



A comprehensive comparison of students and non-students in classic experimental games



Michele Belot^{a,*}, Raymond Duch^b, Luis Miller^c

^a School of Economics, University of Edinburgh, Room 3.11, 31 Buccleuch Place, Edinburgh, UK

^b Nuffield College, University of Oxford, New Road, Oxford OX1 1NF, UK

^c School of Economics, University of the Basque Country (UPV/EHU), Av. Lehendakari Aguirre 83, 48015 Bilbao, Spain

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ABSTRACT

This study exploits the opening of the experimental lab in Oxford to compare the behavior of students and non-students in a number of classic experimental games, some of which involve other-regarding preferences (Trust Game, Dictator Game, and Public Goods Game) and others which have game forms that are strategically challenging (Beauty-contest and Second-price Auction). We find that students are more likely to behave as selfish and rational agents than non-students. Our findings suggest that students are different than non-students with respect to their social preferences and their ability to reason strategically. Experiments using students are likely to overestimate the extent of selfish and rational behavior in the general population.

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1. Introduction

Most subject pools in experiments conducted in social sciences are drawn from undergraduate student populations (Morton and Williams, 2009; Peterson, 2001). Based on a survey of 60 laboratory experimental economics papers published in major experimental economic journals, Danielson and Holm (2007) found that only four did not use students as subjects. Students are usually perceived as a “convenience sample” and preferred to non-students for methodological reasons. We expect them to understand the instructions better; students are thought to be more comfortable with abstract reasoning; and they are also considered to be a more homogenous population. These advantages allow experimental researchers to obtain insights at relatively low costs and with small sample sizes. But, an important question is whether students differ in fundamental determinants of behavior in economic games. For example, do they differ in their ability to reason strategically, in their attitudes toward risk or in their pro-sociality? And does this matter for their behavior in experimental games?

We invited 63 students and 65 non-students to participate in the first experiment conducted in the Nuffield Centre for Experimental Social Sciences. The idea here is simply to compare two different samples that are available to experimentalists, neither of which can be claimed to be representative of the whole population. All participants played the same five classic experimental games; some of which involve other-regarding preferences (Trust Game, Dictator Game, and Public Goods Game); and others which have game forms that are strategically challenging (Beauty-contest and Second-price Auction). We identify the difference in behavior between the two subject pools in each of these games. To this, we will use two

* Corresponding author.

E-mail addresses: michele.belot@ed.ac.uk (M. Belot), raymond.duch@nuffield.ox.ac.uk (R. Duch), luismiguel.miller@ehu.es (L. Miller).

measures: one is the percentage of people playing the Nash equilibrium strategy based on monetary payoffs, assuming selfishness and rationality and common knowledge of rationality. The second measure is the average decision in each of the five games (e.g. average monetary transfer, average guess, etc.).

We find that the behavior of the two subject pools can differ significantly although these differences vary across games. In games that involve other-regarding preferences, students are two to three times more likely to choose the equilibrium strategy than non-students. In contrast, the differences in behavior are smaller and not always significant in games that do not involve other-regarding preferences. We find no evidence that these differences are due to differences in levels of comprehension of the games. The differences are most dramatic for the simplest of the games (the Dictator Game), but also subsist when subjects have time to learn. The Public Goods Game was repeated 10 times and the differences are as pronounced at the beginning as at the end of the experiment. Finally, we find that behavior is correlated with individual covariates such as age, and cognitive ability in games involving cognitive reasoning.

The conclusion we draw from our study is that there are large differences in behavior across sub-groups of the population, but that these differences are more pronounced in games involving other-regarding preferences than in other games.

The rest of the paper is structured as follows. Section 2 presents the related literature, Section 3 the experimental design, Section 4 the results, and Section 5 concludes.

2. Related literature

Despite the large reliance on students in laboratory work in economics, there is only a limited number of methodological studies comparing students to non-students (Carpenter et al., 2005, 2008; Anderson et al., 2013; Falk et al., 2013). Other social sciences (e.g. psychology, marketing) with a long tradition of experimental work have identified important behavioral differences between students and non-students, for example in personality tests, perceptions and attitudes, etc. A comprehensive meta-analysis conducted by Peterson (2001) suggests that student samples tend to be much more homogeneous than non-student samples and that the treatment effect sizes differ significantly across these two types of samples. However, we know relatively little about differences in behavior in economic games.

There are a few studies comparing pro-social behavior between students and other groups of the population. Carpenter et al. (2005) compares students and workers in both a laboratory and a field setting and find that workers were more generous in the Dictator Game while students made more generous offers in the Ultimatum Game. A comparison of contributions of students and community members in a charitable donation version of the Dictator Game found that students were much less generous (Carpenter et al., 2008). More recently, Anderson et al. (2013) find that self-selected students appear considerably less pro-social than self-selected adults in a prisoner's dilemma game. Cappelen et al. (2015) show that a nationally representative adult sample behaves more pro-socially than a student sample. Falk et al. (2013) find that non-students make significantly more generous repayments in a trust game. These authors conclude that measures of pro-social behavior obtained from student convenience samples will be significantly lower than those from samples that are more representative of the broader population.

Next to these, there are a couple of studies comparing behavior in games that do not involve other-regarding preferences. A classic study is the comparison of newspaper and lab Beauty-contest experiments (Bosch-Domenech et al., 2002) which concludes that the lab and field generate comparable results. Depositario et al. (2009) find no differences in the bidding behavior of students and non-students in a uniform price auction.

Hence there is some evidence that the behavior of student and non-student subject pools differ. But the evidence remains very limited and typically focuses on one or two games. We have implemented a set of experiments designed to assess whether, and how, these subject pool differences vary across types of games.

3. Experimental design and sample

3.1. Description of samples and experimental sessions

The experiment was carried out in the Nuffield CESS lab in Oxford. It was the first experiment conducted in the lab. Hence, the subjects had not yet been exposed to experiments carried out in the lab. Students were recruited mainly among the undergraduate and graduate students at the two universities located in Oxford, while non-students were recruited in various ways, such as e-mailing non-academic staff working at the university, contacting local shops, placing advertisements in local newspapers and local pubs.¹

¹ The advertisement mentioned that we were looking for people from all walks of life to participate in decision-making experiments and surveys in social sciences. We also mentioned that participants should expect to earn between 10 and 15 pounds per hour. The typical gross pay of students working for Oxford university is 12 pounds, and the average salary of an administrator in the UK in 2008 was 16,994 pounds, which corresponds to an hourly rate of 8.5 pounds (Source: <http://www.mysalary.co.uk/>). Because the participants are informed about their expected payment, we would not expect systematic differences in the opportunity cost of participating. These two populations are both local and both prepared to participate in experiments. Thus, we are comparing two pools that could realistically be used in experiments conducted in Oxford.

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