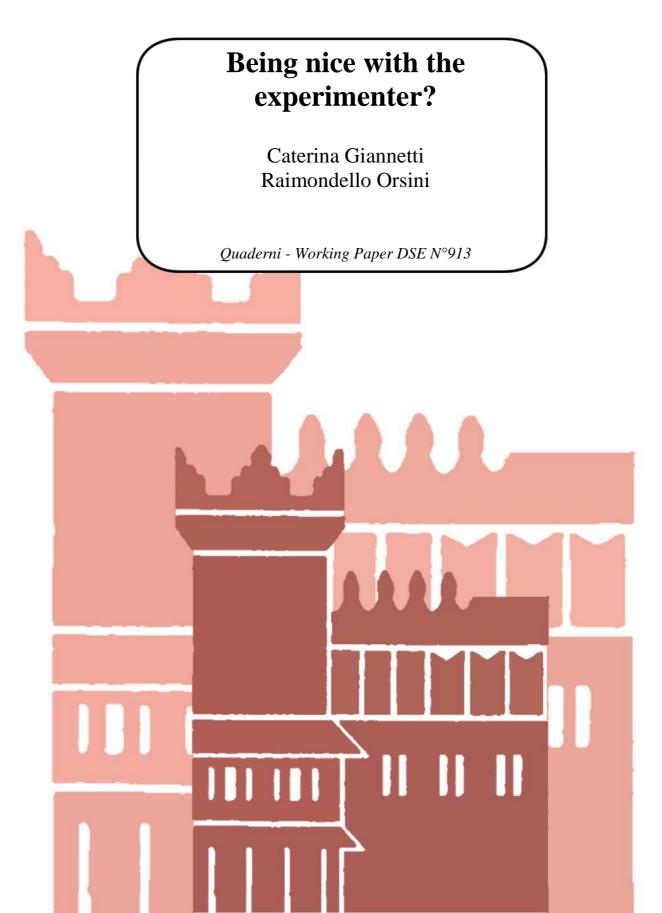Alma Mater Studiorum - Università di Bologna
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Being nice with the experimenter?

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Abstract

This paper investigates the determinants of reciprocity towards the experimenters in the lab under a flat-wage scheme. We find that personality attributes – such as agreeableness – help predict the behaviour of the subjects. We additionally propose and assess a general measure of reciprocity.

Keywords: flat-wage, reciprocity, agreeableness

JEL Classification: C91; J33

1 Introduction

Experimental subjects are often paid a flat-wage to perform a task in the lab (e.g. Charness et al. [2013], Dohmen and Falk [2011]). A standard objection to this setting is that effort choices may simply derive from the fact that participants feel committed to perform the task in order to please the experimenter perceived as an 'authority' (Zizzo [2010]) or to avoid boredom. In relation to the former bias, Zizzo [2010] discusses solutions to minimize the risk of experimenter demand effects. Concerning to the latter, Charness et al. [2013], for example, provide subjects with alternative leisure activities during the experiment and choose a task that is sufficiently tedious to induce disutility. In addition, they clearly state in the instructions of the experiment that subjects are allowed to read magazines and own materials at any time.

However, even if they dislike to perform the task and do not perceive the experimenter as an authority, lab participants can still choose to perform the task in order to be nice and reciprocate the experimenter paying the wage. Although this kind of behaviour is potentially orthogonal to the experiment objectives (and therefore thus not impinge the experimental results), it might be worthy controlling for that.

Thus, one important open question concerns the determinants of individual differences to reciprocate. Previous research has shown that personality traits are good predictors of individuals' behaviour, in the laboratory and in the field, as much as do economic preferences (Rustichini et al. [2012]).[1] Ben-Ner et al. [2004] find that *direct reciprocity* (i.e. towards a subject who favorably acts towards us) appears to be affected only by personality traits, whereas *indirect reciprocity* (i.e. towards a subject who is different from the one who favorably acts towards us) appears to be affected by certain socialization variables. Ashton et al. [1998] find that personality traits involving forgiveness and non-retaliation, which are highly correlated with agreeableness and low level of neuroticism, are important determinants of reciprocal altruism directed toward non-kins (people who are not genetic relative). In a field experiment, Englmaier and Leider [2012] show that positive response to a wage-increase primarily comes from highly agreeable workers, while workers who scored very low on such a trait tend to react negatively.

