

Does Economics and Business Education Wash Away Moral Judgment Competence?

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ABSTRACT

In view of the numerous accounting and corporate scandals associated with various forms of moral misconduct and the recent financial crisis, economics and business programs are often accused of actively contributing to the amoral decision making of their graduates. It is argued that theories and ideas taught at universities engender moral misbehavior among some managers, as these theories mainly focus on the primacy of profit-maximization and typically neglect the ethical and moral dimensions of decision making. To investigate this criticism, two overlapping effects must be disentangled: the self-selection effect and the treatment effect. Drawing on the concept of moral judgment competence, we empirically examine this question with a sample of 1,773 bachelor's and 501 master's students. Our results reveal that there is neither a self-selection nor a treatment effect for economics and business studies. Moreover, our results indicate that – regardless of the course of studies – university education in general does not seem to foster students' moral development.

Key Words: Economics and Business Education, Moral Judgment Competence, Moral Reasoning, Self-Selection Effect, Treatment Effect

Section: Teaching Business Ethics

List of Abbreviations:

CMD	cognitive moral development
DIT	defining issues test
MJC	moral judgment competence
MCT	moral competence test

I. INTRODUCTION

The recent economic and financial crisis as well as accounting and corporate scandals over the last decades such as Enron (2001), WorldCom (2002), Global Crossing/Qwest (2002), Merck & Co. (2002), AOL Time Warner (2002), Tyco International (2002), Computer Associates (2004), Swissair (2001), Ahold (2003), YLine (2003), Parmalat (2003), Adecco (2004), ABB (2004), and Siemens (2006) are often argued to have arisen not only from 'bad' corporate governance, internal control failures, or missing codes of conduct but also from managers' lack of moral judgment competence (MJC), i.e., their "capacity to make decisions and judgments which are moral and to act in accordance with such judgments" (Kohlberg 1964, p. 425). For instance, the testimonies of Enron employees reveal that both Enron's former chairman and the CEO did not appear able to make adequate decisions when confronted with the existence of fraudulent accounting methods (Cohan 2002, p. 276). Similar findings are obtained by Soltani (2014) based on a comparative analysis of "high-profile" American and European corporate scandals, most of which involve fraudulent reporting or accounting practices. In addition, the subprime mortgage crisis and most recently the Volkswagen emissions scandal are also examples of the devastating consequences of senior management's lack of moral competence.

Although MJC might be influenced by genetic factors (e.g., whether people are inherently evil or good), socialization and education are also important factors (Piaget 1932/1965; Kohlberg 1969; Rest 1983; Lind 2008). This well-known impact of certain aspects of education on MJC brings the discussion to universities and business schools: are these educational institutions not able to create responsible managers? Theories and ideas taught in economics and business education are claimed to engender moral misbehavior among some managers because these theories mainly focus on the primacy of profit maximization and typically neglect the ethical and moral dimensions of decision making. For instance, Ghoshal (2005, p.

75) argues: "Business schools [...] do not need to create new courses; they need to simply stop teaching some old ones." However, this critique of economic theories may miss the point of MJC. Business and economic courses usually deal with *economic* problems which have to be solved with economic instruments. Since the university education in Europe is primarily focused on knowledge transfer and does not follow a Humboldtian concept of holistic academic education, this reasoning relates to almost all study subjects. According to our experience, large public universities in German-speaking countries generally do not offer an educational environment in which optimal moral development can occur. Such education requires exposure to moral models and higher-stage reasoning as well as involvement in moral discussion and altruistic activity (Power et al. 1989; Lind 2015a). Moreover, Neesham and Gu (2015) show that moral-identity-focused teaching in a business ethics course can positively influence moral judgment, whereas simple rule-based teaching cannot. Such learning environments are also not ensured by the various accrediting institutions, such as the Association to Advance Collegiate Schools of Business (AACSB), the Association of MBAs (AMBA), and the European Quality Improvement System (EQUIS), because these institutions only ask for the inclusion of ethics in the curriculum but do not directly assess the learning environment. The impact of such ethics courses on students' moral development is questionable as long as the overall study situation remains unchanged, which is also indicated by the mixed findings in the ethics education literature (Ritter 2006; Awasthi 2008; Lau 2010). Therefore, we do not expect to find a significant (neither negative nor positive) relationship between the study of economics and business and students' moral development. Indeed, as Neubaum et al. (2009, p. 10) note, the executives involved in the WorldCom and Enron scandals did not receive their degrees from major business schools, which is also the case with Volkswagen's former CEO.

