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# **Do business and economics studies erode prosocial values?**

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## Abstract

Does exposure to business and economics education make students less prosocial and more selfish? Employing a difference-in-difference strategy with panel-data from three subsequent cohorts of students enrolled in a Business and Economics bachelor's program (>900 students), we find that business and economics students become less prosocial over time relative to a control group of comparable students. Importantly, younger students appear to be significantly more malleable with respect to their to prosocial values. Furthermore, we observe heterogeneous effects across majors such as accounting, finance, and economics. Our research demonstrates a strong correlation between prosocial values and generous behavior.

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# I. Introduction

A substantial literature suggests that economics and business students behave less generous, are less cooperative, or in other ways exhibit less prosocial traits than their peers from other disciplines. If this is accurate, the reason may be that business and economics students are inherently different from other students. This self-selection hypothesis suggests that highly prosocial individuals, such as those with a higher degree of altruism, are less likely to choose business or economics as their field of study. Another hypothesis is that exposure to undergraduate business or economics, which often assumes individuals to be fully rational and self-interested, may lead students to become less prosocial and more selfish. This hypothesis goes by many names in the literature. It has been referred to as the “learning hypothesis” (Carter and Irons, 1991), an “indoctrination effect” (Frey and Meier, 2003), the “nurture hypothesis” (Haucap and Müller, 2014), a “moral debasing effect” (Etzioni, 2015) or simply “socialization” (Hellmich, 2019). While several papers have studied both these hypothesis, most studies have not been designed to disentangle the latter from the former and remain inconclusive on whether results are due to self-selection or indoctrination.

Methodologically, most previous research compares economic students to non-economic students within various experimental settings. Broadly, the approaches can be divided into three categories: (i) studies that use incentivized games and compare the behavior of economic versus non-economic students (see e.g., Marwell and Ames, 1981; Carter and Irons, 1991; Frank et al., 1993; Haucap and Müller, 2014; Ifcher and Zarghamee, 2018; Kaiser et al., 2018), (ii) studies that observe revealed behavior of economic versus non-economic students (see e.g., Frey and Meier, 2003, 2004; Bauman and Rose, 2011), or (iii) studies that investigate values or attitudes and how they compare between the student groups (see e.g., Frank et al., 1993; McCabe et al., 2006; Klein et al., 2007; Wang et al., 2011; Racko, 2019; Espín et al., 2022; Lameris et al., 2023). A few studies have focused on the somewhat related question on whether economics or business education influence political preferences (Fischer et al., 2017; Delis et al., 2019).

Some of these studies report results that aligns with the self-selection hypothesis; individuals who chose economics as field of study are less prosocial than their peers from other disciplines. For example, econ-students<sup>1</sup> have been shown to exhibit a higher degree of free-riding or lower degree of generosity in incentivized games (Marwell and Ames, 1981; Carter and Irons, 1991; Ifcher and Zarghamee, 2018; Kaiser et al., 2018), a higher degree of “corrupt” behavior (Frank and Schulze, 2000), and a higher degree of self-reported dishonesty (McCabe et al., 2006; Klein et al., 2007). A few studies report results that could be seen as consistent with the indoctrination hypothesis. These include variations in self-reported honesty (Frank et al., 1993), attitudes

towards ‘greed’ (Wang et al., 2011), and shifts in values related to power and hedonism (Racko, 2019). Still, some studies show mixed results or no effects at all (see e.g., Frey and Meier, 2003; Bauman and Rose, 2011; Girardi et al., 2023). As summarized in the literature review by Hellmich (2019), overall evidence are ambiguous.

In addition to Hellmich (2019), Miragaya-Casillas et al. (2023) and Etzioni (2015) also provide summaries of this literature. All three studies highlight consistent empirical, conceptual, and methodological challenges. They particularly underscore the issues with small sample sizes and the limitations in existing studies’ capacity to discern between self-selection and indoctrination. Consequently, these authors advocate that future studies should adopt longitudinal (panel data) approaches. The only previous study that, to our knowledge, utilize panel data in combination with modern identification strategies is Girardi et al. (2023). The authors study the effect of intermediate microeconomics on prosocial attitudes and behaviors in incentivized games ( $n=200$ ), and find that one semester of intermediate microeconomics have little effect on students prosocial behaviors or attitudes compared to a control group of students. While isolating the effect of one semester of intermediate microeconomics is interesting, this approach has some limitations, as also acknowledged by the authors. Importantly, studying the effect of intermediate economics could hide the effect on prosocial values of earlier economics courses.

Our study contribute to this literature in three ways. First, we utilize a unique panel dataset consisting of three cohorts of students from a large European business school. The dataset encompasses more than 900 individuals whom we tracked across six semesters (more than 2.5 years), from the initial weeks of their studies through to their final bachelor-level course preceding their thesis work. By comparing business and economics students to a control group of non-econ students over the same time frame, provide us with a rare opportunity to distinguish self-selection effects from possible indoctrination effects, on students’ prosocial values. Our results, in contrast to Girardi et al. (2023), indicate that there is indeed a significant indoctrination effect from business and economics education on prosocial values over the course of a full bachelor program. We assess students’ prosocial values based on the weight they assign to contributing to a better society in their future careers, as indicated by survey responses. To test the internal validity of the survey responses, we conduct an incentivized charity dictator game. We find that students’ self-reported prosociality significantly correlates with donations (generosity) in the game. Notably, at the time of enrollment, business and economics students do not differ from other students in terms of prosocial values. However, we do find evidence of self-selection related to values such as power and achievement (Schwartz, 1992). In our survey, these values are translated into aspirations for a high salary and a prestigious position

in a future career. These traits are more pronounced among business and economics students compared to the control group.

