
ECONOMICS

Sociology

Dzionek-Kozłowska, J., & Neneman, J. (2022). Are economic majors “indoctrinated” by their education? Public good game quasi-experiment. *Economics and Sociology*, 15(2), 110-124. doi:10.14254/2071-789X.2022/15-2/7

ARE ECONOMIC MAJORS “INDOCTRINATED” BY THEIR EDUCATION? PUBLIC GOOD GAME QUASI-EXPERIMENT

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Received: September, 2021

1st Revision: April, 2022

Accepted: June, 2022

DOI: 10.14254/2071-
789X.2022/15-2/7

ABSTRACT. Economic education is commonly blamed for negatively affecting students’ values and attitudes. Students of economics are repeatedly reported to differ from other majors. The differences are commonly explained by the learning effect (the indoctrination hypothesis) and the self-selection of specific persons to economics. We aim to contribute to the nurture vs nature debate on economics students by testing the indoctrination (nurture) and the self-selection (nature) hypotheses. Working with undergraduate economics and non-economic majors (N=286), we ran a Public Good Game (PGG) quasi-experiment. To test the self-selection hypothesis, we compared levels of donation in the PGG by both subsamples. To test the indoctrination hypothesis, we (1) analysed the results of economics students at different stages of their education and (2) juxtaposed their donations in the PGG with their academic performance. If economic education affects student attitudes, those who master economic theory better should be more “indoctrinated” and, as such, less eager to donate their endowments to the common fund in the PGG. However, no difference between the results of the first-year and second-year students has been found. Also, no correlation between exam scores and students’ donations in the PGG has been revealed. Nonetheless, we have detected a statistically significant difference between the economics and non-economics majors, which allows us to conclude that economics students’ atypicality comes from their self-selection of economic studies and is not attributable to economic teaching.

JEL Classification: A13,
A20, C72, Z13

Keywords: economic education, Public Good Game, self-interest, social norms, Poland

Introduction

Economic and business education is often presented as a threat to students’ values and ethical standards (cf., for instance, Boylan, 2015; Etzioni, 2015; Ghoshal, 2005; Spiegelman, 2020). Such concerns are expressed more than ever when corruption scandals or business malpractices are uncovered. A debate on the supposed negative, value-related by-product of

economic teaching has been raging for more than half a century, and in the course of this discussion, economics students have been reported as being less generous (Bauman & Rose, 2011; Carter & Irons, 1991; Frank et al., 1993; Kaiser et al., 2018), trustworthy (Dasgupta & Menon, 2011), and cooperative (Cadsby & Maynes, 1998), yet greedier (Wang et al., 2011), more corrupt (Frank & Schulze, 2000), and cynical (Frank et al., 1993; Krick et al., 2016). Aside from regarding those differences as a consequence of economic education (the indoctrination hypothesis), they have also been seen as a result of the self-selection of a particular class of people to economics and business programmes (the self-selection hypothesis).

The present study aims to contribute to the nature vs nurture debate regarding economics students. Working with a sample of Polish undergraduates (N=286), we conduct a Public Good Game (PGG) quasi-experiment where they face a decision-making situation with a conflict of individual and social (group) interests. Considering the numerous previous studies, initially, we expected to find support for both the indoctrination and self-selection hypotheses.

To test the indoctrination hypothesis, we implement a new two-phase procedure. First, we analyse the outcomes of the first- and second-year economics students in the PGG. Second, to deepen our analysis of the nurture effect, we enrich our empirical evidence by recording their academic performance. We assume that if economic education affects students' attitudes and decisions, those who mastered economic concepts better should be more "touched" by the alleged negative side-effects of economic teaching. Knowing that according to game theory the rational decision in the PGG would be to keep all the resources for themselves, we expect to find a negative correlation between the economists-to-be exam scores and their contributions in the PGG.

To test the self-selection hypothesis, we take the standard approach, comparing decisions by the first-year economics and non-economics majors (students of administration, biology, mathematics, and social policy).

Additionally, we attempt to shed light on the role of culture as a modifier of students' choices in game-based experiments. Thanks to implementing the PGG in our research instrument, we are able to compare the Polish sample results to the findings of studies based on the same pattern undertaken in other countries.