To investigate this relationship accurately, one has to distinguish two effects on students' moral development: the self-selection effect and the treatment effect. The self-selection effect concerns whether economics and business students differ *a priori* from other students with respect to their moral understanding and behavior. The treatment effect concerns whether economics and business education itself has an impact on students' moral concepts and behavior and is particularly relevant for the discussion regarding responsible management education. To analyze both effects, we draw on Kohlberg's (1969) six-stage scheme of cognitive moral development (CMD) and focus on the construct of MJC as defined by Kohlberg (1964). The application of a construct that is well established in psychological and sociological research on ethical behavior (Ishida 2006) yields valuable insights into the existence of both the self-selection and the treatment effects of economics and business. Our empirical findings for a sample of 1,773 bachelor's and 501 master's students at a large university in Switzerland indicate that both the self-selection as well as the treatment effect of the study of business and economics on students' MJC do not exist. Remarkably – and regardless of the course of studies – our results reveal that the education at the sample university does not foster the moral development of its students. In addition, we provide insights into other factors that determine MJC, such as cognitive capacity, family background, and motivational factors.

II. MORAL DEVELOPMENT OF ECONOMICS AND BUSINESS STUDENTS: SELF-SELECTION VERSUS TREATMENT EFFECTS

1. *Previous Evidence on the Moral Attitudes and Behavior of Economics and Business Students*

In a provocative article, Ghoshal (2005) argues that a set of ideas and assumptions that have come to dominate business and management research have had a very significant and nega-

tive influence on the practice of management. He suggests "that by propagating ideologically inspired amoral theories, business schools have actively freed their students from any sense of moral responsibility" (Ghoshal 2005, p. 76). He argues that business schools have propagated a hidden ideology in the pretence of science and therefore caused much harm, as theories in social sciences tend to be self-fulfilling. "Human beings – even chief executives – are influenced by the ethical codes of the communities in which they live. If we treat managers as financially self-interested automatons who must be lured by the carrot of stock options and beaten with the stick of corporate governance, that attitude will become self-fulfilling" (Gapper 2005, p. 101). According to Ghoshal (2005) the taught theories stash away any sense of social and moral responsibility and make business students and (future) managers less trustworthy by inducing managerial actions that enhance opportunistic behavior. This critique of business education is not new, and as such, this topic has been investigated by a number of previous empirical and experimental studies. We distinguish two streams of research: research on the existence of the self-selection and the treatment effect of business and economics studies in general and studies within the business ethics education literature. In addition to these two areas of research, there is a substantial body of empirical studies examining the impact of individual and organizational factors on moral judgment. These studies have recently been discussed and summarized in an extensive literature review by Craft (2013).

The first stream of research is characterized by a variety of different research settings including prominent studies on fairness perceptions of price and allocation mechanisms (Kahneman et al. 1986b, 1986a; Frey et al. 1993; Cipriani et al. 2009) and dilemma situation between profit maximization and the dismissal of workers (Rubinstein 2006; Cipriani et al. 2009). Findings from these studies tend to support the self-selection effect and the stereotype of the 'selfish' economist, but results regarding the treatment effect are ambiguous. Other studies

investigate differences between economics and non-economics students through experiments and structured games (Marwell and Ames 1981; Kahneman et al. 1986a; Carter and Irons 1991; Frank et al. 1993; Selten and Ockenfels 1998; Frank and Schulze 2000) as well as actual behavior, such as charitable giving (Frey and Meier 2004), return behavior of lost letters (Yezer et al. 1996), and cheating on income-based dues for professional organizations (Laband and Beil 1999). Although experimental evidence indicates that economics students show more defective (i.e., less cooperative and more corrupt) behavior than non-economics students, some studies reveal a completely reverse picture, with economists being even more cooperative than non-economists (Yezer et al. 1996; Laband and Beil 1999). Overall, while studies within this first stream of research have revealed significant – both positive and negative – differences in fairness perceptions, defective behavior and actual behavior between economists and non-economists, it is difficult to combine these findings to an overall picture. Since the cognitive mechanisms of the study subjects are not revealed the results do not allow for any inferences about a person's MJC. Moreover, only a limited number of studies differentiate between the self-selection and the treatment effect and as such the findings are difficult to interpret.

