Springer Verlag.

[30] Nowlis, V., (1965), "Research with the mood adjective checklist", in S. S. Tomkins and C. E. Izard, *Affect, Cognition and Personality*, New York, NY, Springer.

[31] Palomino, F., Rigotti, L. and Rustichini, A., (1999), "Skill, Strategy and Passion: an Empirical Analysis of Soccer", CentER Discussion Paper.

[32] Rabin, Matthew (1993): "Incorporating Fairness into Game Theory and Economics," *American Economic Review*, (83), 1281-1302,

[33] Schindler's List. Director: Steven Spielberg. Videocassette. Universal Pictures, 1993.

[34] Stigler, George J., and Becker, Gary S. (1977): "De Gustibus Non Est Disputandum", *American Economic Review*, 67(2), 76-90.

[35] Zajonc, Robert B., (1998): "Emotions", in *The Handbook of Social Psychology*, cited, Chapter 13, 591-632.