Our data allow us to support the self-selection hypothesis—we confirm that economists contribute less than non-economists. Thus, they are indeed somehow different. However, to our surprise, we do not find empirical evidence to support the indoctrination hypothesis. No statistically significant differences between the economics and non-economics students' contributions in the PGG are recorded. What is more, we also do not find a correlation between academic performance and the level of donations in the experiment. These findings cast serious doubt on the supposed harmful side-effect of economic teaching on students values and attitudes.

Another surprising finding is the highly untypical distribution of donations in the PGG, with a mode at the 50/50 split (typically, the distribution is bimodal, U-shaped). Such an anomaly is detected in both the economic and non-economic subsamples which might be read as a sign of the Polish culture. However, to view it as a consequence of culture-embedded factors would require further studies to confront this outcome with empirical evidence collected with the same research procedure from economics and non-economics students of different cultures and ethnicities.

The line of reasoning developed in the present paper begins with a review of earlier empirical studies dedicated to the influence of economic education. Against such a background, we describe our research method and characterise the respondent sample we worked with. Next,

we report the results of our study. These outcomes are discussed in the subsequent section. Finally, we conclude and outline directions for further research.

1. Literature review

Empirical investigations related to the supposed influence of economic education on students' worldviews were initiated as early as the mid-1960s. Dawson (1966) examined how studying the subject modified economics undergraduates' views on trade unions and labour market policies. Lloyd (1970) analysed differences between economics and non-economics majors' approaches to collective bargaining, while Thompson (1973) examined economics and other students' assessments of free trade. Scott and Rothman (1975) explored economics graduates' political attitudes to determine whether economic teaching produced future liberals or conservatives. All the studies were based on participants' responses given in surveys. The first three studies revealed differences of opinions between economists and non-economists. Those findings were seen as neither controversial nor even surprising since all the analysed problems were economic or closely related to economic issues.

The discussion on the effects of economic teaching was invigorated in the early 1980s with a groundbreaking paper by Maxwell and Ames (1981). They reported a series of eleven lab experiments on free-riding in public good games, informing that, contrary to the rationale of game theory, all but one group of respondents said they would contribute significantly to the common fund. The group willing to donate considerably less were the economics graduates. That finding was directly announced in the paper's title: Economists free ride, does anyone else? The answer to the question was negative—nobody else but economists free rode, at least when Maxwell and Ames' respondents were considered. That very accusation addressed to the economic profession went far beyond the earlier discussion, which focused on the (quite predictable) differences in opinions on economic questions between economists and others. Although economic education was not blamed by Maxwell and Ames for transforming people into serial killers (cf. Frank et al., 1996, p. 187), it was presented as a serious threat to the economists-to-be morality.

Maxwell and Ames' (1981) paper led to a wave of research confirming economists' uniqueness with lab experiments grounded in game theory. The Ultimatum game was employed to demonstrate differences in economists' and non-economists' sense of fairness (Kahneman et al., 1986; Carter & Irons, 1991). The Prisoner's Dilemma game served to show that economists are less eager to cooperate (Frank et al., 1993; Seguin et al., 1996; Cadsby & Maynes, 1998; Lanteri & Rizzello, 2007; Ahmed, 2008) while the Dictator game was used to talk about their lower generosity (Wang et al., 2011; Gerlach, 2017; Kaiser et al., 2018). The sequential trust games implemented by Dasgupta and Menon (2011) and Haucap and Müller (2014) led them to conclude that future economists are both less trusting and less trustworthy than other students.

Besides confirming the differences between economists and others, another problem was to figure out why economists were different. The discussion revolved around nurture vs nature arguments. The former was expressed under the name of the indoctrination hypothesis, searching out the reasons in economic education that make economists the way they are. The latter resulted in the self-selection hypothesis, which claims that economics and business programmes were chosen by people who were different anyway, before attending any economic lecture.

Over time, other research methods were also implemented. Frey and Meier (1993) and Bauman and Rose (2011) used natural experiments to make inferences. Both teams of scholars analysed vast sets of data (containing more than 96,500 and 65,000 observations, respectively)

on students' voluntary contributions to university social funds. Both teams supported the self-selection hypothesis and did not detect evidence that would confirm the negative role of economic education on students' generosity.