Another related question is whether the use of a general question on (*direct*) reciprocity (as the one available in surveys which measures general risk aversion, see Dohmen et al. [2011]) is a good method for measuring reciprocity attitudes. The idea is to ask subjects "*If someone does something that is beneficial*

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[1]The most widely accepted taxonomy of personality traits is the Big-Five taxonomy, which comprises five factors: Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism (also called emotional stability). See Borghans et al. [2008] for a complete discussion.

for you, would you be prepared to return a favour even if this was not agreed upon in advance and may be costly for you"? and to check whether it correlates with a more objective measure of reciprocity as derived from our experimental analysis.

In relation to the first question, and in line with other research, our analysis seems to suggest that personality traits explain a great part of individual inclination to reciprocate. In particular, highly agreeable and open individuals are more prone to reciprocate. In addition, since we are able to rule out other possible drivers, such as religion, ability, or social development - and reciprocity seems to be affected mainly by personality traits, our results are suggestive of an innate disposition to reciprocate. In fact, as long as personality traits are stable over the lifetime (Borghans et al. [2008]), life experiences can only partly affect individual propensity to reciprocate. Moreover, our results also suggest that a general question on the individual's attitude to reciprocate is not enough to capture such kind of behaviour, being instead more supportive of the short version of the Big Five personality test. Even in its short form, this questionnaire represents a useful tool to be used in the analysis of individual behaviour in the lab.

2   Data and description of the experiment

The data we use in this paper are a byproduct of an experiment that was run between April and May 2013 at the LES Laboratory of University of Bologna in Forlì Campus using z-Tree software (Fischbacher [2007]). As we were concerned about the use of a flat-wage in our experiment, we decided upfront to collect additional information through a series of questionnaires and to derive from our data a measure of reciprocity. Therefore, we are not going to exploit the variation in our treatments to causally identify the determinants of reciprocity.[2] We rather want to provide evidence on the strong statistical association between the positive effort in the laboratory and personality traits to account for possible confounders of experimental results. We thus broadly discuss herein the experimental features which are related to the current research question.

We conducted our experiment to study the effect of mortality salience on individuals' effort to gain self-esteem and status. A total of 126 students participated in the experiment. In the treatment sessions, (i.e. with mortality salience) subjects are reminded of their own death before conducting a real-effort task.[3] In the control sessions (i.e. without mortality salience), subjects were asked to write an essay

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[2]In this case, similarly to Englmaier and Leider [2012], we would have needed to vary the fixed wage across treatments.

[3]The standard procedure to prime subjects consists in two questions to be answered briefly that ask participants to describe the emotions that the thought of their own death arouses in them and what would happen to them as they physically die. The exact questions to be answered are:

on a control topic (i.e. music). Participants then filled out a short version of the Big Five personality questionnaire.

In all treatments, subjects performed a real-effort task, which was not very difficult and quite boring - they were asked to compute summations of three-digits numbers - and were paid with a fixed amount of money (one euro per period) disregarding individual's performance (measured by the number of correct answers). At the end of this real-effort task, we provided the subjects with a ranking of the results in their group. Each period lasted 120 seconds, and we repeated this exercise for seven periods. If subjects maximize their own payoff, the economic theoretical prediction is that the minimum effort should be exerted. But if individuals have intrisic motivation to perform (such as self-esteem and status-seeking), an effort above the minimum should be observed. Previous experiments confirm that individuals do care about their status (see, for example, Kosfeld and Neckermann [2011]) and exert an effort above the minimum.

The main concern of this design, however, is that subjects may also decide to perform the task in order to be "nice" (in a sort of "gift-exchange" game) with the experimenter, somehow by feeling an obligation to perform the task once in the lab. To be sure that this was not the case, subjects were told (as highlighted on the screen and reported in the instructions) they could stop performing the task at any time during the experiment without any cost. To allow for alternative activities, as Charness et al. [2013], we provided subjects with some magazines and we also allowed them to read their own materials.

The observation that several individuals chose in the experiment to exert no effort reduces this concern.[4] Relying on the same observation, however, we can derive an indicator of the absence of reciprocity towards the experimenter (i.e. *Reciprocity Absence*) to study the drivers – if any – of the behaviour of participants who decided *to not* actively participate in the experiment. We thus measure how many times a subject did nothing – or very close to nothing (i.e. enter a small number of summations) – during the experiment. More specifically, we measure the number of times a subject entered less than five summations during the experiment, which roughly corresponds to the lowest 5% of the distribution of summations across treatments.[5] We decided to rely on 5 summations as it allows for more variability in the intensity

- "Please describe as specifically as you can the emotions that the thought of your own death arouses in you"
- "Please describe as specifically as you can what do you think will happen to you as you physically die".