Only two studies, Tse and Au (1997) and Neubaum et al. (2009), focus on the ethical positions and moral philosophies of economists. Both studies predominantly report no differences between business and non-business students. Tse and Au (1997) investigate differences in students' evaluations of ethical standards. Neubaum et al. (2009) use a well-established psychological construct of ethical positions to investigate their research question. Although they find no differences between business and non-business students with respect to personal moral philosophies, particularly idealism and relativism, they reveal a positive and significant treatment effect of business education with respect to profit attitudes: compared with business

freshmen, business seniors are more likely to believe that businesses should be judged on social and environmental indicators and that these indicators should be considered in employment choices. However, some caveats may limit the findings of these studies, in particular both studies only partially control for additional factors that might impact respondents' moral attitudes.

Compared to the first stream of research, studies within the second stream of research are more homogeneous with respect to the research setting. These studies focus on business students' moral awareness and sensitivity, moral development and moral judgment or personal ethics and typically rely on well-established psychological measurement approaches. The main research interest regards the potential impact of (business) ethics education on students' moral attitudes. Researchers in this area do not investigate the self-selection and the treatment effect of economics and business studies in general, but usually focus on ethical courses and their impact on business students' moral attitudes relative to a control group. As results from these studies are mixed (Lau (2010) for a brief overview) the debate is moving away from investigations of the pure impact of business ethics education towards investigations on how to optimally design business ethics education (Gu and Neesham 2014; Martinov-Bennie and Mladenovic 2015; Neesham and Gu 2015). Lind (2015a) argues that a learning environment that provides opportunities for responsibility-taking (not role-playing) and guided reflection can foster students' moral development. The importance of a favorable learning environment for students' moral development is supported by Schillinger (2006). Moreover, based on an experiment with 81 students, Neesham and Gu (2015) show that only moral-identity-focused teaching, but not rule-based teaching, can enhance students' moral judgment intensity. Our study contributes to this on-going debate by shifting the focus of inquiry from a course-based focus back to a broader investigation of the self-selection and the treatment effect in econom-

ics and business education with respect to students' moral judgment competence thereby providing a link between the two aforementioned streams of research. Moreover, our results provide a strong indication that irrespective of the field of study, the universities' curriculum is not able to enhance moral competences, thereby strengthening the results that highlight the relevance of the learning environment rather than the curriculum content itself.

2. *Moral Development*

We draw on Kohlberg's (1969) six-stage scheme of CMD. Kohlberg (1964, p. 425) defines MJC as "the capacity to make decisions and judgments which are moral (i.e., based on internal principles) and to act in accordance with such judgments." According to this definition, MJC thus involves recognizing one's own complex, conflicting moral feelings, submitting those feelings to reflective reasoning, and entering into an ethical discourse with friends, experts, and authorities. This definition reflects two aspects of moral behavior: affective and cognitive mechanisms. According to Piaget's (1932/1965) initial conceptualization of these mechanisms, "affective and cognitive mechanisms are inseparable, although distinct: the former depends on energy, and the latter depends on structure." Affective mechanisms reflect moral ideals and principles, whereas cognitive mechanisms refer to a person's capacity to consistently apply these ideals and principles in his/her decision making. Kohlberg (1964; 1969) delineates six stages of moral judgment that are grouped into three major levels: pre-conventional (stages 1 and 2), conventional (stages 3 and 4) and post-conventional (stages 5 and 6) morality. At the pre-conventional level, individuals are concerned with obedience and self-interest; at the conventional level, individuals orient toward the expectations of others (their peer groups and society); and at the post-conventional level, individuals are geared toward universal ethical principles that are above the rules and expectations of others.

Rest (1983) and Lind (2008) extend Kohlberg's (1969) stage-development model by explicitly addressing (and measuring) the affective and cognitive components or aspects of moral behavior. The dual-aspect theory developed by Lind (2008) refers to the integration of both the affective and the cognitive aspects of moral behavior. According to Lind (2015b), "a full description of a person's moral behavior involves a) the moral ideals and principles that inform it, and b) the cognitive capacities that a person has when applying these ideals and principles in his or her decision-making processes." Only a combined analysis of both aspects of morality provides a comprehensive description of an individual's moral behavior.

