

ORIGINAL ARTICLE

Are Business Students More Self-Interested Than Law Students? A Longitudinal Study

Cristina Miragaya-Casillas¹ | Raimundo Aguayo-Estremera² | Alberto Ruiz-Villaverde³ 

¹Department of Statistics and Operations Research, University of Granada, Spain | ²Department of Psychobiology and Methodology of Behavioral Sciences, Complutense University of Madrid, Spain | ³Department of Applied Economics, University of Granada, Spain

Correspondence: Alberto Ruiz-Villaverde (albertorv@ugr.es)

Received: 20 February 2024 | **Revised:** 28 January 2025 | **Accepted:** 10 March 2025

Funding: The authors would like to thank the research group SEJ-054: SWEEP: Studies on Wellbeing, Environment and Economic Policy (Plan Andaluz de Investigación, Desarrollo e Innovación) its financial support.

Keywords: indoctrination | microeconomics | other-interest | self-interest | self-selection

ABSTRACT

Substantial academic debate exists regarding whether students with economics training exhibit distinct behavioral patterns that differentiate them from students in other academic disciplines. On one hand, the debate remains open due to the heterogeneity of the results. On the other hand, establishing the reasons for these possible differences is complicated. The existing academic literature proposes two explanatory hypotheses: self-selection and indoctrination. Most of the current results support a self-selection effect and reject indoctrination. Despite this, most studies present methodological limitations that should be considered. This study aims to address and overcome these limitations. To enhance our understanding of the potential effects stemming from economic training, it contributes to the existing literature in three main ways: Firstly, it conducts a longitudinal study of self- and other-interested behavior in university students following a standard microeconomics course. Secondly, it employs a novel instrument to measure self- and other-interest, with strong psychometric properties of validity and reliability. Thirdly, the sample is limited to business and law students to ensure homogeneity in the comparison. Our results suggest the existence of behavioral differences, mainly due to the self-selection effect. No evidence was found to suggest an indoctrination effect from the study of microeconomics.

JEL Classification: A12, A13, A23, B21, D01

1 | Introduction

There is an ongoing academic debate about whether Econ students—defined as those studying economics-related courses, regardless of their specific major—tend to exhibit greater self-interest compared to non-Econ students. In economics, self-interest refers to individuals making choices that maximize their own benefit, satisfaction, or utility, forming a basis for many economic models to predict market behaviors and resource allocation. Unlike egoism, self-interest can align with societal welfare, as Adam Smith highlighted, since actions that benefit oneself can simultaneously contribute to the common good.

In a recent literature review, Miragaya-Casillas et al. (2023a) show us some of the complexities of this line of research. Firstly, research findings are heterogeneous. On the one hand, there is evidence to suggest that Econ students are more self-interested than non-Econ students (e.g., Bauman and Rose 2011; Beekun et al. 2017; Cappelen et al. 2015; Gerlach 2017; Petersen and Ford 2019). On the other hand, there is evidence to suggest that there are no behavioral differences between Econ and non-Econ students (e.g., Brosig et al. 2010; Dzionek-Kozłowska and Rehman 2017; Jamil et al. 2019). Contrary to expectations, there is also evidence to suggest that Econ students are more willing to cooperate

in social dilemmas than non-Econ students (e.g., Hu and Liu 2003; Yezer et al. 1996). Similarly, Van Dalen (2019) finds that economists, compared to the average citizen, exhibit a stronger orientation toward serving the public interest.

Secondly, academic literature that identifies various behavioral patterns in Economics students offers different explanations. This literature presents two explanatory hypotheses, namely self-selection and indoctrination. On the one hand, the *self-selection effect* suggests that Econ students are more self-interested than non-Econ students before starting their university studies (e.g., Carter and Irons 1991; Frank and Schulze 2000; Mertins and Warning 2014; Petersen and Ford 2019). On the other hand, the *indoctrination effect* suggests that exposure to economic training, grounded in the rational pursuit of self-interest, promotes this type of behavior in students. Proponents of this hypothesis argue that students become more self-interested after studying the theories and models of standard economics (e.g., Ahmed 2008; Delgado et al. 2020; Lopes et al. 2015). Additionally, there is evidence that supports both effects. A student who exhibits these behavioral patterns before beginning his or her university studies may also accentuate them after receiving economic training (e.g., Cipriani et al. 2008, 2009; Collin and Schmidt 2020; Espín et al. 2022; Spiegelman 2021; Tang and Robinson 2009).

In addition, Miragaya-Casillas et al. (2023a) present a series of methodological limitations of the literature. The most important ones to be considered are: first, self-interest is understood in a conceptually broad manner by researchers. Several authors relate self-interest directly to other variables, such as corruptibility or greed (Frank and Schulze 2000; Stanley and Tran 1998), or indirectly to cooperation, pro-social preferences, self-transcendence, or reciprocity (Ahmed 2008; Cox 1998; Dzionek-Kozłowska and Rehman 2017; James et al. 2001; Frey and Meier 2003; Meier and Frey 2004). Second, most studies use cross-sectional data, which poses challenges in inferring causal relationships. Few studies use longitudinal data (Bauman and Rose 2011; Frank et al. 1993; Frey and Meier 2003; Ifcher and Zarghamee 2018) because of the difficulty of collection, so more studies using this type of data are highly recommended. Third, the literature shows that most studies have been conducted with economics students, but business students have also been compared with students from other degrees. In this regard, two observations should be taken into account: (i) few studies (Collin and Schmidt 2020; Delgado et al. 2020; Espín et al. 2022) have tested the self-selection and indoctrination hypotheses with respect to business students' self-interested behavior; and (ii) when the students being compared belong to very disparate degrees, such as Economics and Nursing (Cox 1998; Lanteri and Rizzello 2014), one can logically expect behavioral differences between the two. However, when students belong to different degrees but share common features (e.g., they are part of the social sciences branch) and a notable distinction lies in the study of more advanced economics subjects like microeconomics, the opportunity to test and validate the self-selection and indoctrination hypotheses becomes more refined.

In view of the above, this study aims to address and overcome these limitations. To enhance our understanding of the potential

effects stemming from economic training, it contributes to the existing literature in three main ways: Firstly, it conducts a longitudinal study of self- and other-interested behavior in university students following a standard microeconomics course. Secondly, it employs a novel instrument to measure self- and other-interest, with strong psychometric properties of validity and reliability. Thirdly, the sample is limited to business and law students to ensure homogeneity in the comparison.

The remainder of this paper is organized as follows. Section 2 discusses the conceptual framework and formulates the hypotheses of this research. Section 3 describes the methodological aspects. Section 4 presents the results. Finally, section 5 discusses the results and concludes the study.