A second contribution of this paper is the investigation of how students' age at the time of enrollment impacts the effect of economics and business education on prosocial values. This aspect is notably understudied and many studies in this field neither include nor report age data (Miragaya-Casillas et al., 2023). Past longitudinal studies in psychology suggest that individuals' personal values tend to stabilize post-adolescence (Bardi et al., 2009; Vecchione et al., 2016). Of relevance for this study, Rekker et al. (2015) found that attitudes towards egalitarianism fluctuate until somewhere in the age range 18-20 and stabilize thereafter. This led the authors to conclude that young individuals might not form definitive perspectives on economic issues until they progress in their educational and professional pursuits. Additionally, university studies not only expose students to new ideas, but often also to new geographical and social environments. If younger students are more formative as suggested by the literature, one may expect older students to be less receptive or adaptable in this new environment compared to their younger peers. Our analysis supports this notion, indicating that the significant indoctrination effect related to business and economics education is solely attributable to students who are 20 years old or younger at the time of enrollment.

Our third contribution is that we are able to track the specific majors or specializations (e.g. economics, accounting, marketing, finance) chosen by the students within the business and economics program. These disciplines are built on diverse theoretical foundations, and while they all may lead to what Etzioni (2015) termed a 'moral debasing effect', it is far from obvious that the emphasis on homo economicus (a possible mechanism suggested in the literature) is the most "potent". For instance, the emphasis on stock returns in finance, discussions on tax avoidance strategies in accounting, or emphasis on concepts like agency theory or Porters "the five forces" mentioned by Ghoshal (2005) are other candidates. While we are unable to isolate the specific mechanisms, our analysis offers insights across majors. Our data suggest for example that students that end up majoring in finance (a choice made at the third semester), already at enrollment held less prosocial values than students in other specializations. We also find that while there seems to be an indoctrination effect on econ-majors, a much stronger effect is found for accounting majors.

The paper is organized as follows: In Section 2, we describe the survey design and background. Section 3 provides a first look at data and provides summary statistics and balance tests. The empirical strategy is presented in section 4, followed by the results in Section 5. Section 6 concludes.

## II. Survey design

This study is based on a panel dataset of over 900 students from a major European business school. These students are enrolled in one of three programs: business and economics, law, or environmental social science. The use of panel-data to study the effect on prosocial values from enrollment in business and economics education, constitutes a quite unique approach in this strand of literature (Hellmich, 2019; Miragaya-Casillas et al., 2023). Unlike prior research that predominantly depend on cross-sectional data, our study benefits from tracking the same students longitudinally throughout their education (from the initial weeks of their studies through to their final bachelor-level course preceding their thesis work). This data allows us to effectively disentangle potential selection effects from potential indoctrination effects.

The data was collected from 2016 to 2022, covering three cohorts of students enrolled in 2016, 2018, or 2019.<sup>2</sup> Each cohort was surveyed twice: once within weeks of enrolling in the program and subsequently at the beginning of their sixth semester, roughly 2.5 years later. Students pursued degrees in one of the following areas with the indicated approximate cohort sizes: (i) Business or Economics Major (n=240), (ii) Master of Law (n=210), and (iii) Environmental Social Science Major (n=35). We henceforth refer to these three programs as B&E, Law, and ESS, respectively, and we compare the B&E students to students in Law and ESS. Surveys were administered during the school’s sustainability theme days and included questions related to the seminars on these days, as well as questions about students’ expectations regarding their studies and future career aspirations. Data were collected in accordance with The European Data Protection Regulation (GDPR) and all students that chose to participate in the survey were informed that the data would be used for research.

The survey questions central to this study, which address students’ values and aspirations regarding their future professional roles, are informed by Schwartz fundamental values (Schwartz, 1992). The survey probes values such as power and achievement (assessed through self-reported preferences for high salaries or prestigious positions), and self-direction (valuing intellectually stimulating jobs). The survey also touches upon Schwartz values that are associated with security, tradition, or benevolence (as reflected in prioritizing roles compatible with family life) and stimulation (based on the emphasis students place on careers with extensive interpersonal interactions).

The core question of this paper, however, centers on how students perceive the importance of “contributing to a better society” in their future professional roles. This formulation aligns directly with the Schwartz value of universalism and serves as our conceptual measure (representation) of students’ prosocial values.

When constructing this survey item we refrained from using terms with potential political or warm glow bias, such as “good,” “fair,” or “just”. For a discussion on the warm the glow effect, see Andreoni (1990)). Additionally, we avoided attempting to define what constitutes a better society. Importantly, we validate this exact representation of student’s prosocial values by conducting an incentivized charity dictator game (further discussed in section 4.2).

The survey matrix allowed students to choose from four alternatives: not important, somewhat important, very important, or no opinion. In our main model specification, we use a binary variable to identify students with the strongest prosocial attitudes, coding “very important” as 1 and all other responses as 0. For robustness we also run models where we assign numerical values to this ordinal variable, that is we code “not important”=1, “somewhat important”=2 and “very important”=3. Students who responded “no opinion” were excluded from the ordered logit analysis (but are included in the main analysis).<sup>3</sup> The same set of questions was administered to students in the first and sixth semesters across all programs. Only students who responded to the questions on both occasions are included in the analysis. Note that summary statistics are presented in Table 1 and discussed further in the Results section.

### III. A first look at the data

Table 1 provides a summary of our data. The sample consists of a panel of 907 students, with an even distribution between control and treatment groups. The average response rate for each of the three cohorts is over 80%. We discuss potential effects related to attrition further below.

Table 1: Summary of Student Data

	<b>B&amp;E</b>	<b>Control</b>	<b>N Total</b>
Total number of students	454	453	907
Students in cohort 2016	152	146	298
Students in cohort 2018	150	131	281
Students in cohort 2019	151	177	328
Share of women	52%	67%	542
Share of men	48%	33%	365
Age (sd in brackets)	20.9 (2)	21.5 (3.3)	
Median age	20	20	
Share 20 years or older	53%	51%	

As can be seen in Table 2 B&E students differ from our control group in two respects, namely in relation to Schwartz values associated with achievement and power (the importance of prestige and the desire for a high salary). We find no significant differences between B&E students and the control concerning

universalism/prosocial values (contributing to a better society in a future career) or for any of the other values.