Yezer, Goldfarb, and Poppen (1996) and Laband and Beil (1999) turned to field experiments. The so-called "lost-letter" experiment undertaken by Yezer, Goldfarb, and Poppen allowed them to demonstrate that in a realistic, outside-laboratory environment, the economists were not less, but more honest than the others (the rate of return of unsealed letters with 10 USD was 25 percentage points higher for the former group than the latter). The same conclusion came from the study by Laband and Beil (1999), who asked professional economists, sociologists, and political scientists to disclose their actual yearly incomes and compare those pieces of information with the earnings they previously declared to assign the levels of fees for three organisations: the American Sociological Association, the American Political Science Association, and the American Economic Association. Again, the economists were the most honest. Obviously, the studies by Yezer, Goldfarb and Poppen (1996) and Laband and Beil (1999) challenge the statement that economists are less moral than other people.

Numerous scholars have returned to surveys and questionnaires. Some studies asked about preferable allocation mechanisms (Ng, 1988; Frey et al., 1993; Whaples, 1995; Faravelli, 2007; Cipriani et al., 2009; Haucap & Just, 2010; Marcis et al., 2014; Goossens & Méon, 2015; Rosengart et al., 2020) and other economic issues, such as labour market regulations (Haferkamp et al., 2009) and trade and immigration policies (Jacob et al., 2011). However, there were also researches directly dedicated to ethical attitudes (Tse & Au, 1997; Gandal et al., 2005; Neubaum et al. 2009; Lopes et al. 2015; Hammock et al., 2016; Krick et al. 2016; Dzionek-Kozłowska & Rehman, 2017a; 2017b; Delgado et al., 2019) and moral dilemmas in both economic (Rubinstein, 2006; O'Clock & Okleshen, 1993; Frank & Schulze, 2000; Cipriani et al., 2009; Brosig et al., 2010; Rosengart et al., 2020) and general contexts (Krick et al., 2016; Hummel et al., 2018; Dzionek-Kozłowska & Rehman, 2019).

In the course of that half-a-century debate about what makes economists different, two additional factors were frequently pointed out as variables that modify outcomes of research: gender and culture. Males were often reported as acting closer to the rationale of economic theory, but at the same time, they were less susceptible to the influence of economic teaching (cf., for instance, Dawson, 1966; Scott & Rothman, 1975; Frank et al., 1993; Whaples, 1995; Seguin et al., 1996; Tse & Au, 1997; Frank & Schulze, 2000; Dzionek-Kozłowska & Rehman, 2017b). Awareness of such findings makes it necessary to control gender in empirical studies.

The importance of culture was noticed slightly later. For the first two decades after the publication of Maxwell and Ames' (1981) paper, the arguments used were based on empirical evidence gathered at universities in the US and other western countries – as it was the case with many other scientific debates (cf. Henrich et al., 2005). Replicating those experiments outside the western world and studies that purposely compared respondents from different countries have demonstrated that culture matters (Tse & Au, 1997; James et al., 2001; Ida & Oda, 2011; Dzionek-Kozłowska & Rehman, 2017a; 2017b; 2019). For instance, in contrast to previous findings, Tse and Au (1997), working with New Zealanders, did not discover inconsistencies between ethical standards of business and non-business students. Ida and Oda (2011), who presented Japanese economists and non-economists with the Prisoner's Dilemma game, did not detect any significant discrepancy between the rates of defection declared by either group of respondents. Then again, James, Soroka and Benjafield (2001) found differences between contributions declared by the Canadian sample of respondents with whom they worked in the Ultimatum bargaining game and the American students investigated earlier by Carter and Irons (1991). In turn, Dzionek-Kozłowska and Rehman (2017a; 2017b) reported dissimilarities between levels of cooperativeness of Chinese and Romanian students of economics and their

Polish counterparts. Therefore, if universal statements about the relationship between economic teaching and students' behaviour are to be made, culture-embedded factors should be considered.

2. Method and sample

The present study aims to test both the indoctrination and the selection hypotheses. Additionally, we intend to shed light on the role of culture as a factor that potentially affects the strength of the supposed influence of economic education on students' attitudes. The method used to empirically test the hypotheses was a one-shot Public Good Game quasi-experiment in the voluntary contributions version,¹ conducted with groups of economics and non-economics majors. However, as a supplementary source of empirical evidence, we also regard the exam scores of the latter subsample. Hence, from the perspective of our research, the exams are to be regarded as a natural experiment.