2 | Conceptual Framework and Hypotheses

2.1 | Self-Interest and Standard Microeconomics

To comprehend the power that self-interest currently wields in human actions, one must delve into the contributions of philosophers from the 17th and 18th centuries. Hirschman (1997) explains that pre-capitalist aristocratic ideals largely rejected profit-seeking activities. Over time, however, the “rationally conducted acquisition of wealth” came to be seen as a “calm passion,” signaling a shift toward viewing disciplined passions as beneficial for the common good. This ideological and moral transformation was essential for the rise of capitalism, as individuals turned from being driven by “indomitable” passions to pursuing structured self-interests. Unlike erratic passions, the predictability of interest-driven actions promoted social order. Whereas the “love of gain” was seen as “universal” and “perpetual,” other passions like envy or revenge operated sporadically and targeted specific individuals. The pursuit of self-interest began to be appreciated for its ability to unite people as part of a social fabric based on mutual need.

This approach reached its zenith of popularity with Adam Smith and his metaphor of the invisible hand (Smith 1776/1994), precisely when the central elements of the modern economy began to take shape. Although the moral psychology developed by Adam Smith is complex and extensive,¹ especially when considering his work “The Theory of Moral Sentiments,” economists have simplified and assimilated his thought as follows: humans are self-interested due to essentially positive natural impulses aimed at creating order in the world. Building on this philosophical foundation, Smith constructs a compelling argument that an individual's self-interest contributes to society's best interests. Competition regulates prices, production costs, profits, and interest rates, preventing the abuses of monopolies. The key element of Smith's argument is that individual self-interest, operating through the market system, produces the greatest possible good for the nation as a whole. In this calculation, there is no essential or inherent natural conflict between the individual's and society's best interests, as long as free individuals are educated and enlightened to act in rational ways (Wilk and Cliggett 2007, 53).

Over time, this philosophical thinking permeated the foundations of standard economics and is especially reflected in the principles of microeconomics. This is particularly visible in the

theory of consumer choice, theory of the firm, and general equilibrium theory. These theories form the core of microeconomics textbooks. This led us to limit the present research to studying the effects of an intermediate microeconomics course on business students. These students do not take advanced microeconomics or delve into other theories, such as game theory, as do the economics students.

2.2 | Self- And Other-Interest

Traditionally, researchers have centered their explanatory theories on self-interest as the predominant motivator of human behavior (e.g., Holmes et al. 2002; Ratner and Miller 2001). However, evidence accumulated by both economists and psychologists suggests that variables related to the pursuit of benefits for others hold significant explanatory power. For example, reciprocity and fairness are extensively studied in behavioral economics (e.g., Fehr and Schmidt 2006; Fehr and Falk 2003), similar to helping and prosocial behavior in social psychology (e.g., Dovidio 1984; Dovidio et al. 2017; Batson 1998; Penner et al. 2005), as well as altruism in both disciplines (e.g., Fehr and Fischbacher 2003; Piliavin and Charng 1990; Rachlin and Locey 2011; Schroeder et al. 1995).

Although self- and other-interest have been considered opposing constructs, there is research that show a mutually dependent relationship (Aguayo-Estremera et al. 2021; Gerbasi and Prentice 2013). For example, in a recent research Alós-Ferrer et al. (2022) show empirical evidence in relation to the fact that the same individuals can behave self-interestedly when interacting with a large group of people and, at the same time, show standard levels of prosocial behavior when there is only one other person.

This indicates that, contrary to the prevailing literature, human motivation related to self-interested behavior does not exclude the pursuit of other-interest. Moreover, it suggests that self- and other-interest can be conceptualized in a common theoretical framework that intends to explain human behavior in society. In this sense, Gerbasi and Prentice (2013) propose that self- and other-interest are different constructs related to each other but not necessarily in opposing directions. The modes in which self- and other-interest materialized in behavior seem to be similar. Both interests are regulated by a conscious and deliberative process in which personal needs, values, feelings, and aspirations play an important role in assessing the costs and benefits of individual behaviors. Following these authors, self-interest can be operationalized as “the pursuit of personal gains in socially valued domains, including material goods, social status, recognition, academic or occupational achievement, and happiness”. On the other hand, other-interest is defined as “the pursuit of gains for others in socially valued domains, including material goods, social status, recognition, academic or occupational achievement, and happiness”.

2.3 | Explanatory Hypotheses

As outlined in the introduction, two possible explanatory hypotheses exist in the literature when examining behavioral

differences between students. Firstly, the self-selection effect posits that Econ students are more self-interested than non-Econ students even before commencing their university studies (e.g., Carter and Irons 1991; Frank and Schulze 2000; Mertins and Warning 2014; Petersen and Ford 2019). In essence, this suggests that individuals who choose to study economics possess pre-existing traits that draw them to the discipline, rather than being influenced solely by educational experiences. Secondly, the indoctrination effect suggests that exposure to economic training, which emphasizes the rational pursuit of self-interest, fosters this type of behavior in students. Advocates of this hypothesis argue that students become more self-interested after studying the theories and models of standard economics (e.g., Ahmed 2008; Delgado et al. 2020; Lopes et al. 2015).

According to the above, the following hypotheses will be tested:

Hypothesis 1. *Self-selection: Business students have higher self-interest scores compared to law students prior to beginning their university studies.*

Hypothesis 2. *Indoctrination: The difference in scores between business and law students will be higher in self-interest, once they have completed the microeconomics course, in favor of the former.*

Two specific conditions were presented to test Hypothesis 2.

Condition 1. Intergroup comparison (treated vs. untreated): Business students obtain higher self-interest scores than law students once the former have completed the microeconomics course.

Condition 2. Intragroup comparison (pretest vs. posttest): Business students obtain higher self-interest scores after completing the microeconomics course.

3 | Materials and Methods

3.1 | Research Design

A pretest-posttest design (or repeated-measure longitudinal design) is proposed to fulfill our purpose. This type of design makes it possible to assess the same participants at two different points in time: an initial (pre) measurement and a subsequent (post) measurement, typically following a treatment. These designs are common in disciplines such as social sciences, psychology, education, and medicine, as they allow researchers to observe changes in the variables of interest and evaluate the impact of the treatment. The primary advantage of these studies is their ability to track changes over time within the same individuals (Seifert et al. 2010).

The academic year in Spanish universities runs from the end of September to the end of June. The first semester spans from September/October to January/February, with January and February designated as the evaluation period. The second semester runs from February to June, with June and July as the corresponding evaluation period.

For our specific design, the treatment consists of taking the microeconomics course (2nd semester). Consequently, a (pre) self-interest measurement was conducted in February 2019 at the beginning of the microeconomics course, followed by a (post) measurement in May 2019 at the end of the microeconomics course. This study was then replicated in the subsequent academic year.