Past research has shown that MJC is positively related to moral behavior (Trevino 1992; Church et al. 2005; Brown and Trevino 2006). For example, only 13% of Milgram's subjects who reasoned at stages 1–4 refused to administer shocks when the experimenter ordered them to continue, and 75% of those who reasoned at stages 5–6 refused to continue (Sprinthall and Sprinthall 1987). In another experiment, 75% of stage 5 subjects offered help to a stranger, whereas only 38% of stage 4, 27% of stage 3, and 9% of stage 2 subjects did so (McNamee 1977). Furthermore, research confirms a strong relationship between higher-stage reasoning and altruistic behavior, i.e., resistance to following the crowd, indicating that social influence is more salient at lower than at higher stages (Blasi 1980).

However, Kohlberg's theory of CMD has been criticized for its strong emphasis on cognitive aspects and disregard for emotional aspects of moral decision making (Narvaez 2010). Indeed, while judgment is an important competence driving moral behavior, other competences, such as recognition of the moral issue as well as moral intent and the characteristics of the moral issue, also drive moral behavior (Jones 1991). Moreover, according to the concept of moral intelligence, "having a moral compass (beliefs about what is the right thing to do) and a set of four main competences (moral commitment, moral sensibility, moral problem solving

and moral resoluteness)” are all required to manage ethical issues in the workplace (Tanner and Christen 2014, p. 135). Although we confess that moral motivation is likely an “over-arching component in the multi-stage model of moral decision-making, with implications for all other components” (Tanner and Christen 2014, p. 128), we nevertheless focus on MJC in our empirical analysis for two reasons. First, and most important, we use the Moral Competence Test (MCT, previously known as the Moral Judgment Test) to quantitatively measure moral development, as this test was developed by prominent researchers and validated worldwide in different settings. The test does, however, primarily rely on MJC and not, for example, on emotional aspects of moral behavior. Second, we assume that a potential negative impact of economics and business education should be most strongly reflected in judgments and only weakly in emotional aspects of moral decision making.

3. *Hypotheses on the Self-Selection and the Treatment-Effect*

With respect to the *self-selection effect*, a substantial number of previous studies find differences between economists and non-economists (Frey et al. 1993; Cipriani et al. 2009; Neubaum et al. 2009). Self-selection processes are typically attributed to personal characteristics. For example, it is sometimes argued that students choose to study economics and business because they are already different from other students with respect to their MJC. For some study fields, e.g., medicine, philosophy, or ethics, this assumption may be true. However, self-selection can also be caused by spurious correlations. For example, MJC is correlated with levels of cognitive capacities, political attitudes, religiosity, wealth, or study motivation (Lind 2008), and all of these variables also drive the self-selection of students into different fields of study. For a precise investigation of the treatment effect, we need to consider the self-selection effect in our study. However, since a convincing theory for the self-selection of

economists with respect to MJC remains elusive, we do not expect to find a significant self-selection effect for economics and business students with respect to their moral development.

Hypothesis H1: There is no self-selection effect of economics and business students with respect to their moral development. At the beginning of their university education, students who decide to study economics and business show the same degree of moral development when compared to students who decide to study other disciplines such as science, medicine, arts, law or theology.

An examination of the *treatment effect* addresses the claim that management education has a negative impact on students' MJC. The arguments underlying this claim primarily focus on the content of economics and business education, namely, the propagation of ideologically inspired 'amoral' theories, such as agency theory, transaction cost theory, or game theory (Ghoshal 2005, pp. 75-76). However, all of these theories represent methodologies for comparing and assessing contractual designs in terms of efficiency, not moral aspects of decision making or contractual designs. Therefore, whether these theories can provide instruments or guidelines for solving moral dilemma problems is questionable. Furthermore, critics of business education and Ghoshal (2005) in his provocative article do not explain the underlying causal mechanisms that lead to the declining moral responsibility of business students. Yet the learning environment that influences moral development must be understood before the treatment effect of business education can be postulated.