[4]Indeed in most gift-exchange experiments there is a minority of subjects who continously provide the minimal effort, regardless of the wage rate (Cooper and Kagel [2009]).

[5]We also checked for other thresholds (such as 4,3,...,0). Our results do not change. We could have also collapsed all positive observations (i.e. Reciprocity Absence > 0) and treat this as a probit (or logit) estimation problem, but doing so will discard information on the behaviour of subjects for the entire experiment with no additional benefits (as no difference emerged).

Table 1: INDICATOR OF ABSENCE OF RECIPROCITY
This indicator (Reciprocity Absence) measures how many times (i.e. periods) a subject entered less than five summations during the experiment.

# Times	Frequency	Percentage
0	107	84.92
1	9	7.14
2	4	3.17
3	1	0.79
4	2	1.59
5	1	0.79
6	1	0.79
7	1	0.79
	126	

of no-reciprocal behaviour (see Table (1)). From this table we notice that about 15% of our participants did not actively participate in the experiment by entering less than 5 summations in at least one period.

Our measure of reciprocity is thus a weak measure of reciprocity because only one part (and not both) can respond to a small "kind action" with a nice behaviour (Charness and Kuhn [2011]). In this perspective, a sense of "obligation" to behave nicely performing the task may emerge among participants as a result of receving a fair wage. We cannot instead talk about a sense of "guilt" as participants did not make in advance any promise to provide a positive effort once in the lab.

One may, however, object that this is a sort of *ad-hoc* measure. But if our indicator is a reliable measure of the absence of reciprocity, we should not observe any statistical difference between the various treatments. Tests on the equality of means (i.e. TTEST) and distributions (MANN-WITHNEY) indeed confirm that there are no significant differences between treatments. Importantly, our indicator is also negatively correlated with the general measure of reciprocity we obtained from the exit questionnaire. Although behavioural traits may also affect the overall level of effort exerted in the experiment, we leave to our companion paper the aim to study the drivers of the overall number of entries. In the following, we just want to focus on the behaviour of those subjects who did not play during the experiment.

3   Results

Table (2) reports the average of marginal effects for the Tobit model – with censoring point at zero – estimating individuals' attitude to reciprocate in the lab. The dependent variable is Reciprocity Absence. In column *a* we start by adding the personality traits which turned out to be significant in previous research, namely *Agreeableness, Neurocitism* and *Openness*. Consistent with Ben-Ner et al. [2004] we find that indi-

viduals who score higher on agreeableness and openness are more willing to reciprocate by exerting a positive level of effort. In column *b,* we additionally include *Conscientiousness* and *Extraversion*. Again in line with Ben-Ner et al. [2004], these traits turned out to be not significant and their inclusion do not alter the results. Differently from them, however, we decide to keep these traits for the entire analysis.[6] In column *c* we include our general indicator of reciprocity. More specifically, *General Reciprocity* is a categorical variable measuring the level of subject reciprocity on a five-point Likert scale (i.e. "*If someone does something that is beneficial for you, would you be prepared to return a favour even if this was not agreed upon in advance and may be costly for you*"?). This measure is not significant and does not change our conclusions (the size of the coefficients is still the same, although agreeableness is now only jointly significant with openness). At first, this result suggests that this indicator is not able to fully capture individual attitude to reciprocate. In column *d* we include participants' age and sex.[7] The inclusion of these participants' characteristics do not change the size of our coefficients (although agreeableness loses significance). In column *e* we include a measure of general risk aversion as in Dohmen et al. [2011].[8] Interestingly this variable is positive and significant, suggesting that individuals who are more risk averse are more likely to be less reciprocal, while agreeableness is again significant at 5% level. Finally in column *f* we add a pyschologists' measure of individuals' tendency to answer to questionnaires in a "socially desirable" way, that is a proxy for individuals' attitude to give answers that make them look "good" (Zizzo [2010]).[9] Even the inclusion of this variable does not change our results.

One of the main criticism of the five-factor model is that it does not fully account for the motivation of the subjects (see Borghans et al. [2008]). In our exit questionnaire, we were able to collect a measure of individuals' motivation to perform well in the task. Even though this variable is likely to be affected by our priming strategy, we decided to include it in column *g*.[10] Indeed this variable is highly significant and negatively correlated with Reciprocity Absence. Interestingly, however, the variable measuring individual agreeableness is still negative and significant suggesting that more agreeable individuals tend to exert a positive effort in the experiment with a flat wage. It is also interesting to note that conscientiousness is only significant at 10% level in this final regression. This statistical result is consistent with the observation that motivation is partly measured by conscientiousness (i.e. achievement striving).