3.2 | Instrument

As mentioned above, Gerbasi and Prentice (2013) developed a two-dimensional theoretical model that challenges the tendency to view self-interest as the sole explanatory factor for human behavior. Based on this model, they created the Self- and Other-Interest Inventory (SOII), which measures two distinct but related constructs: self- and other-interest.

The SOII was designed to assess these constructs in both adults and college students in the U.S. This inventory has three main advantages over other measurement tools (Aguayo-Estremera et al. 2021): (i) it demonstrates strong psychometric properties for validity and reliability: the Exploratory Factor Analysis (EFA) showed acceptable fit indices (RMSEA = 0.087, RSMR = 0.09, GFI = 0.935) and good reliability, with Cronbach's alpha of 0.72 for self-interest and 0.78 for other-interest; (ii) it does not assume a specific relationship between self- and other-interest; and (iii) it does not consider self-interest to be the sole central factor in explaining behavior.

For this research, we used the student-adapted version of the SOII for Spain, developed by Aguayo-Estremera et al. (2021). This adaptation maintains the original 2-factor structure of the original inventory; however, it introduces certain differences from the original version, such as the removal of the neutral option on the response scale (4 = "Neither agree nor disagree"), which often leads to response clustering and can impact the reliability and internal structure of the test. The adapted SOII consists of 18 items, half of which measure self-interest and the other half, other-interest. Respondents indicate their level of agreement with each item using a six-point Likert scale (1 = Strongly disagree; 6 = Strongly agree). The inventory can be found in Appendix 1.

3.3 | Study Variables

The dependent variables are *SELF-INTEREST* and *OTHER-INTEREST*. Both variables assess the level of agreement with

pursuing personal gains or gains for others, respectively, in socially valued areas such as material goods, social status, recognition, academic or occupational success, and happiness.

The independent variables are grouped as follows. First, we have the academic variables: *GROUP*, which distinguishes between business and law students; and *PRIORECO*, which indicates whether the student received prior training in economics before starting their university studies. Second, we have the socioeconomic variables: *WORK*, which indicates whether the student is currently employed; *SCHOLARSHIP*, which shows whether the student has received a scholarship for university studies; *FAMILY INCOME*, the student's average family income; *MALE*, the student's gender; and *AGE*, the student's age. Third, we have a personality variable, *PROSOCIALITY*, which measures traits such as altruism, kindness, and trust, related to the frequency of prosocial behaviors exhibited by the student (Caprara and Pastorelli 1993). Table 1 below provides a summarized description of the variables used in the study. Their assigned values are specified to facilitate a clearer interpretation of their categorization within the analysis.

3.4 | Participants

A total of 498 first-year university students from the University of Granada (Spain) participated in the study. As mentioned above in the research design (see Table 2), participants were divided into two groups: a treated group (business students), an untreated group (law students) with the study of microeconomics considered as the treatment. Rosengart et al. (2020) explored behavioral differences between business and law students. They justified their participant selection, noting that law students develop problem-solving skills for balancing competing interests and making fair judgments. Unlike law programs, business curricula usually lack mandatory ethics courses. Microeconomics textbooks aim to cultivate economic intuition and promote the mindset of "thinking like an economist" (Frank 2013, 7).

It is worthwhile to note that both groups had to be as homogeneous and comparable as possible. First, all students were selected based on the similarity of their sociodemographic and personality characteristics. Table 3 presents the number of participants by group and academic year, along with their descriptive statistics: the mean and their standard deviations in parentheses. Appendix 2 also includes homogeneity analyses by group for each variable.

TABLE 1 | Research design.

Groups	Study academic year 2018–2019			Replication academic year 2019–2020		
	February 2019	X	May 2019	February 2020	X	May 2020
Treated group	O _{Pretest}	X	O _{Posttest}			
Untreated group	O _{Pretest}	—	O _{Posttest}			
Treated group				O _{Pretest}	X	O _{Posttest}
Untreated group				O _{Pretest}	—	O _{Posttest}

Note: X = Treatment (taking a microeconomics course); O = Observation; Pretest = The first data collection with the students was performed at the beginning of the microeconomics course; Posttest = The second collection was performed with the same groups of students at the end of the microeconomics course. This data collection is replicated in the following academic year with new first-year students.

Secondly, students in both the treated and untreated groups completed an introductory economics course during the first semester, which contributed to the homogeneity and comparability of both groups. Any effect from this introductory course is assumed to have been consistent in magnitude across individuals. In addition, it is noteworthy that we controlled for students'

prior training in economics before starting their university studies (*PRIORECO*). To verify the comparability of the groups regarding this factor, the assumptions of normality (Shapiro–Wilk normality test), homogeneity (Bartlett test of homogeneity), and independence (Welch Two Sample t-test) of scores were tested for both academic years (see Table 4). For all tests, the *p*-values

TABLE 2 | Description of study variables.

Variables	Description
Dependent variables	
<i>SELF-INTEREST</i>	Degree of agreement regarding the pursuit of personal gain (1 = Completely disagree; 6 = Completely agree).
<i>OTHER-INTEREST</i>	Degree of agreement regarding the pursuit the gain for others (1 = Completely disagree; 6 = Completely agree).
Independent variables	
Academic variables	
<i>GROUP</i>	Coded as 1 if the respondent is a business student, 0 if the respondent is a law student.
<i>PRIORECO</i>	Coded as 1 if the respondent has received previous training in economics before university, 0 otherwise.
Socioeconomic variables	
<i>WORK</i>	Coded as 1 if the respondent is employed, and 0 otherwise.
<i>SCHOLARSHIP</i>	Coded as 1 if the respondent has received a scholarship for their university studies, and 0 otherwise.
<i>FAMILY INCOME</i>	Net monthly family income (1 less than 800 €/month, 2 between 800 and 1600 €/month, 3 between 1600 and 2400 €/month, 4 more than 2400 €/month).
<i>MALE</i>	Coded as 1 if the respondent is male, and 0 if the respondent is female.
<i>AGE</i>	Age of the respondent.
Personality	
<i>PROSOCIALITY</i>	Traits such as altruism, kindness, and trust, related to the frequency of prosocial behaviors (0 never, 1 sometimes, 2 often).

TABLE 3 | Descriptive statistics of study variables.