Table 2: Student values at enrollment

	<b>B&amp;E</b>	<b>Control</b>	<b>P-value diff (chi2)</b>
Prestige	58.0%	39.7%	0.000
Interacting with a lot of people	58.4%	53.2%	0.115
Obtaining a high salary	63.3%	38.9%	0.000
Contributing to a better society	60.7%	64.8%	0.207
Intellectually stimulating	67.7%	70.9%	0.270
Combining career with family life	69.3%	68.3%	0.869

Note: The table displays the percentage of students stating that a career trait is "very important" (binary measure) in a future career.

The control group consists mainly of Law students (399) but also of students studying Environmental Social Science (55 students). ESS students differ from Law and B&E students on one survey item: the importance assigned to contributing to a better society in a future career (ESS students are more prosocial at enrollment than both Law and B&E students)).

With regards to correlation between different career traits we find that "contributing to a better society", is positively correlated with "combining career with family life", "interaction with a lot of people" and with the career trait an "intellectually challenging job". We also find that "pay" and "prestige" are highly correlated. Additionally, high salary is uncorrelated with prosocial values (see Table A.5 in appendix). It seems as our career traits variables are reasonably consistent with the Schwartz value circle (Schwartz 1992) where adjacent values should be positively correlated (eg. power and achievement).

Table 3: Balance test, prosocial values at enrollment by cohort

	<b>B&amp;E</b>	<b>Control</b>	<b>p-value diff (chi2)</b>
Cohort 2016	63%	64%	0.736
Cohort 2018	57%	62%	0.444
Cohort 2019	62%	67%	0.346

Table 3 displays the per cohort percentages of students rating "contributing to a better society in a future career" as very important at the beginning of the first semester. While differences are not statistically significant, it can be seen how using a between-subject analysis could bias the estimators. Using, e.g., cohort 2018 as "freshmen" and cohort 2016 as "seniors" would bias the estimate towards a null effect using (57-63) compared to (62-64); in other words, one would find a four percentage point difference even if no students



changed their survey responses between the 1st to 6th semester. Comparing 2019 and 2018 could instead lead one to conclude that prosocial values generally decline over time but as seen above this biased approach would simply reflect the fact that cohorts were different at enrollment. So while cohort differences do not significantly differ it still highlights the value of the panel data and within-subject analysis.

To determine if students who dropped out between the first and sixth semesters differed from those who stayed in the program, we conducted a  $\chi^2$  test on a dropout dummy. This test showed no significant differences for any of the cohorts, leading us to conclude that prosocial values don't appear to influence students' decisions to drop out.

## IV. Empirical strategy

### A. Estimating the causal effect of B&E education on prosocial values

#### 1. McNemar test

Does education in business or economics make students less prosocial and more selfish? A simple method to study the effect of treatment on dichotomous outcomes with paired data is the non-parametric McNemar test (Lachenbruch, 2023). Table 4 display this test applied to our research question and categorize students into four groups based on their responses to the survey question “contributing to a better society in a future career” before and after six semesters of B&E studies. The result of this test is presented in section 5, where we also analyse potential variations related to specializations within the BE program. After carrying out the McNemar test, we proceed to estimate a difference-in-differences model as described next.

Table 4: The McNemar test: B&E students only

NO CHANGE: Binary variable=1 before and after treatment	MORE PROSOCIAL: Binary variable=0 before and =1 after treatment
LESS PROSOCIAL: Binary variable=1 before and =0 after treatment	NO CHANGE: Binary variable=0 before and after treatment

Note: The binary variable indicates whether or not students value the career trait “to contribute to a better society” as very important (=1) or not (=0).

## 2. Difference-in-difference specification

While the McNemar test provides important insights when data is available both pre-and post treatment, our main approach is to use a difference-in-difference (DiD) specification. For our specific context, Law and ESS students serve as a natural control group. Importantly, Law students are not at all exposed to a traditional business and economics education, while ESS students combine environmental studies with business and economics education specializing in either environmental economics or sustainable business.

The interpretation on the DiD estimator as casual in a between-subject analysis (a cross sectional sample) rely on the assumption that there are no differences in selection across cohorts. There are however many potential reasons why this assumption could be problematic (both related to random chance and related to age-specific characteristics of specific cohorts). While it is possible to test for some observable characteristics in our study, several unobservable characteristics could be important confounders. A potential important confounder is attrition. A possible explanation for earlier findings of “indoctrination” (or lack thereof) in cross sectional studies is simply that more prosocial/generous students could be more or less likely to drop out. Any systematic difference between junior student groups observed in the start of their programs and more senior student groups, could simply stem from attrition. By using a within-subject analysis (panel data) we do not need to rely on the assumptions of same selection across different cohorts and the result does not hinge upon attrition. As can be seen in table 3 the cohorts in our sample are similar but far from identical, in the coming regression we include cohort effects to reduce the risk of estimation bias.

A second key assumption for the DiD estimator is that of parallel trends which applies to between- and within-sample estimators alike. In our data, there is a possibility that students who opted for B&E studies inherently had a greater propensity to become more selfish or less prosocial, regardless of their life choices (i.e. they could become more selfish regardless of whether they had chosen a different study program or made alternative life choices). This is notoriously difficult to test without randomly assigning students to different programs (and even if it were possible, such considerations would lack policy relevance, as this is not how university program admissions are conducted). What we can do to alleviate some of this concern is to look at the “before” period in some more detail. As can be seen in table 3 there are no significant differences between B&E students and the control group, and we further see that the within-gender figures are practically identical (with a 1,3 percentage point difference for men and a 1,7 for women). Hence, while we cannot completely rule out the possibility that B&E students were already on a different trajectory regarding prosocial values, we are able to demonstrate that B&E students and those in the control group

are very similar in terms of prosocial values at the same age.