Our approach to testing the indoctrination hypothesis was based on a two-step procedure elaborated for our previous research (Dzionek-Kozłowska & Neneman, 2021). Thus, first, we compare the PGG outcomes of the economics students to check whether there are any differences between the average levels of donations to the common fund by the members of each group. Lower average contributions of the second-year students might have been regarded as a preliminary sign in favour of the indoctrination hypothesis. Second, to deepen our understanding of the supposed influence of economic teaching, we juxtapose the students' decisions in the PGG with their academic performance. This second phase of our research procedure is based on the assertion that if economic education does indeed exert a negative influence on students' attitudes, those who mastered the content of economic teaching should be more affected by it. Hence, their average donations to the common fund should be lower. Knowing that microeconomics is commonly seen as a principal source of economic "indoctrination", we referred to the grades the students received in the final exams in the Microeconomics 1 and Microeconomics 2 courses. We are looking for a (negative) correlation between the level of contributions in the PGG and their grades.

To test the selection hypothesis, we compare the results of two cohorts of first-year students: economics majors and their non-economics counterparts. With regard to the previous findings, we hypothesise that the average level of contributions declared by the economists to the common fund would be lower than those declared by the non-economists.

Conducting the PGG experiment allows us to compare the results of Polish students with the outcomes of previous PGG-based research in different countries, i.e., the U.S. (Maxwell and Ames, 1981) and Denmark (Kaiser et al., 2018). Thereby, we gain an indirect way to address the influence of culture on students' choices.

Our study was conducted in October 2020 and January and May-June 2021 at the University of Lodz, Poland. Both the questionnaires and the exam papers were collected online (in the academic year of 2020/2021, all the classes were organised in this manner because of the COVID-19 pandemic). A link to the questionnaire was shared with the students via the lecture chat. Participation in the experiment was voluntary. The questionnaires were anonymous, however coded due to our eagerness to juxtapose the economics students

¹ The PGG may be structured according to two main patterns: the *voluntary contributions* version and the *common-pool resources* version. In the former, the initial endowments may be divided between the sum kept for oneself and the sum donated to the common fund. The amount of tokens gathered in the common fund is then multiplied and equally distributed between all the players. In the latter, instead of donating to the group fund, the players may withdraw a limited part of the common fund established at the initial phase of the game. This time, the multiplied and distributed sum is the amount left in the group fund (Henrich et. al, 2005, p. 798).

contributions in the PGG with their exam performance. All the students' decisions were confidential.

The questionnaire was composed of three types of items. First, the respondents read the following narrative:

To celebrate the end of the untypical, fully online exam term, the authorities of our department decided to prepare numerous attractions for students—university promotional products, vouchers for textbooks, a promise to organise a post-COVID party, among others. Amongst the attractions prepared for your group, there is a special game played according to the following rules:

- 1. Each of you will be given 10 tokens with a monetary value of 1 PLN each.*
- 2. You may divide these tokens between those you keep for yourself and those donated to the common fund of your group. You may donate any number of tokens, between 0 and 10. It means you can decide not to contribute to the common fund at all.*
- 3. Your group will gain twice as many tokens as you collect in the common fund, i.e., if you collect X tokens, you will get another X from the university.*
- 4. This collected and doubled number of tokens will then be equally divided between all of you, regardless of how much you have decided to donate to the common fund initially.*
- 5. After the game, you may use your tokens for payment in all the coffee shops, tuck shops, and the cafeteria on campus.*
- 6. Your donation is confidential; nobody will know how much you gave.*

How many tokens would you like to donate to the common fund?

(please, pick a number on the scale below)

After reading the narrative and declaring their contributions to the group fund, the participants were invited to explain the reasons behind their decisions. There was no word or character limit for their comments, and leaving a comment was not compulsory.

Additionally, there were three closed items asking for gender, major, and year of studies. The study was undertaken in Polish with groups enrolled on the programmes in Polish only. Aware of the high cultural and ethnic homogeneity of Polish society (Statistics Poland, 2015), we decided not to control the cultural background nor the ethnicity of the respondents.