Variable	Study academic year 2018–19 (<i>N</i> = 197)	Replication academic year 2019–20 (<i>N</i> = 301)		
	Treated \bar{x} (<i>SD</i>)	Untreated \bar{x} (<i>SD</i>)	Treated \bar{x} (<i>SD</i>)	Untreated \bar{x} (<i>SD</i>)
Academic variables				
<i>PRIORECO</i>	0.672 (0.47)	0.554 (0.50)	0.680 (0.50)	0.574 (0.47)
Socioeconomic variables				
<i>WORK</i>	0.224 (0.41)	0.231 (0.43)	0.357 (0.43)	0.241(0.48)
<i>SCHOLARSHIP</i>	0.455 (0.50)	0.481 (0.50)	0.429 (0.50)	0.459 (0.50)
<i>FAMILY INCOME</i>	2.703 (0.93)	2.697 (0.98)	3.044 (0.94)	2.905 (0.93)
<i>MALE</i>	0.418 (0.50)	0.496 (0.50)	0.468 (0.50)	0.495 (0.50)
<i>AGE</i>	18.612 (1.16)	18.853 (1.33)	18.656 (1.21)	18.759 (1.17)
Personality				
<i>PROSOCIALITY</i>	1.672 (0.19)	1.523 (0.29)	1.484 (0.42)	1.596 (0.34)

exceed the common threshold of 0.05. This indicates that: the null hypothesis of normality is not rejected, meaning the data follow a normal distribution in both groups; the null hypothesis of homogeneity is not rejected, suggesting that the variances between the groups are not significantly different, and that the groups have similar variances (homogeneity); and the null hypothesis of independence is not rejected, implying that there is no significant correlation between the variables of the groups under study.

In summary, the results show that, in terms of normality, homogeneity, and independence, the groups in both academic years are comparable. These results are important for evaluating the self-selection hypothesis without introducing potential biases between the groups, such as prior indoctrination during high school education (Bauman and Rose 2011; Carter and Irons 1991; Miragaya-Casillas et al. 2023b).

Finally, the following strategy was developed with two main purposes: first, to maximize the homogeneity and comparability between groups; and second, to isolate the effects of microeconomics as a treatment. Specifically, participants with a self-interest score above 80% of the total (i.e., more than 44 points) in the first data collection were excluded from the sample. This approach reduces variability in initial self-interest levels, allowing for a more precise isolation of the treatment effect of the microeconomics course. As a result, it contributes to a more accurate evaluation of the indoctrination hypothesis.

3.5 | Procedure

The pre-test was administered in the first week of the beginning of the microeconomics course, and the post-test was administered to the same groups of students in the last weeks before the end of the microeconomics course.

The process was identical in both academic years—the year of the study and the year of its replication. First, students were invited to participate in the study by a questionnaire administrator. A brief explanation of the research was provided to the participants, who were informed that the questionnaire had been previously approved by the University Ethics Committee. For this reason, they were asked for consent and were informed of the voluntary and anonymous nature of the study. Second, the students answered the questionnaire, which

lasted for approximately 8 min. Students were encouraged to participate in both the pre- and post-tests. As the questionnaire was anonymous, the responses to the two tests were identified using the identification code generated by the participants. Only students who participated in both tests entered a drawing for a €50 voucher.

All students in the treated group took the same microeconomics course at the same university. The teaching guide was the same for all students, with the same contents (The Basics of Supply and Demand; Producers, Consumers, and Competitive Markets; Market Structure; and General Equilibrium), the same reference textbook (Pindyck and Rubinfeld 2013, 8th edition); same methodology (theory and practice), and same evaluation.

4 | Results

Sensitivity analyses were performed to consider the effect of outliers in all data analyses. A confidence level of 0.95 and a power of 0.8 were set for all statistical analyses. To control the effect of outliers, no statistically significant differences were found.

4.1 | Hypothesis 1. Self-Selection

The self-selection hypothesis holds that business students obtain higher scores in self-interest than law students prior to beginning their university studies. To test this hypothesis, an ordered logistic regression was performed to observe whether there were differences in self- and other-interest between the untreated and treated groups. Consequently, the dependent variables included in the regression were *SELF-INTEREST* and *OTHER-INTEREST* which represent the scores obtained by the students in self and other-interest respectively.

In the 2018–19 academic year, the pretest scores for self-interest were 32.6 for the untreated group and 34.307 for the treated group. In the 2019–20 replication, the self-interest scores were 32.833 for the untreated group and 34.829 for the treated group. For other-interest, the pretest means were 33.692 for the untreated group and 33.823 for the treated group in the 2018–19 academic year. In the 2019–20 replication, the pretest means were 32.812 for the untreated group and 33.994 for the treated group.

These descriptive statistics reveal initial differences between the groups, with Business students showing a favorable outcome. Additionally, the results of the ordered logistic regression analysis presented in Table 5 complement these findings. The table includes the coefficient values, Z-statistics (in parentheses), and their respective significance levels.

In both the 2018–19 and 2019–20 academic years, statistically significant differences were observed between the treated and untreated groups in self-interest prior to studying the microeconomics course. According to the odds ratios obtained for statistically significant variables, students in the treated group (*GROUP*) were 1.957 times (in the 2018–19 academic year) and 1.853 times (in the 2019–20 academic year) more likely to obtain higher self-interest scores than those in the untreated group,

TABLE 4 | Normality, homogeneity, and independence of *PRIORECO*.

	Study academic year 2018–19	Replication academic year 2019–20
Normality	W = 0.592 p = 0.236	W = 0.629 p = 0.220
Homogeneity	$\chi^2(1) = 0.243$ p = 0.622	$\chi^2(1) = 0.384$ p = 0.535
Independence	t (139.85) = 1.625 p = 0.107	t (268.72) = 1.809 p = 0.072

TABLE 5 | Ordered logistic regression analysis.

Variable	Academic year 2018–19		Academic year 2019–20	
	Self-interest	Other-interest	Self-interest	Other-interest
Academic variables				
<i>GROUP</i>	0.672*** (2.38)	−0.120 (−0.416)	0.617*** (2.698)	0.120 (0.522)
<i>PRIORECO</i>	0.156 (0.581)	0.001 (0.004)	−0.035 (−0.156)	−0.018 (−0.079)
Socioeconomic variables				
<i>WORK</i>	0.153 (0.492)	−0.162 (−0.525)	0.202 (0.828)	0.034 (0.139)
<i>SCHOLARSHIP</i>	0.012 (0.044)	−0.119 (−0.405)	0.297 (1.282)	−0.027 (−0.115)
<i>FAMILY INCOME</i>				
2	1.315*** (2.548)	−0.08 (−0.154)	−0.881 (−1.791)	−0.318 (−0.69)
3	1.946*** (3.406)	0.204 (0.357)	−0.39 (0.906)	0.273 (0.692)
4	1.783*** (3.144)	−0.259 (−0.454)	−0.293 (−0.649)	0.099 (0.24)
<i>MALE</i>	0.565 (1.998)	0.285 (0.998)	0.173 (0.766)	0.141 (0.615)
Personality				
<i>PROSOCIALITY</i>				
1	1.77 (1.395)	4.567*** (0.007)	—	—
2	1.481 (1.208)	6.293*** (3.732)	−0.48 (0.156)	1.242** (3.965)
Observations	197	197	301	301
Log likelihood	−554.33	−580.50	−796.3	−821.63
LR X ² (<i>p</i> -value)	30.708 (0.000)	32.289 (0.000)	18.62 (0.028)	20.648 (0.014)

Note: ***, **, * Statistically significant at 0.01 (99% confidence level), at 0.05 (95% confidence level) and at 0.1 (90% confidence level), respectively.

keeping all other variables constant. It is worth noting that the effect sizes were moderate in both academic years. Therefore, the self-selection hypothesis was supported for both academic years. No significant differences in other-interest were observed between the two groups in either academic year.