The DiD specification is as follows:

$$Y_{it} = \alpha_i + \beta_1 \cdot \text{Treatment}_i + \beta_2 \cdot \text{After}_t + \beta_3 \cdot (\text{Treatment}_i \times \text{After}_t) + dX_i + \mu_{it} \quad (1)$$

The outcome variable  $Y_{it}$  is defined as a binary variable equal to 1, if student  $i$  at time  $t$ , answered that contributing to a better society was very important in a future professional career (and zero otherwise). Hence, the subscript  $i$  indexes individuals and  $t$  the survey period.  $\text{Treatment}_i$  is a dummy variable equal to one if the student is enrolled to the B&E program and zero otherwise.  $\text{After}_t$  is a dummy variable indicating whether the period is before treatment or after treatment. More specifically, if the survey is conducted at the beginning of the first semester ( $=0$ ) or at the sixth semester ( $=1$ ),  $\alpha_i$  is individual fixed effects and  $dX_i$  is a vector of control variables (sex, cohort, and their interaction effects with the dummy  $\text{After}_t$ ).

Our primary variable of interest is the interaction effect between treatment and  $\text{After}_t$  (i.e.  $\text{Treatment}_i \times \text{After}_t$ ). This captures the effect of B&E studies on our measure of prosocial values ( $Y_{it}$ ). We estimate regressions both with and without controls. The strategy for clustering standard errors is discussed in the Results section.

We employ a fixed effects linear probability model (LPM) to estimate the DiD specification, following standard practices in the literature. Given the binary nature of our outcome (dependent) variable, we also run a logistic regression as robustness check (discussed further in the subsection on validation and robustness tests). Additionally, since we have survey data with ordinal responses we estimate an ordinal logit regression, assigning numerical values to each alternative (1=not important, 2=somewhat important and 3=very important).<sup>4</sup>

We are also interested in understanding whether younger individuals are more more likely to experience significant changes in their values between the first and sixth semesters, i.e. if they are more "malleable" than their older peers. Therefore, we examine the likelihood of changes in prosocial values over time across different age groups. In the context of this study, a common practice is that students either proceed directly from high school to university or take a gap year to work or travel before university enrollment. In our sample, a little over 52 percent of the individuals, who are 20 years old or younger at enrollment, follow this norm. The rest of the population (students 21 years old and older) have taken a more "non-standard" path to university education. Although we cannot track the exact activities of these individuals before enrolling in a university program, it is common for these students to enroll in stand-alone university courses or to spend more time working and/or traveling. Using the same specification as outlined earlier, we conduct separate

regressions for the younger half of the sample (20 years old and younger) and the older half (21 years old and older).

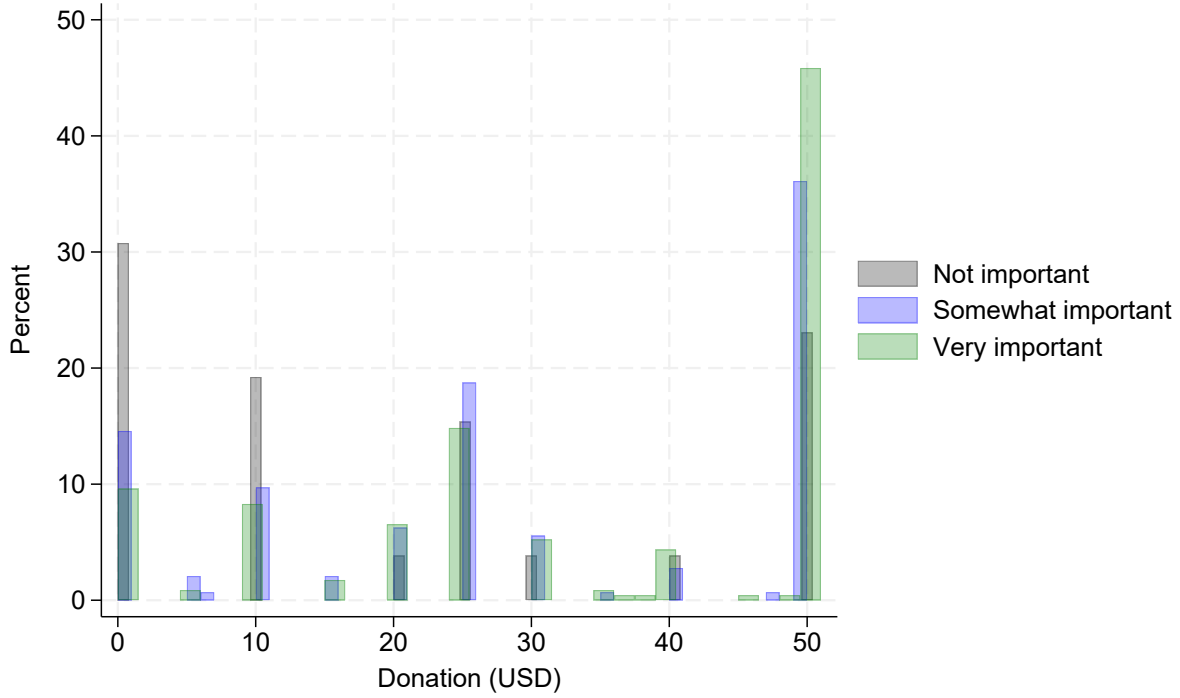
$$\begin{aligned}
Y_{it} = & \beta_0 + \beta_1 \cdot \text{Treatment}_i + \beta_2 \cdot \text{After}_t + \beta_3 \cdot \text{Young}_i \\
& + \beta_4 \cdot (\text{Treatment}_i \times \text{After}_t \times \text{Young}_i) + \beta_5 \cdot (\text{Treatment}_i \times \text{After}_t \times \text{Old}_i) \\
& + \beta_6 \cdot (\text{After}_t \times \text{Young}_i) + \beta_7 \cdot (\text{Treatment}_i \times \text{Young}_i) \\
& + dX_i + \mu_i
\end{aligned} \tag{2}$$

In the above specification we are interested in the treatment effects on the young students following the "standard-path" to university studies as captured by the interaction term  $(\text{Treatment}_i \times \text{After}_t \times \text{Young}_i)$  and we also compare with the older students following a "non-standard" path  $(\text{Treatment}_i \times \text{After}_t \times \text{Old}_i)$ . As before,  $dX_i$  is a vector of control variables, and as is standard in the literature we include all lower level associations between variables to correctly identify the of treatment effect on the young and the old students respectively.