According to moral development theory, situations that create cognitive conflict around moral issues promote moral development (Dawson 1994). Cognitive conflict "causes the subject to go beyond his current state and strike out in new directions" (Piaget 1985, p. 10); i.e., it induces actors to engage in morally thinking in more structurally complex ways than they normally do and thus creates disequilibrium in particular equilibration problems. Hence, ex-

isting cognitive schemes and subsystems must be altered to integrate an objective or event, i.e., knowledge must be *accommodated* through the creation of new cognitive structures, in order for moral development to occur. In contrast, situations in which the learner *assimilates* new knowledge into existing cognitive schemes and structures do not promote moral development.

Thus, only environments that produce cognitive conflict can foster moral development. Such environments include (a) exposure to moral reasoning just beyond the student's structural complexity (Kohlberg 1987); (b) participation in moral discussion, including discourses about hypothetical and real-life moral dilemmas (Garrod 1989); (c) involvement in altruistic activities such as community service or peer tutoring (Berman 1990; Brooks and Kann 1993); and (d) participation in communities of cooperation characterized by democratic forms of conflict resolution and decision making and an atmosphere of mutual caring and respect (Kohlberg and Mayer 1972; Schaps and Solomon 1990).

From this point of view, whether the exposure to economic theories and methodologies for comparing and assessing contractual designs produces cognitive conflict that can, in turn, foster or hinder students' moral development seems questionable. Instead, abstract economic theories, such as agency or game theory, may give the learner the option of assimilating new knowledge into existing cognitive schemes and structures. Therefore, we postulate that business education in itself does not affect students' MJC. Furthermore, moral development theory suggests that independent of the specific study content, it is the broader learning environment in universities – and thus also in business courses – that fosters or hinders moral development. This reasoning is also supported by the mixed empirical findings provided in the business ethics literature. Consequently, in contrast to Ghoshal's (2005, p. 75) reasoning of "bad management theories [...] destroying good management practices," we do not expect to

find a systematic negative impact of economics and business education on students' moral development.

Hypothesis H2: There is no treatment effect of economics and business education with respect to students' moral development. The moral development that occurs between the beginning and the end of studies is not different between students who study economics and business and students who study other disciplines.

III. RESEARCH DESIGN

1. *Sample and Survey Design*

At the beginning of the fall semester 2013, we surveyed 3,155 bachelor's and master's students who were enrolled in various study subjects at an AACSB-accredited large public university in Switzerland. During the first three weeks of the semester, we visited bachelor's and master's courses that covered six faculties: the Faculty of Theology, the Faculty of Law, the Faculty of Economics and Business, the Faculty of Medicine, the Faculty of Arts, and the Faculty of Science. Thus, our study covers a broad range of study subjects that serve as our control groups. At the bachelor's level, we concentrated on lectures that are mandatory and distinctly recommended to be accomplished in the first semester of study. To investigate the treatment effect, we concentrate on master's students at the beginning of their education rather than bachelor's students at the end of their education because of a few practical considerations. First, most study programs focus on the thesis at the end of bachelor's education, yet surveying students who are writing their theses is difficult. Second, although there is a very high dropout rate among students within the first two semesters of their bachelor's education, in the Swiss education system, most students with a bachelor's degree directly continue with their master's education. This tendency is a consequence of the previous diploma study sys-

tem before the Bologna reform was introduced. In the view of most students, a bachelor's degree is only a pre-study degree because the diploma took on average five years, that is, the same amount of time as both bachelor's and master's education.¹

At the end of the lecture, students were asked to complete a paper and pencil questionnaire on a voluntary basis.² In addition to questions on demographic data, education and study area, and personal details, the main part of the questionnaire consists of the MCT, which is used to measure our main variable of interest and is described in detail in the next section. We explicitly noted the voluntary nature of the survey and did not offer any incentives to complete the questionnaire. Because of the survey's nature, quantifying the original survey sample is difficult. Based on the number of places in lecture halls and lecturers' experience (N=3,500), we estimate a response rate of about 90%. This rather high rate is modified by 881 questionnaires that had to be excluded from our dataset because of incomplete responses. Thus, the estimated final response rate is approximately 65%, with a maximum of 85% (Faculty of Medicine) and a minimum of 60% (Faculty of Theology). This response rate is even higher than that in similar studies, such as that by Neubaum et al. (2009, p. 14), who report an estimated response rate of approximately 53%. In total, our sample comprises 1,773 bachelor's and 501 master's students. The variables included in our analysis are summarized in Table 1 and described in detail in the section 'Control Variables'.

