

SOCIAL NORMS AND BELIEFS: AN EXPERIMENTAL INVESTIGATION

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Introduction. In the field of experimental economics one of the most studied topic is subjects' reaction when a cooperation norm or a redistribution norm is violated. This implies that the experimental literature concerning norms mainly corresponds to studies on fairness and, consequently, on punishment of defectors (f.i., Fehr and Gächter, 2000, for second-party punishment; Fehr and Fischbacher, 2004, for third-party punishment). A further implication of these mainstream experimental designs is that updating the classical figure of the *Homo Oeconomicus* by introducing social preferences (inequity aversion, reciprocity, altruism, spitefulness) into the economic theories is sufficient to explain the experimental results.

At the same time, models like Grimalda and Sacconi (2005), Sacconi and Grimalda (2007) and Bicchieri (2006) deal with the problem of the compliance with social norms, whose role is crucial when formal sanctions cannot be used and the reputational mechanism cannot be fully implemented as enforcement device. In both models the willingness to conform to shared social norms - which imply non-self-interested behaviour - depends on expectations about what people do (First Order Empirical Expectations – FOEE, and Second Order Empirical Expectations - SOEE) and/or what people expect ought to be done (Second Order Normative Expectations - SONE). In particular, according to Bicchieri's theory of social norms, in presence of a conflict of interests among agents conformity is conditional on both NE and EE.¹ In Sacconi and

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Grimalda's model compliance is the consequence of both of agents' participation in choosing the norm in a social contract setting and of the existence of expectations about others' willingness to conform (FOEE and SOEE).

The main contribution of this paper is twofold. First of all, it focuses on the decisional process that leads to the creation of a social norm. Secondly, it analyses the mechanisms through which subjects conform their behaviour to the norm. In particular, our aim is to study the role and the nature of Normative and Empirical Expectations and their influence on people's decisions.

Experimental Design. The tool is the *Exclusion Game* (Sacconi and Faillo, 2005; Faillo and Sacconi, 2007), a sort of 'triple mini-dictator game'. It represents a situation where 3 subjects – players A - have to decide how to allocate a sum S among themselves and a fourth subject - player B - who has no decisional power. In particular, each player A has to decide the amount s/he wants to ask for her/himself choosing one of three possible strategies: asking 25%, 30% or 33% of S. The payoff of players A is exactly the sum asked for themselves (a1, a2 and a3 respectively), while the payoff of player B is the remaining sum ($S - a1 - a2 - a3$). In our experiment, each group of four players has 60 tokens to allocate – each token corresponds to 50 eurocents.

The experiment consists of three treatments: the *Baseline Treatment (BT)*, the *Agreement Treatment (AT)* and the *Outsider Treatment (OT)*.

In the *BT* participants are randomly distributed in groups of four players and play the *Exclusion Game*.

In the *AT* participants are randomly distributed in groups of four players and are instructed about the stages of the experiment and about the *Exclusion Game*. In the first stage, before knowing their role in the game they are

¹ We have Empirical Expectations (EE) when a subject believes that a sufficiently large subset of the population conforms to the norm. We have Normative Expectations (NE) when a subject believes that a sufficiently large subset of the population expects him/her to have to conform to the norm.

involved in a voting procedure. In particular, in each group participants are invited to vote for a specific allocation rule². Players have the possibility to bargain - through the computer - to reach a unanimous agreement on the rule within a limited numbers of trials (10 in our experiment). The agreement is not binding, but failure in reaching it is costly, since only groups who reach an agreement in this first stage have the chance to participate to the second stage. In the second stage the composition of the groups is unchanged and roles are randomly assigned to implement the *Exclusion Game*. In this case, players A can decide either to implement the voted rule or to choose one of the alternative allocations. Players who do not enter the second stage wait for the end of the session. Their payoff is the show-up fee.

In the *OT* participants are randomly distributed in groups of four players and are instructed about the stages of the experiment and about the *Exclusion Game*. The first stage as well as the rule to enter the second stage are the same as in the *AT*. At the beginning of the second stage, players are informed about their role and groups are rematched. In particular, a player A for each group (the outsider) is reassigned to a different group and instructed about the rule chosen by the new group. After the rematching subjects participate in the *Exclusion Game*. Also in this case players who do not enter the second stage wait for the end of the session and they are paid only the show-up fee.

For a summary see Table 1.

Experimental Procedure. The experiment was run both in Milan (EELAB – University of Milan Bicocca) and in Trento. Recruitment was done by email advertisement. We ran 3 sessions for the *BT* (1 in Milan and 2 in Trento), 4 sessions for the *AT* (2 in Milan and 2 in Trento), 5 sessions for the *OT* (3 in Milan and 2 in Trento). Overall, 216 undergraduate students – 104 in Milan and 112 in Trento – participated to the experiment. A more detailed description of the sessions is in Table 1.

² Subjects must vote one out of three alternative division rules (the forth number is player B's payoff): {15,15, 15,15},{18,18, 18,6}, {20,20, 20,0}. The first rule assigns the same payoff to every member of the group; the second rule corresponds to a partial inclusion of player B in sharing the wealth; the third rule implies the total exclusion of player B.

The experiment was programmed and conducted with the software z-Tree (Fischbacher, 2007). The instructions were read by participants on their computer screen while an experimenter read them loudly.

After reading the instructions and before subjects were invited to take decisions, some control questions were asked in order to be sure that players understood the rules of the game. At the end of each session, subjects were asked to fill in a brief survey to check for socio – demographic data.