## B. Stated prosocial values and prosocial behavior

A valid concern regarding survey data is whether stated values translate into behavior when real stakes are at play. To assess if our survey measure of prosociality corresponds to actual prosocial behavior (generosity), we conducted an incentivized experiment. All students in the 2019 cohort could at their sixth semester (2022) enter into a lottery with a 10 percent chance to win 50 USD. The students that choose to participate (n=381, >80% participation rate) were instructed to allocate the potential lottery win of 50 USD<sup>5</sup> between themselves and a charity of their own choice (they were provided with a list of the most popular charities in the country and also two charities that was identified by Givewell<sup>6</sup> as especially effective e.g. Against Malaria Foundation). The students could keep/give any sum between 0-50 USD. This experimental design (often referred to as charity dictator games) are commonly used to elicit altruistic behavior (Bilén et al., 2021). Figure 1 visualize donations by level of stated prosociality (as measured by the career trait contributing to a better society).

Figure 1: Correlation between donations (USD) and self-reported importance of contributing to a better society



Note: Histogram on donations explained by prosocial survey measure. Pwcorr 0.1833 (p-value: 0.0002).

As can be seen prosocial behaviour correlate significantly with prosocial values. Keeping all the 50 USD (donating nothing) is for example 3 times as common in the "not important group" compared to the "very important" group. Comparing these two groups we find an average difference with regards to donation of 12.30 USD, corresponding to roughly 40% of mean donations.

To assess to what degree students' survey responses correspond to costly generous behavior, we also run the following regression:

$$\text{DonationUSD}_i = \beta_0 + \beta_1 \cdot \text{SurveyMeasure}_i + \epsilon_i \quad (3)$$

where the dependent variable is the sum in USD allocated to charity by individual  $i$ , and  $\beta_1$  represent the explanatory power of the survey measure on charity donations. The results show that prosociality (as measured by the career trait contributing to a better society) is significantly positively correlated with donation behaviour, while other career traits do not affect such behaviour. The regression results are

presented in Appendix Tables A.3 and A.4.

## V. Results

### A. Does education in business and economics make students more selfish?

Summing up what we know so far, B&E students value prestige and economic compensation significantly more than our control group at enrollment, but we found no significant difference with regards to prosocial values, see Table 2. Importantly, our measure of prosociality seem to explain generous (prosocial) behaviour. We now turn to the result of our main research question: does studying a B&E program make students less prosocial and more selfish?

The impact of studying a B&E bachelor program on prosocial values is presented in Table 5. Model 1 and Model 2 estimate the average treatment effect ( $\text{Treatment}_i \times \text{After}_t$ ) for everyone no matter their age at enrollment (refer to Equation 1). Notably, we do find a significant negative treatment effect on prosocial values from B&E education. The effect size corresponds to a 7-8 percentage point decrease in the probability of students valuing the importance of contributing to a better society in their future careers after studying B&E. Standard errors are clustered at the individual level but the results are robust for various clustering strategies.<sup>7</sup>

Informed by studies in psychology that suggest that individuals' values tend to stabilize after adolescence (Bardi et al., 2009; Vecchione et al., 2016), and that attitudes towards egalitarianism (universalism) continue to fluctuate between 18-20 and stabilize somewhere thereafter (Rekker et al., 2015) we study potential treatment effects for younger and older students separately. The interaction term ( $\text{After} \times \text{B\&E} \times \text{Young}$ ) in Table 5 estimate the effect for students that take the "standard path" to university studies, i.e. enrolling directly after graduating high school or after a gap year. These students generally turn 19-20 years at the year of enrollment and is hence in an age were individuals' values still hasn't stabilized according to Rekker et al. (2015). These younger students make up 52% of the sample. We then separately estimate the effect for the older students that are between 21 and 44 years old using the interaction term ( $\text{After} \times \text{B\&E} \times \text{Old}$ ), these students make up 48% of the total sample. Looking at the old and young individuals separately it becomes clear that the negative treatment effect on prosocial values is completely driven by the younger students. While there is no effect at all for individuals 21 years old and older there is a quite substantial effect of around 15 percentage points for the younger B&E students. Our data thus suggest that the prosocial values of young students are more malleable and susceptible to the influence of B&E education, which indeed has

Table 5: LPM Fixed-effect DiD regression on the effect of B&E studies on Prosocial values

	Model 1	Model 2	Model 3	Model 4
Time	-0.00220 (0.0260)	0.0596 (0.0460)	-0.0583 (0.0366)	0.00626 (0.0505)
(After $\times$ B&E)	-0.0706* (0.0372)	-0.0824** (0.0375)		
(Female $\times$ After)		-0.0435 (0.0383)		-0.0489 (0.0384)
(After $\times$ B&E $\times$ Old)			0.0109 (0.0547)	0.00338 (0.0544)
(After $\times$ B&E $\times$ Young)			-0.147*** (0.0505)	-0.165*** (0.0514)
Controls	No	Yes	No	Yes
Observations	1814	1814	1814	1814

Note: Standard errors in parentheses (clustered at the individual level). The table displays DiD estimation of enrolling in B&E studies on prosocial values (valuing contributing to a better society as "very important"). Model 2 and Model 3 use the following controls: Female-dummy\*After and Cohort\*After. In the case of the triple interaction, the lower-order associations are included. The variable "young" includes all individuals that enrolled in university studies directly after high school or took a gap year, hence individuals up to 20 years old (52 percent of the sample). The "Old" category includes all the other individuals. \* $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

a negative effect on this group. It can be noted the main result remains significant adjusting for multiple hypothesis testing.<sup>8</sup>

In Table 5 the dependent variable was coded as a binary variable equal to 1 if student  $i$  at time= $t$  answered that contributing to a better society is "very important" in a future professional career (and equal to zero otherwise). In Table 6, we extend beyond this binary variable analysis and utilize the full spectrum of survey responses to examine the effects on the ordinal scale, which includes three options: "not important", "somewhat important", and "very important", employing an ordered logistic regression. As can be seen in Table 6 the probability of a young B&E student to answer that contributing to a better society in a future career is "somewhat important", is approximately 9 percentage points higher (see regression 3) than for a control student, and three percentage point higher to respond "not important". Overall, the probability that young students consider contributing to a better society as very important in their future professional careers decreases by approximately 12.5 percentage points as a result of B&E studies. The findings support those shown in Table 5 and further suggest that older students appear to be unaffected by the treatment.