The second source of empirical evidence was the economics students' papers from the final exams in Microeconomics 1 (the first-year students) and Microeconomics 2 (the second-year students). Although we took into consideration the overall exam grades, as the most important "variable" we took the grades the students received from the exam items intended to evaluate how well they had mastered game theory.

In the first phase of our research, we collected 293 responses – 117 from the first-year economics students, 98 from the second-year economics students, and 78 from the non-economics majors. The questionnaires were submitted by 293 students out of 339 enrolled to the programmes and attending the classes, thus, the average response rate reached 86%. However, the number of usable questionnaires dropped to 286 as seven economics students decided not to take the exam (three persons from the first and four persons from the second year). Our sample comprised 208 economics students and first-year students of administration (N=36), biology (N=16), mathematics (N=13), and social policy (N=13).

In our general sample, there were 195 females (68%) and 91 males (32%). The share of women in the non-economics cohort was slightly higher, at 72%; however, there was a difference of just five percentage points between the male/female ratio in both subsamples.

3. Results

As expected, the non-economics undergraduates donated a higher share of their tokens to the common fund. The average donation was 6.31 tokens, which constituted 63% of the

resources at their disposal. For the first-year economics students, the average contribution was 4.72 tokens only. The difference between the first-year economists and non-economists was statistically significant ($z = -3.39$, $p < .001$). Only three non-economics majors (4%) decided to keep all the tokens for themselves, in contrast to 41 economics students (20%). The 50/50 split was equally popular in both groups (approx. one-fourth of the respondents decided to give up half of the initial endowment to the common fund), while donating all ten tokens, was slightly less popular among the economics undergraduates than in the non-economics subsample (27% and 22%, respectively). The detailed distribution of donations to the common fund is presented in Figure 1.



Note: The surface area of each bubble corresponds to the number of respondents who chose to contribute a given number of tokens to the common fund.

Figure 1. Distribution of donations to the common fund by the economics and non-economics majors

Source: own data.

Among the non-economists, the most generous group were the mathematicians, while those who were less ready to contribute to the common fund were the social policy majors. The average donations of all the subsamples are given in Figure 2.

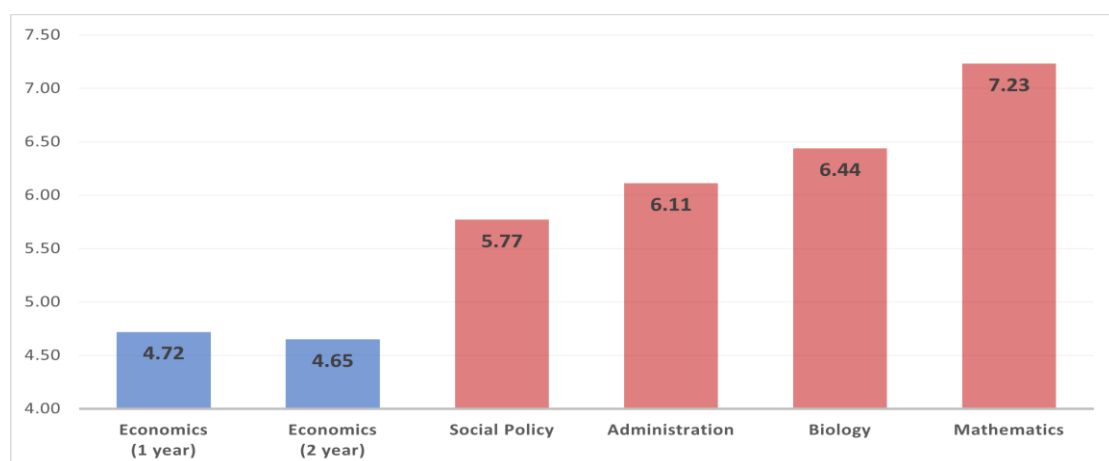


Figure 2. The average donations of all subsamples

Source: own data.

To our surprise, the difference between the first- and second-year economists proved to be insignificant. The average contributions of the economists were practically the same,

irrespective of their level of studies. Therefore, the difference between the first- and second-year economics students donations was not statistically significant ($z = 0.02$, $p = .98$). The statistics relating to economists, as well as the non-economics majors, are shown in Table 1.