Additionally, the higher *Income* categories (levels 2, 3, and 4) exhibit positive and significant coefficients exclusively in the 2018–19 academic year. This finding suggests that, based on the estimated odds ratios, students from families with higher incomes are 3.723, 6.997, and 5.945 times more likely, respectively for each income level, to achieve higher self-interest scores, while holding all other variables in the model constant. This result suggests that greater access to resources and opportunities promotes individual success, reinforcing a mindset centered on personal achievement. Together, these factors indicate that

a family environment with more economic resources supports the development of a more individualistic approach in students.

With respect to other-interest, higher levels of the *PROSOCIALITY* variable (altruism, kindness, and trust) show significant and positive coefficients in both academic years. Based on the estimated odds ratios, the likelihood of obtaining higher scores in other-interest was 5.317 times greater in the 2018–19 academic year and 3.462 times greater in the 2019–20 academic year when achieving higher scores in the *PROSOCIALITY* variable, while holding all other variables constant.

Finally, the overall indicators of model fit for both academic years show significant values, confirming that the sets of independent variables have a meaningful impact on the dependent variables.

4.2 | Hypothesis 2. Indoctrination

The indoctrination hypothesis holds that the differences in scores between business and law students will be higher in self-interest upon the completion of the microeconomics course, in favor of the former.

During the 2018–19 academic year, the posttest scores for self-interest were 33.286 for the untreated group and 33.587 for the treated group. In the 2019–20 replication, the self-interest scores were 35.375 for the untreated group and 34.692 for the treated group. For other-interest, the posttest means were 33.123 for the untreated group and 32.24 for the treated group in the 2018–19 academic year. In the 2019–20 replication, the posttest means were 33.824 for the untreated group and 35.926 for the treated group.

To test this hypothesis, a 2×2 mixed ANOVA was performed. As the data are longitudinal in nature, it is necessary to use alternative models to linear regressions, such as linear mixed models, which estimate both the expected values of the observations (fixed effects), and the variances and covariances of the observations (random effects). The results are shown in Table 6.

Condition 1. Intergroup comparison (treated vs. untreated). There were no significant differences in self-interest between the two groups in any academic year.

Condition 2. Intragroup (pretest vs. posttest). There were no significant differences in self-interest between the two groups in any academic year. Only the results for the 2019–2020 academic year were statistically significant in other-interest. Specifically, business students obtained lower scores in other-interest in the posttest compared to the pretest.

Overall, Hypothesis 2 would not be fulfilled for any academic year. It should be noted that the effect sizes are moderate in both academic years.

5 | Discussion

Currently, scholars from different fields of knowledge are trying to obtain answers as to whether Econ students (in general terms) are more self-interested than non-Econ students. The academic literature shows mixed results and faces several methodological limitations. First, self-interest is often broadly defined and connected either directly to variables such as

egoism and greed or indirectly to concepts like cooperation and reciprocity. Second, while most studies depend on cross-sectional data, which restricts causal inference, longitudinal studies—although less common—are generally preferred. Third, research has primarily focused on comparing economics students with those from unrelated fields, making it difficult to isolate specific causal factors due to the expected general differences.

Prior research generally explores two explanatory hypotheses to explain the potential differences between Econ and non-Econ students: self-selection and/or indoctrination. In the present research we have attempted to test these hypotheses by trying to overcome the conceptual and methodological limitations existing in the academic literature. Firstly, a longitudinal design was used with intergroup and intragroup comparisons to correctly determine the causal relationship of the hypotheses. The study was conducted over two academic years, featuring a substantial sample size. When testing the self-selection hypothesis, students' prior training in economics was controlled, which enabled us to observe whether indoctrination might have occurred during high school education. To test the indoctrination hypothesis, two rounds of data collection were conducted: one prior to the commencement of a microeconomics course and another at the course's conclusion to assess potential indoctrination effects. To isolate the effects of the microeconomics course, participants with very high initial self-interest scores were excluded from the sample. This approach reduces variability in self-interest levels at the outset, enabling a clearer assessment of the treatment's impact and providing a more accurate evaluation of the indoctrination hypothesis. Instruments that explicitly referenced economic theories were intentionally avoided to mitigate potential learning effects. The SOII, a psychometrically robust instrument, was used to measure self- and other-interest in university students. Finally, the sample was restricted to business and law students to maintain homogeneity in the comparison. Additionally, various sociodemographic and personality variables were controlled to ensure homogeneity between the study groups.

In our study, certain noteworthy results emerge. First, in examining the self-selection hypothesis: while we controlled for the prior economic background of all students, there was no discernible evidence of a preceding effect, either in *Self-interest* or in *Other-interest*. However, when comparing business and law students from the same university, we identified evidence of a self-selection effect in both academic years. At the beginning of the course, business students exhibited higher levels of self-interest. This finding aligns with the results of Rosengart

TABLE 6 | 2×2 mixed ANOVA analysis.

Academic year	Condition 1 treated vs. untreated			Condition 2 pretest–posttest				
	Self-interest		Other-interest	Self-interest			Other-interest	
	F	p	F	p	F	p	F	p
2018–2019	0.580	0.563	−0.807	0.421	−1.657	0.100	−2.858	0.005**
2019–20	−0.656	0.516	0.706	0.484	0.070	0.945	0.047	0.963

Note: ***, **, * Statistically significant at 0.01 (99% confidence level), at 0.05 (95% confidence level) and at 0.1 (90% confidence level), respectively.

et al. (2020). These authors also compared business and law students, though their study was cross-sectional, whereas ours is longitudinal. Despite this difference, they found that business students self-select and make decisions based on efficiency and profit-maximization criteria, whereas law students base their decisions more on social criteria. Second, no evidence was found to support an indoctrination effect from studying microeconomics. However, the results for the 2019–2020 academic year showed a statistically significant difference in other-interest. Specifically, business students scored lower on the posttest compared to the pretest regarding other-interest.