Table 6: Ordered Logit DiD regression, marginal effects: The effect of enrolling in B&E on Prosocial values

	(1) All	(2) If Young	(3) If Young	(4) If Old	(5) If Old
Not Important	0.0141 (0.00858)	0.0306** (0.0122)	0.0359*** (0.0131)	-0.00767 (0.0114)	-0.00626 (0.0117)
Somewhat Important	0.0476* (0.0287)	0.101*** (0.0383)	0.111*** (0.0383)	-0.0295 (0.0436)	-0.0231 (0.0431)
Very Important	-0.0616* (0.0372)	-0.131*** (0.0496)	-0.147*** (0.0502)	0.0371 (0.0549)	0.0294 (0.0548)
Controls	Yes	No	Yes	No	Yes
Observations	1779	929	929	850	850

Note: Standard errors in parentheses (clustered at individual level). Controls used: Gender, cohort and age. "If Young" refer to all individuals 20 years old or younger, at the year of enrollment. "If old" refer to all individuals older than 20 years.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

## B. The effect on treatment versus control

Do B&E student become more selfish or could the effect we observe be explained by the control group becoming more prosocial? In Table 7 we see that the young individuals in the control and treatment groups are very similar pre-treatment ( $\text{Chi}^2=0.669$ ) and that the effect over time is driven primarily by negative changes in the B&E students, but that positive changes in the control group also play a role.

Table 7: Prosocial values by treatment and control before and after

	Before			After		
	B&E	Control	p-value diff ( $\text{Chi}^2$ )	B&E	Control	p-value diff ( $\text{Chi}^2$ )
Young	58.68%	60.61%	0.669	49.17 %	65.80%	0.000
All	60.71%	64.76%	0.207	53.42%	64.54%	0.001

Note: Simple  $\text{Chi}^2$ -test on treatment and control before and after. The table display the percentage of students stating that contributing to a better society is very important in a future career per the whole sample and for the young (up to 20 years old).

A simple  $\text{Chi}^2$  test comparing all individuals in the control and treatment groups before and after six semesters of university studies suggest that groups become significantly different with regards to prosocial



values (p-value=0.001), see Table 7 .

Table 8: Within-Group comparison of Prosocial Values, B&E and control group

Within-group over time	Category	Before	After	p-value diff (Chi2)	n
B&E	All	60.71%	53.42%	p=0.027	453
	Young	58.68%	49.17%	p=0.036	242
Control	All	64.76%	64.54%	p=0.945	454
	Young	60.61%	65.80%	p=0.247	231

Note: Chi2-tests between the same students before and after six semester of university studies, we see a significant effect on B&E students, but not on the control group.

It is also informative to carry out Chi2-tests on control and treatment groups and compare over time. Table 8 indicate again that the B&E students have become less prosocial, not only compared to their peers in other programs but also to their former selves before they enrolled in B&E studies. Consistent with the DiD regression (as well as the simple Chi2-test) we find no evidence of any effect on the control group or on the older B&E students.

As explained in the empirical strategy section another way to study the effect of treatment in the case of panel data (as we have here) is to perform a McNemar test. This test does (in contrast to a simple Chi2-test) take into account the use of panel data but in contrast to the DiD estimation it does not make use of a control group.

Table 9: The effect of B&E education on prosocial values of B&E (McNemar-test)

Before	After	Treatment Effect (all)	Treatment Effect (young)	Treatment Effect (old)
60.71%	53.42%	Yes, (-7.3 pp) (p=0.0065)	Yes, (-9.5 pp) (p=0.007)	No, (-4.7 pp) (p=0.245)

Note: McNemar Chi2-test on B&E students. The table displays the percentage of students stating that contributing to a better society is "very important" in a future career, as well as the percentage point difference over time.

As can be seen in Table 9 the McNemar test also provide evidence for a significant treatment effect on the whole sample and on the younger students (where the effect is stronger).

In our main specification the control group consists of Law students as well as students enrolled in the Environmental Social Science program, a program that combine environmental B&E specializations in either sustainable business or environmental economics. These students are more prosocial at enrollment than both Law and B&E students. Therefore, as a robustness test, we restricted the control to Law students only. The regression results of this test, presented in Table ??, show that the outcomes remain essentially unaffected.

### C. Selection of within B&E major and impact on prosocial values

At the European business school in this study, as well as in most other business and economics programs around the world, students can choose different majors. As Table 10 illustrates, students’ prosocial values differ with the choice of major. The differences in the first column are purely selection effects, as no choice of major has yet been made at this time. Analysing majors give us some insights into possible mechanisms for treatment effects associated with B&E studies. Collapsing various business and economics majors into a single ‘econ-dummy,’ a common practice in the literature (for a discussion, see Miragaya-Casillas et al., 2023), might conceal some significant heterogeneity. While “homo-economicus” most often serve as a theoretical foundation for why one could expect a treatment effect from (micro)economics (students are assumed to internalize the rationality and selfishness of “the economic man”), it is far from obvious how this possible mechanism compares to very different theoretical foundations and empirical emphasis in business studies. Finance-, accounting-, or management majors for example may more explicitly emphasize corporate profits and spend less time on societal concerns than what is usually done in (micro)economics.

Table 10: Specialization-wise (B&E major-specific) treatment effects on prosocial values

Specialization (major)	Before	After	Diff	n
Economics	76.9%	63.5%	-13.5%	52
Accounting	56.8%	32.4%	-24.4%	74
Industrial & Financial Management	68%	54%	-14.0%	50
Management	58.1%	54.1%	-4.05%	74
Corporate Sustainability & International Business	75.6%	80%	+4.4%	45
Marketing	56.7%	53.3%	-3.3%	60
Finance	47.4%	49.5%	+2.1%	95

Note: specialization-wise (major-specific) treatment effects on prosocial values (percentage stating that contributing to a better society in a future career is very important).