¹ For instance, in the Faculty of Economics and Business, approximately 70% of the bachelor's students directly continue with their master's education, and in the Faculty of Law and the Faculty of Medicine, nearly all students continue with their master's education because bachelor's degrees in law or medicine do not qualify one to practice.

² We conducted a pretest with 162 students across different courses of studies in the fall semester of 2012 to check the duration and comprehensibility of the questionnaire. Based on the results from this pretest, we adjusted and rephrased some questions to enhance students' ability to understand and complete the questionnaire.

Insert Table 1 about here

2. *Measurement of Moral Judgment Competence*

MJC is measured by using the MCT developed by Lind (2008) and indexed by the *C-score*. The *C-score* measures the cognitive mechanisms of MJC; i.e., it refers to a person's capacity to consistently apply these ideals and principles in his/her decision making. Alternative tests are the Moral Judgment Interviews provided by Kohlberg (1981) and the Defining Issues Test (DIT) provided by Rest (1975). All of these tests draw on Kohlberg's (1969) six-stage scheme of CMD, use moral dilemmas, and receive widespread use in research on MJC as well-established instruments. We chose the MCT because it predominantly targets the consistency of moral judgment rather than the preferred stages of moral reasoning, and it therefore predominantly measures the cognitive aspects of moral behavior. Moreover, previous studies have shown that – in contrast to the DIT³ – results from the MCT cannot be manipulated by respondents (Yussen 1976; Emler et al. 1983; Lind 2000/2003).

The MCT is based on two moral dilemma situations (Lind 2008). A moral dilemma is a situation that requires a choice between two or more obligations. Each choice is linked to undesirable side effects, resulting in a conflict between moral decision making and moral outcomes. Thus, each solution leaves the decision-maker with 'guilt and remorse'. In the MCT, both the moral dilemma and the protagonist's action are described. The study participants indicate whether they agree or disagree with the protagonist's action in these situations and rate their degree of acceptance with six pro and six con arguments about the protagonist's action. Each

³ Yussen (1976) reports evidence that DIT scores can be manipulated upward by respondents. Similarly, Emler et al. (1983) report differences in DIT scores when respondents are asked to fill in the questionnaires from political extreme perspectives.

argument refers to one of the six stages of Kohlberg's (1981) CMD. Lind (2008) argues that the cognitive aspect of moral judgment is especially stimulated when individuals are asked to rate arguments that are contrary to their own positions. Therefore, the overall score of MJC, i.e., the *C-score*, assesses the consistency in respondents' moral reasoning across situations and their opinion conformity, i.e., pro-con arguments. The *C-score* is computed by multivariate analysis of variance (MANOVA), and it can hypothetically range from zero (lowest score) to 1.0 (highest score), which indicates the percentage of an individual's total response variation that is attributable to concern for the moral quality of the presented arguments or behavior (Lind 2008). Lind (2008) suggests a four-level classification for the *C-score*: low (.01-.09), medium (.10-.29), high (.30-.49), and very high (above .50).

In addition to the measurement of stage consistency as indexed by the *C-score*, the MCT also allows for the measurement of moral attitude and stage preferences. We use stage preference (*Stage*) as an alternative measurement for moral judgment competence in the robustness section. Stage preference measures affective mechanisms of moral judgment competence, i.e., it reflects moral ideals and principles. Moral attitude (*M_ATTITUDE1* to *M_ATTITUDE6*) measures respondents' attitudes toward each of the six stages of Kohlberg's (1981) CMD scheme and is calculated as the sum of the levels of acceptance across pro and con arguments in both dilemma situations for each stage of moral development. Stage preference (*Stage*) refers to the stage with the maximum value of moral attitude, i.e., *Stage=1* implies that the maximum value of moral attitude is defined by *M_ATTITUDE1*.

