

# Greed vs. Love of Science in Young Economists A Field Experiment

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## 1. Introduction

Providing subjects with financial incentives is one of the trademarks of experimental methodology in economics. It is generally believed that incentives matter, at least in some types of tasks, e.g. making choices more selfish, increasing performance and reducing noise. Camerer and Hogarth [1999] review a number of papers addressing this issue. Still, hundreds of experiments show that even when substantial financial incentives are present, most subjects do not act solely to maximize their own payoff; rather, they are sometimes willing to sacrifice it in order to support, reward or punish others; apparent mistakes are also observed frequently. Theoretical efforts to explain these “anomalies” have been one of the main forces driving progress in behavioural economics.

Much less is known about the subjects’ motivation to come to the lab in the first place. If they are driven by anticipation of other than financial benefits of participating in experiments, by investigating them we may obtain clues that will help us understand behaviours seen as anomalous in view of the standard theory. In particular, to the extent that these non-financial motives appeal to a varying degree to different groups, behavioural differences between them may be explained. In particular, a behavioural difference between students majoring in economics and other fields is often reported (the former being more selfish and generally deviating less from the standard theory, see e.g. Frank and Schulze [2000]). It is often discussed in this connection [Frey and Meier 2003] whether the effect results from “nature” or nurture. One way of understanding these tendencies is in terms of greater appeal that non-monetary benefits of participating in experiments may have for non-economist participants. It is also an important question whether economic curriculum tends to strengthen or weaken such motivations.

Several non-pecuniary benefits of participation in experiments may be considered. To name but a few, (student) subjects may see an experiment as

an interesting time-filler between classes or an opportunity to meet their colleagues and interact with them; they may take pride and satisfaction from being able to contribute to the progress of science; they may be willing to please the experimenter (who may happen to be their professor) or they may think of experiments as a way to learn principles of economics (with less effort involved than would be necessary to study handbooks). Interestingly, some of the above-mentioned benefits seem to be more attractive to the students majoring in economics. While each of these alternative motivations may seem to be relatively weak in most subjects, it is not unreasonable to suppose that collectively they may sometimes be of importance when compared to that of the prospect of financial gains. This conjecture is the basis of the design of the current study, contrasting the appeal of the dollar against that of all alternative motivations taken together.

As it is probable that many factors affect participation decision, it may be difficult for the subjects themselves to assess their relative importance in a questionnaire. Further, some of these motivations may seem to be more socially desirable than others, thus biasing the results. For these reasons a field experiment seems to be a more attractive method than a survey. I have thus adopted this approach, comparing rates of response to two types of recruitment invitations, the first emphasizing the monetary rewards and the second-other benefits.

The general results concerning relative effectiveness of the two treatments and a follow-up study comparing behaviour of the groups recruited in two ways have been described in the companion report forthcoming in *Experimental Economics*. Here I focus on the comparison of treatment effects in various age groups of participants majoring in economics. It turns out that the treatment effect was particularly strong in first-year students, suggesting that the alleged economists' greed is brought from home rather than bred at the university.

The remainder of the paper is structured as follows. Section 2 reviews the related literature. Section 3 describes the design and procedures of the field experiment run and the data set obtained, Section 4 presents the findings and Section 5 contains a short discussion.

## 2. Related literature

Of course, this study is not the first one to manipulate invitations to experiments. The most closely related studies are in the field of psychology. Obviously, they focus on another type of experiments; further they almost exclusively investigate students of psychology as subjects and typically involve deception. MacDonald [1972] finds that subjects were more likely to volunteer to participate for course credit than for money or "for love of science". Also Sharp et al. [2006] conclude that extra credits result in higher sign-up rates. Studies also find that participants self-select to experiments with different

descriptions, depending i.a. on gender and personality traits [Jackson et al. 1989; Senn and Desmarais 2001].