Based on Table 10 we see that selection into majors as well as the effect of major-selection seem to play a role for shifts in students’ prosocial values. Due to the relatively low number of observations per major, we exercise caution in drawing conclusions. However, it is noteworthy that a large negative significant effect (-24.4 percentage points) was observed among accounting students ( $p=0.0002$ ) in a McNemar’s Chi-squared test. This result holds even under the most conservative multiple hypothesis testing adjustments (The Bonferroni correction) treating each separate major as one hypotheses. The effect on economics majors (-13.5 percentage points), is marginally significant at  $p=0.052$ , but it can be noted that these students are on average more prosocial than their program peers at enrollment. Notably, almost all majors are associated

with a negative effect on prosocial values. The exception is finance, which appears to attract individuals with lower prosocial values already at enrollment. Corporate sustainability is the only major combining high prosocial self-selection with a positive prosocial effect over time.

## VI. Conclusions

In this paper, we have studied the still unresolved question of whether enrolling in Business and Economics studies makes students less prosocial. This question has spurred academic interest for decades, and our research methodology and data provide perhaps the most robust evidence to date, offering causal insights into the effects of such educational choices.

We contribute to this field by estimating a difference-in-difference model on panel data spanning a full bachelor program for both treatment and control. Specifically, we follow three cohorts over time (over 900 students), from the very first weeks of studies until the sixth and last semester of the bachelor program. Further, we validate our survey measure of prosocial values (self-reported importance of contributing to a better society in a future career) in a charity dictator game. The survey measure significantly correlates with student donation behavior (generosity).

A novel aspect of this study is that we elicit the importance of age. Informed by studies in psychology we find that younger students appear to be significantly more malleable with respect to their prosocial values. Indeed, our results suggest that the so called indoctrination effect associated with Business and Economics studies is driven by the younger students. While we also find a weak overall indoctrination effects on the whole B&E sample, there is no effect on the older B&E students.

Finally, we examine selection and treatment effects associated with the choice of majors (disciplinary specializations) within the B&E program. While evidence points to treatment effects on Economics majors, a particularly pronounced negative effect on prosociality is observed among Accounting majors.

From a human resources perspective, our results highlight the importance of continuously discussing how Economics and Business are taught. Economics and Business education have been criticized for not bringing in broader societal perspectives. Ghoshal (2005) argues that “...by propagating ideologically inspired amoral theories, business schools have actively freed their students from any sense of moral responsibility”. Even if this statement may be far-reaching, there has been widespread recognition by Business Schools themselves to emphasize the role of ethics and sustainability, and several acclaimed higher education institutions have included these ambitions in their mission statements and strategies. For example, Harvard University<sup>9</sup>:

“...learning how they [students] can best serve the world”; Yale University<sup>10</sup>: “...educates aspiring leaders worldwide who serve all sectors of society”; Cornell University<sup>11</sup>: “...applying the knowledge we create for the benefit of society”. Our results emphasize the importance for Business Schools to continuously reflect on how Business and Economics students internalize theoretical models and the effect this has on the broader society. We recommend future research in this area to further explore the effects of age and specializations to support universities and Business Schools in this work.

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# Appendix

## I. Tables and Figures

Table A.1: Logit DiD regression on the effect of enrolling in B&E on Prosocial values

	Model 1	Model 2	Model 3	Model 4
Time	-0.00226 (0.0267)	0.0587 (0.0446)	-0.0608 (0.0381)	0.00161 (0.0501)
(After $\times$ B&E)	-0.0686* (0.0371)	-0.0793** (0.0373)		
(Female $\times$ After)		-0.0462 (0.0373)		-0.0520 (0.0375)
(After $\times$ B&E $\times$ Old)			0.0145 (0.0551)	0.00980 (0.0548)
(After $\times$ B&E $\times$ Young)			-0.144*** (0.0499)	-0.161*** (0.0503)
Controls	No	Yes	No	Yes
Observations	1814	1814	1814	1814

Note: Random effects Logit model, with standard errors in parentheses (clustered at the individual level). The Table displays DiD estimation of enrolling in B&E studies on prosocial values (valuing contributing to a better society as "very important"). Model 2 and Model 3 use the following controls: Female-dummy\*Time and Cohort\*Time. In the case of the triple interaction, the lower-order associations are included. The variable "young" includes all individuals that enrolled in university studies directly after high school or took a gap year, hence individuals up to 20 years old (52 percent of the sample). The "Old" category includes all the other individuals.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

Table A.2: LPM DiD regression on the effect of enrolling in B&E on Prosocial values

	Model 1	Model 2	Model 3
Time	0.0479 (0.0495)	-0.0753* (0.0427)	-0.00907 (0.0569)
(Time $\times$ B&E)	-0.0679* (0.0395)		
(Female $\times$ After)	-0.0515 (0.0399)		-0.0552 (0.0399)
(Time $\times$ B&E $\times$ Old)		0.0279 (0.0590)	0.0190 (0.0588)
(Time $\times$ B&E $\times$ Young)		-0.128** (0.0519)	-0.145*** (0.0525)
Controls	Yes	No	Yes
Observations	1704	1704	1704

Note: Standard errors in parentheses (clustered at the individual level). The table is based on equation 2 and restricted to law students in the control group.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$



Table A.3: Regression results for donations in USD with survey measures as explanatory variables

Variable	All
High prestige	-2.092 (1.819)
Interacting with others	1.856 (1.490)
High Pay	-1.280 (1.948)
Challenging job	-0.848 (1.935)
Contributing to Society	5.362*** (1.713)
Family life	-0.112 (1.866)
Constant	23.57*** (7.945)
Observations	378

Note: Standard errors in parenthesis, survey measures are either "not important", "somewhat important" or "very important", hence going from "not important" to "somewhat important" and from "somewhat important" to "very important" is each associated with a 5,4 USD increase in donations on average.