3. *Measurement of the Self-Selection and the Treatment Effect*

We test our hypothesis based on the following regression model:

(equation 1)

$$C\text{-score} = \beta_0 + \beta_1 * \textit{Science} + \beta_2 * \textit{Medicine} + \beta_3 * \textit{Arts} + \beta_4 * \textit{Law} + \beta_5 * \textit{Theology} + \beta_6 * \textit{Master} \\ + \beta_7 * \textit{Science} * \textit{Master} + \beta_8 * \textit{Medicine} * \textit{Master} + \beta_9 * \textit{Arts} * \textit{Master} + \beta_{10} * \textit{Law} * \textit{Master} + \\ \beta_{11} * \textit{Theology} * \textit{Master} + \sum \beta_i * \textit{Control Variables}_i + \varepsilon$$

The dependent variable is MJC, which is indexed by the *C-score*. *Science*, *Medicine*, *Arts*, *Law*, and *Theology* are dummy variables indicating whether the respondent is enrolled in one of those faculties. Our reference group is enrollment in the Faculty of Economics and Business; i.e., if all dummy variables equal ‘0’, the respondent is an economics and business student. The variable *Master* equals ‘1’ if the respondent is pursuing a master’s education and ‘0’ if the respondent is pursuing a bachelor’s education. The regression model enables us to assess both the self-selection and the treatment effect by applying a difference-in-differences design. This design is appropriate for our research question because it allows us to properly disentangle the self-selection and treatment effects, i.e., to compare the effects of economics and business education on MJC relative to the effects of education in other study areas.

Self-Selection Effect. For bachelor’s students, the regression coefficients β_1 to β_5 measure whether students who select into the Faculty of Economics and Business have different MJC compared with students who select into the Faculties of Science, Medicine, Arts, Law, or Theology. For instance, β_1 measures the self-selection effect of *Science* students compared with Economics and Business students. Significant positive (negative) regression coefficients β_1 to β_5 indicate the existence of a negative (positive) self-selection effect, i.e., bachelor’s students enrolled in the Faculty of Economics and Business have significantly lower (higher) MJC at the beginning of their studies than do bachelor’s students enrolled in other faculties.

Treatment Effect. For master's students, the regression coefficients β_6 to β_{11} measure whether an education in the Faculties of Economics and Business, Science, Medicine, Arts, Law, or Theology has an impact on students' MJC. The regression coefficient β_6 measures the education effect of studying economics and business. The sum of the regression coefficients β_6 and β_7 to β_{11} measures the education effect of studying science, medicine, arts, law, and theology. The regression coefficients β_7 to β_{11} measure whether the education effect of studying science, medicine, arts, law, and theology is significantly different from the education effect of studying economics and business. Thus, these regression coefficients correspond to relative treatment effects. For instance, β_7 constitutes the difference-in-differences estimator for *Science* and corresponds to the relative treatment effect of studying *Science* compared with studying *Economics and Business*.

A significant negative (positive) regression coefficient β_6 indicates a negative (positive) treatment effect of bachelor's education in economics and business on the MJC of economics and business students. In line with our hypothesis, we would expect to find a nonsignificant coefficient β_6 . Vice versa, significant negative (positive) regression coefficients $\beta_6+\beta_7$, $\beta_6+\beta_8$, $\beta_6+\beta_9$, $\beta_6+\beta_{10}$, and $\beta_6+\beta_{11}$ indicate a negative (positive) treatment effect of bachelor's education in science, medicine, arts, law, and theology on the MJC of science, medicine, arts, law, and theology students. Finally, significant negative (positive) regression coefficients β_7 , β_8 , β_9 , β_{10} , and β_{11} indicate a negative (positive) treatment effect of bachelor's education in science, medicine, arts, law, and theology compared with bachelor's education in economics and business on students' MJC. The regression coefficients β_7 , β_8 , β_9 , β_{10} , and β_{11} correspond to our treatment effect of main interest, as they enable us to compare the effects of education in different study areas relative to the effects of economics and business

education. Simply referring to the pure effects of education in these different study areas (i.e., β_6 , $\beta_6+\beta_7$, $\beta_6+\beta_8$, $\beta_6+\beta_9$, $\beta_6+\beta_{10}$ and $\beta_6+\beta_{11}$) would not properly disentangle the self-selection effect from the treatment effect because significant findings might stem from significant differences in education between these study areas.

4. *Control Variables*

In addition to our main variables of interest, we use a number of control variables that previous research has identified as determinants of MJC and that may be correlated with self-selection into a study field.

Age. Moral judgment is often argued to develop through progressive stages and hence to be closely related to *age* (Piaget 1932/1965; Kohlberg 1964; 1969; Rest 1983). However, a positive relationship exists only up to a certain *age*, particularly from childhood up to adolescence (Lind 2008).