In summary, our findings suggest that the above results on self-interest are in line with the conclusions obtained to date. Most articles that have tested both effects together support the self-selection effect and reject the indoctrination effect (Bauman and Rose 2011; Carter and Irons 1991; Frank and Schulze 2000; Frey et al. 1993; Frey and Meier 2003; Gandal et al. 2005; Krick et al. 2016; Lanteri and Rizzello 2014; McCannon 2014; Petersen et al. 2019).

The fact that many young people, focused on their own self-interest, choose to study careers in areas such as business highlights the importance of channeling that self-interest towards objectives that benefit both individuals and society. From an educational perspective, this implies the creation of incentives that encourage these students, the future economic and business leaders, to commit themselves to the common good. Thus, self-selection highlights the importance of an educational approach that not only responds to students' inclinations, but also broadens their social awareness, so that their future decisions contribute to fairer and more sustainable economic actions and policies. In Spain, it is notable that courses on business ethics and corporate social responsibility are available in only a small proportion of graduate programs and are almost entirely absent at the undergraduate level (Fernández and Sanjuán 2010). In this context, it is key to integrate ethical, sustainable, and social values into business academic programs. This will enable the training of future business professionals who balance private profit and economic efficiency with the social impact of their work.

One of the main limitations of our research is that it would be beneficial to consider a broader set of control variables related to students' personality traits and beliefs (e.g., attitudes towards welfare distribution, political interests, volunteering, etc.). These traits and beliefs develop over the formative years, with the family and school environment playing a significant role in shaping their development. Including these additional variables would undoubtedly enhance our understanding of the self-selection process among economics and business students.

Acknowledgments

The authors would like to thank the research group SEJ-054: SWEEP: Studies on wellbeing, environment and economic policy (Plan Andaluz de Investigación, Desarrollo e Innovación) its financial support.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

¹ Adam Smith's ideas go beyond the scope of modern economics, particularly in his nuanced distinction between the morally commendable aspect of understanding and promoting self-interest and the negative trait of selfishness. While self-interest and egoism are often used interchangeably, Smith argued that selfishness involves prioritizing one's needs at the expense of others, whereas self-interest simply entails taking care of oneself without harming others.

References

- Aguayo-Estremera, R., C. Miragaya-Casillas, M. Correa, and A. R. Villaverde. 2021. "Spanish Adaptation of the Self-and Other-Interest Inventory in Academic Settings." *Spanish Journal of Psychology* 24: 1–13. <https://doi.org/10.1017/SJP.2021.29>.
- Ahmed, A. 2008. "Can Education Affect Pro-Social Behavior?: Cops, Economists and Humanists in Social Dilemmas." *International Journal of Social Economics* 35: 298–307. <https://doi.org/10.1108/03068290810854565>.
- Alós-Ferrer, C., J. García-Segarra, and A. Ritschel. 2022. "Generous With Individuals and Selfish to the Masses." *Nature Human Behaviour* 6: 88–96. <https://doi.org/10.1038/s41562-021-01170-0>.
- Batson, C. D. 1998. "Altruism and Prosocial Behavior." In *The Handbook of Social Psychology*, edited by D. T. Gilbert, S. T. Fiske, and G. Lindzey, 4th ed., vol. 2, 282–316. McGraw-Hill.
- Bauman, Y., and E. Rose. 2011. "Selection or Indoctrination: Why Do Economics Students Donate Less Than the Rest?" *Journal of Economic Behavior and Organization* 79: 318–327. <https://doi.org/10.1016/j.jebo.2011.02.010>.
- Beekun, R. I., N. Alayoğlu, A. O. Öztürk, M. Babacan, and J. W. Westerman. 2017. "Gauging the Ethicality of Students in Turkish Institutions of Higher Education." *Journal of Business Ethics* 142: 185–197. <https://doi.org/10.1007/s10551-015-2779-x>.
- Brosig, J., T. Heinrich, T. Riechmann, R. Schöb, and J. Weimann. 2010. "Laying Off or Not? The Influence of Framing and Economics Education." *International Review of Economics Education* 9: 44–55. [https://doi.org/10.1016/S1477-3880\(15\)30061-X](https://doi.org/10.1016/S1477-3880(15)30061-X).
- Cappelen, A. W., K. Nygaard, E. Ø. Sørensen, and B. Tungodden. 2015. "Social Preferences in the Lab: A Comparison of Students and a Representative Population." *Scandinavian Journal of Economics* 117: 1306–1326. <https://doi.org/10.1111/sjoe.12114>.
- Caprara, G. V., and C. Pastorelli. 1993. "Early Emotional Instability, Prosocial Behaviour, and Aggression: Some Methodological Aspects." *European Journal of Personality* 7, no. 1: 19–36. <https://doi.org/10.1002/per.2410070103>.
- Carter, J. R., and M. D. Irons. 1991. "Are Economists Different, and If So, Why?" *Journal of Economic Perspectives* 5: 171–177. <https://doi.org/10.1257/jep.5.2.171>.
- Cipriani, G. P., D. Lubian, and A. Zago. 2008. "Money Illusion: Are Economists Different?" *Economics Bulletin* 1: 1–9.
- Cipriani, G. P., D. Lubian, and A. Zago. 2009. "Natural Born Economists?" *Journal of Economic Psychology* 30: 455–468.
- Collin, S. O. Y., and M. Schmidt. 2020. "Does Education Influence students' Moral Orientation?: A Survey of Business Students at a Swedish University." *Issues in Educational Research* 30: 35–57. <https://doi.org/10.3316/085748952356688>.