The second phase of testing the indoctrination hypothesis, i.e., the analysis of the economic students grades obtained in the final exam in Microeconomics, allowed us to reexamine the indoctrination hypothesis. As expected, all the correlation coefficients between the students' scores (expressed in percentages, as a share of correct answers to the maximum number of points possible to collect) and their donations in the PGG were negative. However, the values of these correlation coefficients were extremely low. For the first-year students' cohort, they reached -0.04 when items checking their command of game theory were considered, and -0.07 for the general exam scores. For the second-year students, these coefficients equalled -0.09 and -0.02, respectively.

Table 1. The statistics for economics and non-economics majors

Major	N	Average donation	% of the max. donation	Standard Dev.	Mode
Economics	208	4.69	47%	3.55	5
1 st -year students	114	4.72	47%	3.57	5
2 nd -year students	94	4.65	46%	3.55	10
Non-Economics	78	6.31	63%	2.79	5 ; 10
General sample	286	5.13	51%	3.43	5

Source: own data

Thirty-eight percent of students left comments clarifying their decisions. The non-economics majors were more reluctant to share their thoughts on the reasons behind the contributions they made. Only 24 (31%) decided to explain their choices, whereas 85 (41%) economists did so.

In contrast to numerous previous studies, our evidence do not reveal any significant differences between males and females. The average contribution of the males was 5.02 tokens, while for the females, it was only 0.15 tokens higher. The female economists were marginally more willing to donate than the males (i.e., 4.83 and 4.41 tokens, respectively), yet the non-economist women were slightly less ready to contribute than the men (i.e., 6.05 vs 6.95 tokens).

The *Graph 1* shows that the level of different perception of independent variables in different countries. Bosnia and Herzegovina regarding the level of transition crisis is in worst situation than Serbia and Montenegro. Also, the negative influence of independent variables is the stronger in Bosnia and Herzegovina, after that in Serbia, then in Montenegro. Montenegro is in better situation than other countries, in all researched aspects. The existence of differences is expected because in the previous process of transition various economic, political, institutional and social changes have been realized. There are also other factors which have not been examined in this paper. Still, presented results clearly show similarity of models of influence and functional dependency, on the basis of common factors of influence research.

4. Discussion

In accordance with the outcomes of the vast majority of previous studies, our research confirms that economists are different. The unquestionable weakness of all those studies, ours included, is that conclusions are drawn from empirical evidence collected in a lab/classroom or gathered from answers in survey questionnaires and not from observing their real behaviour. However, conducting field experiments in the 2020/2021 academic year was almost impossible

due to lockdowns caused by the COVID-19 pandemic. Aware of this drawback, we cannot directly challenge the results of the field experiments by Yezer et al. (1996) and Laband and Beil (1999), undermining the discrepancy between economics and non-economics students. To partially overcome this problem, we implemented a realistic narrative in our research instrument: organising a student game sounded believable to our respondents, the signs of which we found in the comments (e.g., “I like these kinds of actions”, “It’s only 10 zlotys”, “I am waiting for more attractions!”).

Turning to the two main lines of explanation of the difference between economists and other students, our data only provide support for the self-selection hypothesis. Both methods used to capture the influence of economic education failed to do so. In particular, we argue that the lack of correlation between students’ exam performance and their contributions in the PGG casts serious doubts on the existence of the “indoctrination” effect. Apparently, a better understanding of economic theory does not translate into acting according to the economic rationale in more realistic circumstances.

Such a conclusion, i.e., support for the nature side of the debate accompanied by no evidence for the nurture effect, was also drawn by Frey and Meier (2003), who inferred it from a natural experiment, Frey et al. (1993), who gathered their data with a questionnaire on the allocation mechanism, Carter and Irons (1991), Dzionek-Kozłowska and Neneman (2021), Frank and Schultze (2000), Haucap and Müller (2014), and Mettrins and Warning (2014), who ran a variety of game-based lab experiments, and Gandal et al. (2005), Krick et al. (2016), Dzionek-Kozłowska and Rehman (2019), and Delgado et al. (2020) who analysed students’ values and ethical orientations. However, there are scholars who found confirmation for both self-selection and teaching effects (cf. Faravelli, 2007; Cipriani et al., 2009; Haucap & Just, 2010; Goossens & Méon, 2014; Kaiser et al., 2018; Rosengart et al., 2020).