The few related studies in economics were also focused on the behavioural differences resulting chiefly from self-selection under different recruitment procedures. For example, Harrison et al. [2009] show that manipulating information about show-up fee affects the risk attitude of the obtained sample. Eckel and Grossman [2000] find that subjects recruited in class tend to be more generous in the dictator game than real volunteers. List [2006] observes that sports-card sellers willing to participate in a lab experiment were more pro-social in the field than those who declined (albeit not significantly so). Noteworthy, Falk and Heckman [2009] claim that selection need not be viewed as a nuisance, especially given that it is possible to control subjects' demographic and psychological characteristics.

I am not aware of an empirical study comparing relative appeal of different motivations to register as a subject in economics experiments.

As mentioned before, this study is also directly related to a number of papers investigating the alleged greediness of economists and its possible sources. Ever since the seminal paper by Marwell and Ames [1981], it is widely believed that students of economics are more selfish than other people. These authors let their subjects play a public goods game, in which contributing to the "common pool" is individually irrational but efficiency-enhancing. It was found that economics majors only contributed 20% of their endowment on average, while other students—49%. Commenting on the economists' responses to the post-experiment questionnaire, Marwell and Ames remark that "it seems that the meaning of 'fairness' in this context was somewhat alien for this group". While this particular study was rightly criticized on methodological grounds (i.a. less-than-perfect match of auxiliary characteristics between the experimental group and the control group), it has nevertheless paved way for many a replication. For instance, Carter and Irons [1991] confirmed economists' relative greed or selfishness in ultimatum bargaining games.

Frank et al [1993] argued that such behavior results from training. In particular, they showed that students majoring in other fields become more cooperative in a Prisoner's Dilemma game as they grow older, while no such trend is visible for economists. They also found that completing a course in microeconomic theory, especially if it focused on game theory and industrial organization, led to more cynical and self-seeking answers in a lost wallet scenario. Such results are important and potentially disturbing: are we indeed indoctrinating our students to become non-cooperative, self-seeking citizens?

Field studies are scarce and generally do not confirm these findings. For example, Laband and Beil [1999] report that sociologists are more likely to unlawfully avoid the payment of professional association fees than economists. Frey and Meier [2003] find that only business students (and not stu-

dents of political economy) are less willing to contribute to the University of Zurich social funds and even business majors are not more selfish than lawyers. Further, while their contributions did decline over time, they did so to a lesser extent than e.g. in law school students.

A recent major questionnaire study by Cipriani, Lubian and Zago [2009] seems to suggest that economists' declared willingness to maximize profit and insensitivity to fairness is partly due to selection and partly due to learning. Overall thus, the evidence does not seem to be univocal and further research, especially involving field experiments, seems useful.

### 3. Design and procedures

Students of four departments of the University of Warsaw, namely the Faculty of Economic Sciences, the Faculty of Law and Administration, the Faculty of Journalism and Political Science and the Faculty of Philosophy and Sociology were sent e-mail invitations to register at the local experimental economics recruitment site.<sup>1</sup> The e-mail provided a link to the web page mentioning benefits of participating in experiments. Two treatments were used in this respect. Nearly half of the subjects<sup>2</sup> were only told about experiments as a quick and easy way to make some money (Pecuniary Treatment, PT) The other half was told that they would be enjoyable and would help them learn principles of economics in an interesting way; it was also emphasized that the experiments would be conducted as a part of research projects of the faculty as well as their colleagues (Non-Pecuniary Treatment, NPT). Here, the money was only mentioned in the end and partly in a footnote. (The web pages translated from the Polish language are available at [www.wne.uw.edu.pl/mkrawczyk/money.pdf](http://www.wne.uw.edu.pl/mkrawczyk/money.pdf) and [www.wne.uw.edu.pl/mkrawczyk/other.pdf](http://www.wne.uw.edu.pl/mkrawczyk/other.pdf) respectively. PLN1 stood at about Euro .24 at the time, with typical simple student jobs paying about PLN15 per hour.) The e-mails were sent as a "hidden copy" (thus students' addresses were not disclosed to one another), the discussion forum at the e-learning platform from which part of the e-mails were taken was temporarily disabled. Of course, it cannot be excluded that some of the students exchanged information with their colleagues possibly finding about the other treatment. This might have weakened treatment effects. In any case, the addresses of the web pages were such that someone who had not been provided a link was highly unlikely to find them.