- Cox, S. R. 1998. "Are Business and Economics Students Taught to Be Non Cooperative." *Journal of Education for Business* 74: 69–74. <https://doi.org/10.1080/08832329809601664>.
- Delgado, C., M. Venkatesh, M. Castelo Branco, and T. Silva. 2020. "Ethics, Responsibility and Sustainability Orientation Among Economics and Management Masters' Students." *International Journal of Sustainability in Higher Education* 21: 181–199. <https://doi.org/10.1108/IJSHE-02-2019-0058>.
- Dovidio, J. F. 1984. "Helping Behavior and Altruism: An Empirical and Conceptual Overview." *Advances in Experimental Social Psychology* 17: 361–427. [https://doi.org/10.1016/S0065-2601\(08\)60123-9](https://doi.org/10.1016/S0065-2601(08)60123-9).
- Dovidio, J. F., J. A. Piliavin, D. A. Schroeder, and L. A. Penner. 2017. *The Social Psychology of Prosocial Behavior*. Psychology Press.
- Dzionek-Kozłowska, J., and S. N. Rehman. 2017. "Attitudes of Economics and Sociology Students Towards Cooperation: A Cross-Cultural Study." *Economics & Sociology* 10: 124–136. <https://doi.org/10.14254/2071-789X.2017/10-4/10>.
- Espín, A., M. Correa, and A. Ruiz-Villaverde. 2022. "Economics Students: Self-Selected in Preferences and Indoctrinated in Beliefs." *International Review of Economics Education* 39: 1–17. <https://doi.org/10.1016/j.iree.2021.100231>.
- Fehr, E., and A. Falk. 2003. "Reciprocal Fairness, Cooperation and Limits to Competition." In *Intersubjectivity in Economics*, 42–56. Routledge.
- Fehr, E., and U. Fischbacher. 2003. "The Nature of Human Altruism." *Nature* 425: 785–791.
- Fehr, E., and K. M. Schmidt. 2006. "The Economics of Fairness, Reciprocity and Altruism—Experimental Evidence and new Theories." In *Handbook of the Economics of Giving, Altruism and Reciprocity*, vol. 1, 615–691. Elsevier.
- Fernández, J. L. F., and A. B. Sanjuán. 2010. "The Presence of Business Ethics and CSR in Higher Education Curricula for Executives: The Case of Spain." *Journal of Business Ethics Education* 7: 25–38. <https://doi.org/10.5840/jbee201073>.
- Frank, B., and G. G. Schulze. 2000. "Does Economics Make Citizens Corrupt?" *Journal of Economic Behavior and Organization* 43: 101–113. [https://doi.org/10.1016/S0167-2681\(00\)00111-6](https://doi.org/10.1016/S0167-2681(00)00111-6).
- Frank, R., T. Gilovich, and D. T. Regan. 1993. "Does Studying Economics Inhibit Cooperation." *Journal of Economic Perspectives* 7: 159–171. <https://doi.org/10.1257/jep.7.2.159>.
- Frank, R. H. 2013. *Microeconomics and Behavior*. New York: McGraw Hill.
- Frey, B. S., and S. Meier. 2003. "Are Political Economists Selfish and Indoctrinated? Evidence From a Natural Experiment." *Economic Inquiry* 41: 448–462. <https://doi.org/10.1093/ei/cbg020>.
- Frey, B. S., W. W. Pommerehne, and B. Gygi. 1993. "Economics Indoctrination or Selection? Some Empirical Results." *Journal of Economic Education* 24: 271–281. <https://doi.org/10.1080/00220485.1993.10844799>.
- Gandal, N., S. Roccas, L. Sagiv, and A. Wrzesniewski. 2005. "Personal Value Priorities of Economists." *Human Relations* 58: 1227–1252.
- Gerbasi, M. E., and D. A. Prentice. 2013. "The Self-and Other-Interest Inventory." *Journal of Personality and Social Psychology* 105: 495–514. <https://doi.org/10.1037/a0033483>.
- Gerlach, P. 2017. "The Games Economists Play: Why Economics Students Behave More Selfishly Than Other Students." *PLoS ONE* 12: 1–17. <https://doi.org/10.1371/journal.pone.0183814>.
- Hirschman, A. O. 1997. *The Passions and the Interests: Political Arguments for Capitalism Before Its Triumph*. Chichester, WS: Princeton University Press. <https://doi.org/10.3138/cjh.12.3.409>.
- Holmes, J. G., D. T. Miller, and M. J. Lerner. 2002. "Committing Altruism Under the Cloak of Self-Interest: The Exchange Fiction." *Journal of Experimental Social Psychology* 38: 144–151. <https://doi.org/10.1006/jesp.2001.1494>.
- Hu, Y. A., and D. Y. Liu. 2003. "Altruism Versus Egoism in Human Behavior of Mixed Motives: An Experimental Study." *American Journal of Economics and Sociology* 62: 677–705. <https://doi.org/10.1111/1536-7150.00240>.
- Ifcher, J., and H. Zarghamee. 2018. "The Rapid Evolution of homo Economicus: Brief Exposure to Neoclassical Assumptions Increases Self-Interested Behavior." *Journal of Behavioral and Experimental Economics* 75: 55–65. <https://doi.org/10.1016/j.socec.2018.04.012>.
- James, T., L. Soroka, and J. G. Benjafield. 2001. "Are Economists Rational, or Just Different?" *Social Behavior and Personality: An International Journal* 29: 359–364. <https://doi.org/10.2224/sbp.2001.29.4.359>.
- Jamil, R., J. Mohammad, and M. Ramu. 2019. "Antecedents of Unethical Behaviour Intention: Empirical Study in Public Universities in Malaysian Context." *Journal of Academic Ethics* 17: 95–110. <https://doi.org/10.1007/s10805-018-9312-7>.
- Krick, A., S. Tresp, M. Vatter, A. Ludwig, and M. Wihlenda. 2016. "The Relationships Between the Dark Triad, the Moral Judgment Level, and the students' Disciplinary Choice." *Journal of Individual Differences* 37: 24–30. <https://doi.org/10.1027/1614-0001/a000184>.
- Lanteri, A., and A. Rizzello. 2014. "Ought (Only) Economists to Defect? Stereotypes, Identity, and the prisoner's Dilemma." In *The Economics of Economists: Institutional Setting, Individual Incentives, and Future Prospects*, edited by A. Lanteri and J. Vromen, 316–343. Cambridge: Cambridge University Press.
- Lopes, J. C., J. C. Graça, and R. G. Correia. 2015. "Effects of Economic Education on Social and Political Values, Beliefs and Attitudes: Results From a Survey in Portugal." *Procedia Economics and Finance* 30: 468–475. [https://doi.org/10.1016/S2212-5671\(15\)01314-3](https://doi.org/10.1016/S2212-5671(15)01314-3).
- McCannon, B. C. 2014. "Do Economists Play Well With Others? Experimental Evidence on the Relationship Between Economics Education and pro-Social Behavior." *American Economist* 59: 27–33.
- Meier, S., and B. S. Frey. 2004. "Do Business Students Make Good Citizens." *International Journal of the Economics of Business* 11: 141–163. <https://doi.org/10.1080/1357151042000222492>.
- Mertins, V., and S. Warning. 2014. "Greedy and Selfish? Differences in Fairness Preferences of Prospective Lawyers and Managers." *German Journal of Human Resource Management* 28: 410–431. <https://doi.org/10.1688/ZfP-2014-04>.
- Miragaya-Casillas, C., R. Aguayo-Estremera, and A. Ruiz-Villaverde. 2023a. "University Students, Economics Education, and Self-Interest. A Systematic Literature Review." *International Review of Economics Education* 43: 1–13. <https://doi.org/10.1016/j.iree.2023.100266>.
- Miragaya-Casillas, C., R. Aguayo-Estremera, and A. Ruiz-Villaverde. 2023b. "Self-Selection or Indoctrination in the Study of (Standard) Economics: A Systematic Literature Review." *Theory and Research in Education* 21: 176–196. <https://doi.org/10.1177/1477878523117824>.
- Penner, L. A., J. F. Dovidio, J. A. Piliavin, and D. A. Schroeder. 2005. "Prosocial Behavior: Multilevel Perspectives." *Annual Review of Psychology* 56: 365–392. <https://doi.org/10.1146/annurev.psych.56.091103.070141>.
- Petersen, B. K., and D. P. Ford. 2019. "Are Business Students Prepared for the World of Business? Self-Interest, Conformity and Conflict Styles." *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration* 36: 498–513. <https://doi.org/10.1002/cjas.1523>.
- Petersen, M., M. Keller, J. Weibler, and W. Hariskos. 2019. "Business Education: Does a Focus on Prosocial Values Increase students' pro-Social Behavior?" *Mind & Society* 18: 181–190. <https://doi.org/10.1007/s11299-019-00220-5>.