One of the potential weaknesses of our study, which could make it difficult to detect the supposed influence of economic education, is that we investigated a relatively narrow sample of respondents, i.e., the first- and second-year students only. Our decision not to invite third-year students came from a lack of microeconomic courses in the economics programme at the University of Lodz (UL), where our research was conducted. In the Polish higher education system, based on the Bologna Declaration, bachelor’s degree programmes are commonly taken over three years (the 3+2 system). Thus, we do not have seniors at the undergraduate level of university studies. We could have invited graduate students of economics instead; however, at the UL, many master’s degree students do not hold a bachelor’s degree in economics. Thus, their results could not be regarded as representative of a prolonged economic education.

Turning to previous research based on the PGG with voluntary contributions, our outcomes are within a spectrum of the most frequent results reported by other researchers. Typically, the average contributions are between 40% and 60% of the given initial endowments (Sally, 1995; Henrich et al., 2005). From this perspective, the mean donations by students of biology (64%) and mathematics (72%) should be acknowledged as exceptionally generous. This untypical generosity can be partially explained by the relatively low stakes settled in our narrative. The value of all the tokens was 10 PLN (approx. 2.2 EUR or 2.7 USD). A number of students referred to this in their comments when clarifying their donations. They revealed that contributing the maximum sum possible stemmed from regarding the initial endowment as small. One student even openly stated that if the amount had been higher, e.g. 100 PLN, he would have kept all the tokens for himself. However, the influence of stake levels on the strategies chosen by the participants of economic games has not yet been determined. Some studies claim that the level of the stakes matters (cf. van den Assem et al., 2012), while others deny their significance (cf. Henrich et al., 2005). To settle the question in a study like ours, one

would need to run the same experiment with economist and non-economist cohorts and with different levels of initial endowments. It opens a direction for further research.

Another uncommon result was related to the distribution patterns of donations. In PGG experiments run amongst university students, the typical distribution is U-shaped (bimodal), with modes at full contribution and zero donation (Henrich et al., 2005, p. 802). Neither the general sample nor any of our subgroups had such a distribution of donations. Surprisingly, the most popular split of the initial endowment was 50/50. Those students who decided to make that choice and who left comments explained that such a choice was a “fair split” or a relatively “safe” option, allowing them not to lose all the tokens while still contributing something to the common fund. Evidently, fairness and a pro-social attitude came into play. The sense of duty to donate something might have been strengthened by our narrative. The students made their decisions aware that they were “playing” with/against their colleagues from the same group. Regardless of keeping all the contributions confidential, some students must have developed a team spirit strong enough to make them donate a number of tokens to the common fund, aware they would be financially better off if they had not done so.

The detailed distribution of respondents’ contributions in PGGs was not discussed in previously published studies on the specifics of economics students. Hence, we are not able to assess whether the pattern of distribution we found in our sample constitutes an individual, highly untypical case or is representative of an untypical, Polish class of cases. We can, however, compare the average level of donations declared in our study and two earlier pieces of research, i.e., the canonical article by Maxwell and Ames (1981) and a recent study by Kaiser et al. (2018).² These studies’ findings are presented in Table 2.

The comparison reveals that the odd-one-out is not the present study but the one by Maxwell and Ames (1981). The mean donation by the economists participating in their experiment was more than twice lower than the averages reported in both Kaiser et al.’s (2018) research and ours. A similar gap was also observable with the non-economics majors. These differences could be explained by referring to differences in American and European cultures; however, we claim such an explanation would be misleading. Although Denmark and Poland are European countries, in terms of cultural proximity, the distance between Denmark and the U.S. seems to be smaller than between Denmark and Poland. Referring to Hofstede’s cultural dimensions, compared to both the U.S. and Denmark, Poland has considerably higher power distance, restraint, and uncertainty avoidance, while it has lower scores in individualism (Hofstede et al., 2010; cf. World Values Surveys Database).