The e-mails were sent in the third week of October (2009), the first month of the academic year in Poland; majority of first-year students were thus fresh out of high school. To the best of my knowledge it was the first large-

<sup>1</sup> ORSEE software, Greiner [2004] was used.

<sup>2</sup> The division was performed based on the first letter of the student's last name, the upper part of the list receiving the Non-Pecuniary Treatment and the lower—the Pecuniary Treatment. I was not able to find any evidence that one's position in the alphabetical order of (Polish) last names correlates with traits, skills, academic achievements etc.

-scale recruitment campaign to economics experiments at the University of Warsaw and most certainly the first advertising this particular ORSEE-based website. It appears that a non-negligible minority of non-first year economics students had participated in experiments run at the Faculty before; most of these were classroom ones, without monetary payments and sometimes involving deception. A small fraction of students might have also participated in experiments run at the Faculty of Psychology.

**Data set**

In total, over 13,000 e-mails were sent, of which about 900 to economists. For the latter, the first and last name (and thus gender), e-mail address and the year of study were known. Unfortunately, due to data confidentiality, I have not been given access to any data of non-economists—the only available variable is the gender. Tables 1 and 2 report numbers of e-mails sent to economists and non-economists, broken down along available variables.

**Table 1:**

**Descriptive statistics: number of economics students approached**

gender/year	1	2	4	5	total
female	155	166	94	46	461
male	183	139	80	45	447

**Table 2:**

**Descriptive statistics: number of non-economics students approached**

gender	
female	7044
male	5147

For those who decided to register in our database, first and last name, field of study and the year of admission to the university as well as the precise time of registration was stored.

**4. Results**

In order to make comparisons of response rates in different groups, a decision had to be made regarding the period within which an invited participant had to register in the database in order to be considered a positive response. Allowing only a short time span after the e-mail would result in a low number of registrations and thus low statistical power. For an overly long time period, however, the number of individuals consulting their registration decision with their colleagues who might have received the other version of the invitation would increase, thus dissolving the treatment effect. The time span

of 72 hours was picked because it appeared that many students would not check their university mailboxes very often. In practice, analysis using other time spans (24 hours, 48 hours, 96 hours, etc.) delivers qualitatively analogous results; these are briefly mentioned below.

**Table 3:**

Response rates within 72 hours, by gender, academic major and treatment

	econ		non-econ	
treatment/gender	male	female	male	female
pecuniary	20,0%	16,0%	2,0%	1,6%
non-pecuniary	12,1%	12,4%	1,1%	1,0%

Clearly, the PT was more effective than the other one. Overall it led to response rate of 2.8% (205 out of 7281) compared to 1.9% (110 out of 5818) in the NPT and the effect was not modulated by gender or academic major. The main effect for economics was, however, very strong (positive) and highly significant. This effect is probably due to economists’ lower costs of reaching the lab (situated in the same building), greater familiarity with experimental economics and greater interest in it as well as possibly knowing the experimentalists—faculty members who had signed the e-mail. Further, it is very likely that the quality of e-mail database of non-economists was low, as evidenced by such auto-responses as “Dear Sender, I never check this e-mail box so your message will never be read.”

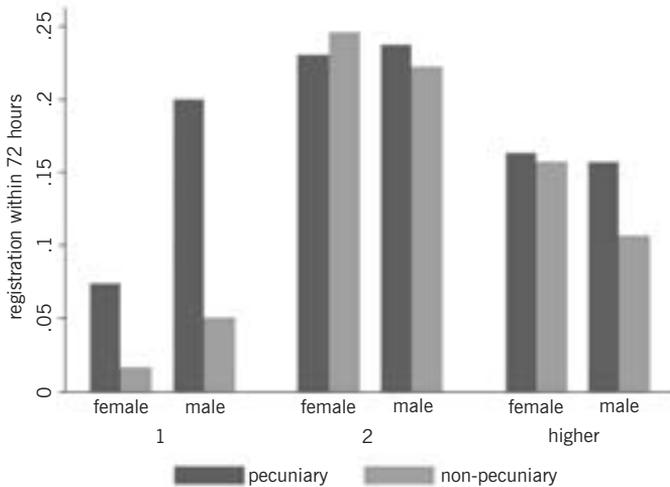
This suggests that pecuniary motivation played the decisive role in most participants of the study; when other possible reasons to participate were primed, the response rate fell.