Players were given a show – up fee of 3 euro.

Beliefs elicitation. In all the treatments, at the end of the game and before players are informed about the decisions taken during the *Exclusion Game* by the other coplayers, first order and second order expectations (both normative and empirical) are elicited through a brief questionnaire. In particular, in each group each player makes a statement: 1. of the probabilities related to each possible choice of coplayers A (First Order Empirical Expectations); 2. of the probability related to each coplayers' possible judgement about his/her own choice (Second Order Empirical Expectations); 3. of the choice should have been taken by a representative player A (First Order Normative Expectations) ; 4. of the choice that coplayers consider as the 'right' one (Second Order Normative Expectations).

Both in the *AT* and in the *OT* only players who enter the second stage are interviewed about their expectations. Moreover, in the *OT* guesses on behaviour and beliefs of partners and outsiders are asked separately.

Only good guesses of the Empirical Expectations are rewarded through the well-known quadratic scoring rule.

Results.

Result 1. Subjects' choices are in line with their expectations.

If we check whether there is any correlation between beliefs and decisions, it turns out that most players' choices are in line with either empirical or normative expectations (Table 2).³

However - as in Bicchieri and Xiao (2007) - when normative and empirical expectations are in contrast, the latter play a more relevant role in players' decisional process (Table 3) and they are significantly correlated to subjects' choices (Spearman test; $p < 0.03$).

Result 2. When agreement is possible, it is reached by all groups.

See Table 4 for a detailed description of agreements.

Result 3. Agreement induces convergence of empirical expectations.

In the BT at least 70% of the players choose 20. In the AT 17 groups out of 18 choose the 15-15-15-15 rule and 1 the 18-18-18-6 one. If we analyse people's expectations, it turns out that in the AT there is a significant decrease of subjects who think that the other members of their group have asked 20 tokens (Table 5). A probit regression shows that the probability of expecting the others have chosen 20 is significantly lower in the AT ($p = 0.000$). Consequently, also choices are significantly lower in the AT (Mann-Whitney; $p = 0.0002$).

Result 4. Expectation of conformity is higher in the partner protocol.

If we analyse the difference between players' empirical expectations about other players' choice and the amount to be chosen according to the voted rule, it turns out that it is significantly lower in the AT (OLS; $p = 0.054$). This means that in the OT subjects expect a higher deviation from the chosen rule. Since expectations and choices are correlated, this explains why a lower percentage of players comply to the norm in the OT (Table 6).

³ We consider only first order expectations since second order expectations are either equal or highly correlated to the former.

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Table 1. Experimental Design

Treatment	Voting Procedure	Matching	Sessions	Subjects
BT	NO	Partner Protocol	2 in Trento (T) 1 in Milan (M)	36 (T) + 20 (M) 9 groups (T) + 5 groups (M) (27 (T) + 15 (M) players A)
AT	YES	Partner Protocol	2 in Trento (T) 2 in Milan (M)	36 (T) + 36 (M) 9 groups (T) + 9 groups (M) (27 (T) + 27 (M) players A)
OT	YES	Mixed – Partner and Stranger Protocol	2 in Trento (T) 3 in Milan (M)	32 (T) + 56 (M) 8 groups (T) + 14 groups (M) (24 (T) + 42 (M) players A)

Table 2. Beliefs and choices

	It is possible to explain subjects' behaviour through...		
	FOEE	FONE	OTHER
BT			
T (N = 27)	82%	7%	11%
M (N = 15)	93%	0%	7%
AT			
T (N = 27)	82%	11%	7%
M (N = 27)	82%	7%	11%
OT			
T (N = 24)	71%	21%	8%
M (N = 42)	83%	10%	7%

Table 3. Normative and empirical expectations

When FOEE and FONE are different it is possible to explain subjects' behaviour through...			
	FOEE	FONE	OTHER
BT T (N = 14) M (N = 8)	72% 100%	14% 0%	14% 0%
AT T (N = 11) M (N = 9)	64% 78%	27% 22%	9% 0%
OT T (N = 14) M (N = 21)	57% 71%	14% 19%	29% 10%

Table 4. Group's Choices by University x Treatment.

		Rule					
		15 – 15 – 15 – 15		18 – 18 – 18 – 6		20 – 20 – 20 – 0	
Trento	AT	88.9%	8/9	11.1%	1/9	0.0%	0/9
	OT	87.5%	7/8	12.5%	1/8	0.0%	0/8
Milano	AT	100.0%	9/9	0.0%	0/9	0.0%	0/9
	OT	92.9%	13/14	0.0%	0/14	7.1%	1/14

Table 5. Distribution of FOEE by University x Treatment

		15 - 18	20
Trento	BT (N = 27)	15.0%	85.0%
	AT (N = 27)	20.0%	80.0%
Milano	BT (N = 15)	52.0%	48.0%
	AT (N = 27)	69.0%	31.0%

Table 6. Compliance by University x Treatment.

Trento	AT	44.4%	12/27 10 rule 15 - 2 rule 18
	OT	29.2%	7/24
	<i>OT</i> (Insiders)	37.5%	6/16 5 rule 15 - 1 rule 18
	<i>OT</i> (Outsiders)	12.5%	1/8 1 rule 15
Milano	AT	55.5%	15/27 15 rule 15
	OT	45.2%	19/42
	<i>OT</i> (Insiders)	39.3%	11/28 9 rule 15 - 2 rule 20
	<i>OT</i> (Outsiders)	57.1%	8/14 7 rule 15 - 1 rule 20