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[6]In several specifications, these traits turned out to be individually and jointly not significant.

[7]From column d on, the number of observations reduces to 120 because in the pilot (made with only 6 subjects) we did not include the general question on reciprocity.

[8]The question is: "How willing are you to take risks, in general?".

[9]We only rely on two questions to derive this indicator as our questionnaires were already quite long.

[10]Since subjects answered two similar questions on motivation, we construct an indicator out of these two questions relying on principal factor analysis.

In unreported regressions (available upon request) we check the robustness of our results to several other individual characteristics, which might affect our results and were also collected in the exit questionnaire. For example, like Ashton et al. [1998], our results are also robust with respect to other environmental factors - such as religion - which can clearly influence the propensity to reciprocate. We therefore include an indicator of the importance of religion (similar to the one in the World Value Survey) in subjects' life: our results suggest that religion is not playing a decisive role. Another criticism is that individual ability in summations may drive the results. We therefore additionally control for individual past ability in math, and results do not change.[11] We also control for individuals' materialism, personal development and social development as they proved to be relevant determinants in mortality research (see Rindfleisch et al. [2009]). Neither of these variables turns out to significantly affect our results. Finally, we check the robustness of the results to the Tobit specification by estimating Poisson and Probit/Ordinal logit regressions. Our conclusions do not change.

4 Conclusion

Individual decisions to exert effort in the lab under a flat-wage might be influenced by boredom as well as by the experimenter demand effect. Once these two factors are ruled out, individual propensity to be nice with the experimenters can also play a role. Our analysis indicates that individual agreeableness and openness might play a decisive role in the individual decision to exert effort. To account for that, our results also suggest to rely on a short version of the Big-Five questionnaire instead of a general question on the individual attitude to reciprocate.

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[11]Individual math ability has been measured by asking subjects to rate – from one (i.e. definetly no) to five (i.e. definitely yes) – their agreement with the following statement: *"In the past I have proved to have good mathematical skills"*.

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Table 2: Tobit Estimation Results: Average Of Marginal effects

The dependent variable is *No Reciprocity*, which measures the number of summations (up to five) entered by participants in the experiment that was paid according to a flat rate. *Agreeableness, Neurocitism, Openness, Extraversion* and *Conscientiousness* are variables measuring the Big Five Factors. *General Reciprocity* is a categorical variable which measures individual general reciprocity on a five-item Likert scale. *Female* is a dummy variable equal to 1 for female participants, whereas *Age* is a discrete variable measuring participants' age. *Risk* is the general measure of risk aversion. *Lie* is a variable measuring subjects' tendency to respond to questionnaires in a "socially desirable" way. *Motivation* is a variable measuring individual motivation to perform well in the experiment.

	a	b	c	d	e	f	g
Agreeableness	-0.388**	-0.306*	-0.322	-0.323	-0.377**	-0.454**	-0.223*
	(0.174)	(0.182)	(0.203)	(0.208)	(0.171)	(0.231)	(0.134)
Neuroticism	-0.004	0.017	0.010	0.014	0.020	-0.037	-0.028
	(0.135)	(0.130)	(0.115)	(0.153)	(0.142)	(0.190)	(0.174)
Openness	-0.488**	-0.470**	-0.438**	-0.479**	-0.396*	-0.391*	-0.047
	(0.204)	(0.219)	(0.218)	(0.207)	(0.205)	(0.220)	(0.214)
Extraversion		0.154	0.119	0.098	0.210	0.222	0.269
		(0.287)	(0.287)	(0.284)	(0.329)	(0.323)	(0.225)
Conscientiousness		-0.389	-0.471	-0.490	-0.401	-0.439	-0.400*
		(0.304)	(0.350)	(0.366)	(0.300)	(0.268)	(0.208)
General Reciprocity			-0.082	-0.045	-0.501	-0.461	-0.709
			(0.885)	(0.902)	(0.799)	(0.788)	(0.668)
Female				0.144	0.888	0.962	1.059
				(1.351)	(1.162)	(1.213)	(0.721)
Age				0.114	0.101	0.114	-0.000
				(0.103)	(0.089)	(0.087)	(0.045)
Risk					1.600*	1.775*	1.163***
					(0.907)	(0.944)	(0.390)
Lie						0.361	0.397**
						(0.407)	(0.159)
Motivation							-2.258***
							(0.530)
ll	-83.2597	-82.18567	-75.26452	-75.26452	-72.74261	-72.43181	-62.34356
N	126	126	126	120	120	120	120

Note: Each regression includes dummies for sessions. *p<0.10,** p<0.05, ***p<0.01

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