When we restrict our attention to economists only, the data permits analysing the impact of our variable of interest, namely the amount of university education, on the treatment effect. Figure 1 shows response rates, depending on the year in which given participant is enrolled (as the number of observations for higher years is much lower, these are pooled).

Figure 1 reveals a striking pattern: the treatment effects is by far strongest for the first-year students. This is the most money-oriented group that I can identify. Pearson’s chi-square tests performed separately for each year of study confirm that the treatment effect is only significant (and strongly so) for the first-year students. Several alternative explanations of this phenomenon may be plausible.

First, it could be that older students have better alternative opportunities to earn money, which makes the Pecuniary Treatment less attractive for them. However, if higher opportunity cost of time in older students played the crucial role, we would expect to see a similar pattern at other faculties. While there is no data on the year of study in the non-economist sub sample, as mentioned before, thus no image like Figure 1 may be produced, still, we

know that year of study was orthogonal to assignment to treatments. Therefore, if there was an interaction, the distributions of the year of study would differ between treatments in registered non-economists. In fact, the fraction of first-year students is identical in the two treatments. Further, we see that it is rather the response rate in the Non-Pecuniary treatment being lower among first-year students than their older colleagues, not the response rate in the Pecuniary Treatment higher.



**Figure 1.**  
Response rate in economists, by gender and year of study

Second, as pointed out by a Referee of an earlier version of the paper, it could be that experience with economics experiments mitigated treatment effect in non-first year economists—they could be aware of the fact that these experiments bring money. In view of the limited prevalence of paid experiments at the Faculty prior to the recruitment campaign, as highlighted before, this possibility is unlikely to account for the effect in question.

Third, as also pointed out by a Referee, the observed pattern could potentially result from selective drop-out of the relatively money-oriented economics students. Again, this is not very plausible as the main explanation as the drop-out rate is fairly low at the Faculty.

Finally, and I find no compelling reason to refute this supposition, it may be that training in economics strengthens non-pecuniary motivations to participate (willingness to learn, to support research efforts in economics etc.). In any case, most probably each of the effects sketched before contributes to the observed pattern.

## 5. Discussion

This study allowed investigating experiment participants' motivations as reflected by their willingness to register depending on the aspects of participation in experiments that are emphasized. It appears that purely pecuniary motive is the main force driving subjects to the lab.

We do not find the interaction with sex or academic major as speculated. It appears thus that if economists are found to behave more selfishly in experiments, it is not because they are generally particularly money-oriented (while non-economists come to the lab for fun, education etc.). The fact that the treatment effect was not any stronger in economists can be understood in terms of their interest in the educational aspect of experiments and the willingness to support the research efforts of the faculty.

Interestingly however, we observe a strong effect of the year of study in economists but not other students whereby the treatment effect fades away with education. The optimistic interpretation of this result is that starting with a relatively greedy selection of applicants, the faculty are able to awake their interest in contributing to academic research and learning the principles of economic science. This observation strongly supports the claims made by Carter and Irons [1991] and Frey and Meier [2003] that the observed selfishness of economists is the matter of selection, not training.

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**A b s t r a c t Greed vs. Love of Science in Young Economists. A Field Experiment**



This paper reports a field experiment involving manipulation of invitations to register in an experimental economics subject database. Two types of invitations were sent, one emphasizing pecuniary and the other non-pecuniary benefits of participation. It was found that first-year economics majors were much more money-oriented, i.e. relatively more attracted by the first type of invitation, than any other group. This supports the view that the often-observed selfishness of economists results from selection and, if anything, is mitigated by training.