- Piliavin, J. A., and H. W. Charng. 1990. "Altruism: A Review of Recent Theory and Research." *Annual Review of Sociology* 16: 27–65.
- Pindyck, R., and D. Rubinfeld. 2013. *Microeconomics*. 8th ed. The Pearson Series in Economics. Prentice Hall.
- Rachlin, H., and M. Locey. 2011. "A Behavioral Analysis of Altruism." *Behavioural Processes* 87: 25–33.
- Ratner, R. K., and D. T. Miller. 2001. "The Norm of Self-Interest and Its Effects on Social Action." *Journal of Personality and Social Psychology* 81: 5–16. <https://doi.org/10.1037/0022-3514.81.1.5>.
- Rosengart, T., B. Hirsch, and C. Nitzl. 2020. "Self-Selection and Socialisation Effects of Business and Legal Studies." *Journal of Business Economics* 90: 1127–1145. <https://doi.org/10.1007/s11573-020-00973-3>.
- Schroeder, D. A., L. A. Penner, J. F. Dovidio, and J. A. Piliavin. 1995. *The Psychology of Helping and Altruism: Problems and Puzzles*. McGraw-Hill.
- Seifert, T. A., E. T. Pascarella, S. I. Erkel, and K. M. Goodman. 2010. "The Importance of Longitudinal Pretest-Posttest Designs in Estimating College Impact." *New Directions for Institutional Research* 2010, no. S2: 5–16.
- Smith, A. 1776/1994. *An Inquiry Into the Nature and Causes of the Wealth of Nations*. Modern Library.
- Spiegelman, E. 2021. "Embracing the Dark Side? Testing the Socialization of a Maximizing Mindset." *Economic Inquiry* 59: 740–761. <https://doi.org/10.1111/ecin.12958>.
- Stanley, T. D., and U. Tran. 1998. "Economics Students Need Not Be Greedy: Fairness and the Ultimatum Game." *Journal of Socio-Economics* 27: 657–663. [https://doi.org/10.1016/S1053-5357\(99\)80001-8](https://doi.org/10.1016/S1053-5357(99)80001-8).
- Tang, T., and T. Robinson. 2009. "The Ability of Economic Thinking – The 'Nature' Versus 'Nurture' Debate." In *Proceedings of the Quantitative Analysis of Teaching and Learning in Higher Education in Business, Economics and Commerce*, Melbourne, VIC, Australia. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1371303.
- Van Dalen, H. P. 2019. "Values of Economists Matter in the art and Science of Economics." *Kyklos* 72, no. 3: 472–499. <https://doi.org/10.1111/kykl.12208>.
- Wilk, R. R., and L. C. Cliggett. 2007. *Economies and Cultures: Foundations of Economic Anthropology*. 2nd ed. Westview.
- Yezer, A. M., R. S. Goldfarb, and P. J. Poppen. 1996. "Does Studying Economics Discourage Cooperation? Watch What We Do, Not What We say or how We Play." *Journal of Economic Perspectives* 10: 177–186.

Appendix 1

Spanish version of the Self- and Other-Interest Inventory (SOII)

1	2	3	4	5	6		
Completely disagree	Strongly disagree	Somewhat disagree	Somewhat agreement	Strongly agreement	Completely agree		
I look for ways to make my friends earn more money		1	2	3	4	5	6
Making a lot of money is one of my objectives in life.		1	2	3	4	5	6
I look for opportunities to help people who I know to improve their social status.		1	2	3	4	5	6
Getting good grades is near the top of my priorities in the university.		1	2	3	4	5	6
I want my classmates to praise me.		1	2	3	4	5	6
I am constantly looking out for what makes me happy.		1	2	3	4	5	6
I always find the way to make the people who I know stand out from others.		1	2	3	4	5	6
I look for opportunities to gain social status.		1	2	3	4	5	6
I try to ensure that my classmates know about my successes.		1	2	3	4	5	6
I help the classmates I know do well in their studies.		1	2	3	4	5	6
I try to help my classmates by talking about their successes.		1	2	3	4	5	6
I am always looking for ways to stand out from others.		1	2	3	4	5	6
I look for my own interests.		1	2	3	4	5	6
I help others to be happy.		1	2	3	4	5	6
I want others to praise my classmates.		1	2	3	4	5	6
One of my aims in life is to succeed.		1	2	3	4	5	6
I look out for other's interests.		1	2	3	4	5	6
Helping my friend to succeed is one of my objectives in life.		1	2	3	4	5	6

Appendix 2

and untreated groups

Results of the homogeneity test for variables between treated

Academic year	2018–19		2019–20	
	Untreated	Treated	Untreated	Treated
<i>PRIORECO</i>	$\chi^2(1) = 0.243; p = 0.622$		$\chi^2(1) = 0.480; p = 0.488$	
<i>WORK</i>	$\chi^2(1) = 0.004; p = 0.948$		$\chi^2(1) = 2.012; p = 0.156$	
<i>SCHOLARSHIP</i>	$\chi^2(1) = 0.001; p = 0.998$		$\chi^2(1) = 0.005; p = 0.944$	
<i>FAMILY INCOME</i>	$\chi^2(1) = 0.148; p = 0.701$		$\chi^2(1) = 0.017; p = 0.896$	
<i>MALE</i>	$\chi^2(1) = 0.009; p = 0.926$		$\chi^2(1) = 0.000; p = 0.994$	
<i>YEAR</i>	$\chi^2(1) = 1.423; p = 0.233$		$\chi^2(1) = 0.202; p = 0.653$	
<i>PROSOCIALITY</i>	$\chi^2(1) = 2.520; p = 0.112$		$\chi^2(1) = 1.781; p = 0.182$	