Alternatively, one may turn to the four-decade time difference between Maxwell and Ames (1981) and the two newer studies pointing at significant changes in (micro)economics teaching that occurred between the 1980s and 2020s. This, we believe, could be an interesting line of argumentation emphasising, for instance, contributions by behavioural economics, which undermined the rational choice theory model of decision-making that was dominant in microeconomic textbooks in the second half of the 20th century. However, we must bear in mind that our study does not provide any evidence on the influence of economic teaching on students’ donations in the PGG. Maxwell and Ames (1981) tested neither the indoctrination nor the self-selection hypotheses, while Kaiser et al. (2018) found support for both. We may easily detect certain substantial changes in economic teaching between 1981 and 2018 but not between 2018 and 2021. All things considered, there is no basis for referring to changes in the

² No data about mean contributions were provided by Seguino et al. (1996). Two other PGG-based studies, i.e., Cadsby and Maynes (1998) and Altenmeyer-Bartscher et al. (2017) were sequential, thus incompatible to ours. Moreover, both teams of researchers implemented a threshold, which was not set up in our study. In turn, Ifcher and Zarghamee (2018), who also analysed the PGG, were interested in detecting a brief effect of exposition on the economic content, not a regular economic education.

content of economics textbooks as a credible factor that results in the inconsistency of the outcomes of the older study and the two recent ones.

Table 2. Average contributions to the common fund in the PGG experiments (percentages rounded off to whole numbers)

Study by:	Year	N	Country	Economists [programmes specified]	Non-economists [programmes specified]
Maxwell and Ames	1981	64*	USA	20% [economics]	42% [not specified]
Kaiser, Pedersen and Koch	2018	1371	Denmark	44% [economics]	62% [business administration, marketing, management communication, public policy, political science, law, psychology, medicine]
				55% [economics, business administration, marketing, management communication]	64% [public policy, political science, law, psychology, medicine]
Dzionek- Kozłowska and Neneman	2022	286	Poland	47% [economics]	63% [administration, biology, social policy, mathematics]

* The comparison of the first (basic) and the twelfth experiments reported in the article by Maxwell and Ames (1981, 299-201, 306-307).

Source: Own elaboration based on data reported by Maxwell and Ames (1981), Kaiser, Pedersen, and Koch (2018), and empirical evidence gathered in the present experiment.

Another explanation is related to the specific rules of the PGG experiments employed in the three studies. In the Maxwell and Ames (1981) experiment, the multiplier grew with the growth of resources that were contributed to the common fund (from zero to 2.2). In Kaiser et al.'s (2018) study and the present study, the multipliers were fixed – settled at three and two, respectively. With the growing multiplier, the respondents might have thought that if they invested their tokens while the other players did not, the others would have benefited disproportionately from their contribution. Therefore, the propensity to free ride might have been stronger in the Maxwell and Ames (1981) experiment than in other research.

Finally, in contrast to numerous previous studies, we did not find any significant differences between contributions by males and females. Such differences were reported more frequently in the earlier papers (cf. Frank et al., 1993; Seguin et al., 1996; Whaples, 1995; Tse & Au, 1997; Frank & Schulze, 2000). The lack of a gender discrepancy in our sample might be read as an indirect sign of the gradual narrowing of the gap between social expectations and the socialisation of men and women. However, without more concrete evidence, such a claim would be a supposition only.

Conclusions

The present study confirmed that economists are different. Our empirical evidence demonstrates they are less willing to contribute to the common fund when there is a conflict between the individual and group interests than non-economics students. This inconsistency was observable among the first-year economics and non-economics students, which let us acknowledge it as an argument in favour of the self-selection hypothesis.

Despite employing a two-step procedure to capture the supposed effect of economic education on students' decisions about contributing to the common fund in the PGG experiment, we could not find any empirical evidence to support the indoctrination hypothesis. The economics majors we worked with decided to act against the rationale of economic theory. Their explanations revealed that values such as fairness and a team spirit, rather than economic gain, come into play. These findings allow us to argue that economic education does not have the power to erode students' moral and social norms and replace them with benefits maximisation as the only purpose.

The untypical distribution of donations, with the mode at the 50/50 split, was observable in both the economic and non-economic subgroups. Knowing that we were working with a sample of respondents of the same cultural and ethnic background, we might have regarded this anomaly as the outcome of certain culture-embedded factors. However, to justify such a conclusion, one should compare our findings with those of the same experiment run with different cultures and ethnicities. To improve our understanding of students' decisions in the PGG experiments and to clarify whether the level of the stakes matter, further research would be needed.

Finally, our study did not reveal any differences between males and females. This, in turn, could be treated as a sign of the gap between the socialisation of men and women being reduced.

Acknowledgement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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