\* $p < 0.1$  \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A.4: Regressing donations(USD) on prosocial values (contributing to a better society)

Variable	Model 1	Model 2
Somewhat important	7.327* (4.043)	
Very important	12.30*** (3.940)	
Not important/Somewhat important vs Very important		-6.035*** (1.899)
Observations	381	381

Standard errors are shown in parentheses. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A.5: Raw Correlation

	Prestige	Interact	Pay	Challenge	Society	Family
Prestige	1.0000					
Interact	0.2493	1.0000				
Pay	0.5567	0.1499	1.0000			
Challenge	0.2387	0.2733	0.2166	1.0000		
Society	0.0965	0.3639	0.0361	0.3800	1.0000	
Family	0.1189	0.2099	0.0996	0.1837	0.2947	1.0000

## II. Experiment and Survey

### English Translation of the Dictator Game Experiment

Divide SEK 500 between you and an organization of your choice. If you choose to answer this question, you will be entered into a lottery with a 10% chance of winning SEK 500 (the research funding for this comes from Swedbank).

All you have to do to enter the lottery is to choose what you want to do with the money if you win. Your choice is to split the 500 kr between yourself and the organization you choose from the list below (see subquestion below). You can choose to keep any amount between 0 and 500 kr.

The email address you provide will be used to contact you for possible payment or to show that your money has been paid to the organization you have chosen. The payment will be made by an administrator you have not encountered during your studies and who does not know any details about this project or about you as a person. After the payment to all winners has been made, all data will be anonymized.

**I will distribute any prize money as follows (choose between 0 and 500 to keep for yourself; any remainder will be given to the organization of your choice below):**

SEK to keep for yourself: \_\_\_\_\_ kr

SEK to give to the organization I choose from the list below: \_\_\_\_\_ kr

**List of organizations to choose from:**

- Against Malaria Foundation
- Barncancerfonden (research fund for child cancer)
- Cancerfonden (research cancer fund)
- GiveDirectly
- Hjärt-Lungfonden (national organization for research combating heart and lung conditions)
- Doctors without Borders (MSF)
- Save the Children
- Stadsmissionen Göteborg (local organization for aiding the homeless)
- UNICEF

- WWF

# English Translation of the Swedish Text of the 2016–22 Survey

## Your Future Professional Career

Please indicate below how well you think the following statements are consistent with your own opinion about what is important to you in a future professional career. It is important to ...

	Not im- portant	Somewhat impor- tant	Very im- portant	No opin- ion
Get a respectable position in my future career	O	O	O	O
Have a job where I interact with many people	O	O	O	O
Have a high salary	O	O	O	O
Have an intellectually challenging job	O	O	O	O
Contribute to a better society	O	O	O	O
Have a job where it is possible to combine work with family life	O	O	O	O

## Notes

<sup>1</sup>Miragaya-Casillas et al. (2023) emphasize that the term “econ-students” in this literature does not necessarily pertain to those enrolled in traditional microeconomics courses, where the concept of “homo economicus” might be an explicit or implicit foundational assumption about human motivations. Instead “econ-students” are often used as an umbrella term including students enrolled in finance, marketing, accounting, or other subjects within business administration collapsed into an “econ-dummy”.

<sup>2</sup>We do not have data from 2017 due to technical issues in the survey distribution process for the 2017 cohort.

<sup>3</sup>Very few students reply “no opinion” and removing these observations from the main, binary, model specification, do not affect the results.

<sup>4</sup>Note that the few students that state that “no opinion” are removed in this specification.

<sup>5</sup>This corresponds to about seven lunches in nearby restaurants, and hence would for most students be considered a significant amount.

<sup>6</sup>Givewell is an American non-profit charity assessment and effective altruism-focused organization. The organization assess charities bases on the cost-effectiveness (rather than metrics of overhead).

<sup>7</sup>In this specification we have estimated regressions with individual fixed-effects to account for all time-invariant heterogeneity and we also cluster standard errors on the individual level (it can be noted that robust standard errors provide basically the same standard errors). However, there is a strong argument to be made for clustering standard errors at the treatment group (and year) level (B&E vs control programs). Given our three programs and three cohorts, this give us 9 clusters in total, generally considered as (too) few risking underestimating standard errors (Cameron and Miller, 2015). As could be seen in 10 for the B&E program we also have information about specializations (further explored in 5.3). The B&E students divide into new classes based on these specializations (majors) after three semesters. Students hence spend the last year together within these specializations before responding to the survey on the sixth semester. An argument could therefore be made for treating these specializations as clusters (both with regards to exposure to educational content as with regards to possible peer-effects). If so, we get a total of 30 clusters if we account for 2 control programs and 8 specializations within the B&E program for each cohort. A potential downside with this approach is that these are rather small clusters. A third alternative is to disregard the cohorts but account for specializations, using this method we would for example consider all finance majors as one cluster, no matter the cohort. This also have downsides, since this would not account for the potential peer effects within classes (specializations). In this case we would end up with 10 clusters in total. Importantly, the significant negative effect on the young B&E students remain significant (at  $p < 0.01$ ) irrespective of level of clustering. To account for few clusters we further calculate wild bootstrap robust standard errors and the effect on the young remain significant with p-values for nine clusters (at  $p = 0.000$ ), 10 clusters ( $p = 0.044$ ) and 30 clusters ( $p = 0.004$ ).

<sup>8</sup>Given that we specify a model that test for a treatment effect on the whole sample as well as on the old and the young students separately we test the robustness of the results using different methods of multiple hypothesis testing. Applying even the most conservative method (the Bonferroni correction) still provide a significant result for the treatment effect on younger students ( $p\text{-value} = 0.003$  after correction and  $0.001$  before correction with controls, and  $p\text{-value} = 0.012$  after correction and  $0.004$  before correction without controls).

<sup>9</sup> Harvard College Mission, Vision, and History

<sup>10</sup>Yale University Mission Statement

<sup>11</sup>Cornell University Community Welcome Statement