Gender. Previous research predominantly indicates that female students have higher levels of ethical standards and reasoning than male students (Borkowski and Ugras 1998). For instance, Tse and Au (1997) find that female students are significantly more ethical than male students, and Rubinstein (2006) and Cipriani et al. (2009) find that women show more compassionate behavior than men. With respect to MJC, however, empirical results are ambiguous (for an overview see Lind et al. 1986).

Parental Education. Moral development theory suggests that education—both at home and at educational institutions—can foster moral development by enabling learning environments (Schlaefli et al. 1985). For instance, Walker and Taylor (1991) show that parents have a critical impact on their children's moral development. In particular, contact with persons with higher levels of moral development can positively influence a child's moral development.

Further, Lupu (2009) and Schillinger (2006) provide empirical evidence of a positive and significant correlation between the *C-score* and parents' level of education. We therefore include the educational background of the mother and father in our model.

Grade. We control for students' high school graduation mark as a proxy for their intellectual capacity (similarly used by Cipriani et al. 2009). Although Cipriani et al. (2009) find no significant impact of intellectual capacity on fairness perceptions in differently framed situations, Lind (2015a) reports a positive impact of students' high school graduation mark on their MJC based on a sample of 3,102 students from a German university.

Religiosity. We also control for religiosity as self-assessed by respondents on a 9-point scale ranging from '0' (not religious at all) to '9' (very religious). Previous research shows that religion encourages and reinforces particular traits and values, such as work ethic, honesty, trust, thrift, charity, risk aversion, and fairness beliefs (Shalvi and Leiser 2013). With respect to the impact of religiosity on ethical standards and on MJC, previous research finds no distinct impact of personal (in contrast to dogmatic) religiosity on MJC (Lupu 2009).

Political Attitude. We control for political attitude as self-assessed by respondents on a 9-point scale ranging from '0' (politically left oriented) to '9' (politically right oriented). Left-wing persons often fight for more fairness and equity than right-wing persons (Carlsson et al. 2005), and a number of empirical studies reveal significant correlations between moral development level and sociopolitical attitudes (Emler et al. 1983; Fisher and Sweeney 1998).

Income. We control for income measured as respondents' self-assessment of the monthly income at their disposal after all costs of living are deducted. Frey and Meier (2003) report a significantly positive impact of income on students' voluntary giving behavior. However, this effect is particularly related to the proxy for 'morality' in the study, as students with higher

income are inherently more capable of spending extra money voluntarily. With respect to students' ethical standards, there are no significant differences with respect to household income (Tse and Au 1997).

Study Motivation. Highly morally developed individuals use universally held principles such as justice and rights as guidelines for their moral evaluations (Kohlberg 1981). Therefore, such individuals should be more likely to choose a study topic based on internal motives such as personal interest and altruism, which are consistent with these principles, and not because of external motives such as status aspiration, which is inconsistent with these principles. We use nine items to measure work motivation and values for education choices (Kasser and Ryan 1993; Twenge et al. 2010). Based on the results from a principal component factor analysis, we derive three factors (based on eight of the initially nine items) that indicate personal interest, status, and altruism as the motivations for students' chosen study subjects to serve as control variables.

Education Outside. Treatment effects may be contaminated by a change of university. We therefore measure whether a master's student completed his/her bachelor's education at the sample university (=0) or elsewhere (=1).

Study Topic Change. Similarly, self-selection effects may be contaminated by study topic changes. Thus, for bachelor's students, we capture whether they had previously studied in another study field (=1) or not (=0).

IV. RESULTS

1. Descriptive Results

Table 2 reports the mean values and standard deviations of the *C-scores* by faculty for the full sample, subsample of female and male students, subsample of bachelor's students, subsample

of master's students, subsample of bachelor's students without previous study subjects, and subsample of master's students who completed their bachelor's education at the sample university. Compared with previous studies, the mean values of the C-scores are above the mean values reported for Rumanian, Brazilian and Iranian students (Schillinger 2006; Lupu 2009; Saeidi-Parvaneh 2011) yet substantially below the values reported for German students (Schillinger 2006; Lind 2015a). For the sample of all students and the subsample of bachelor's students, students of the Faculty of Theology exhibit the highest mean *C-score* (.29 and .29), whereas students of the Faculty of Economics and Business exhibit the lowest average *C-score* (.21 with respect to all students and .20 with respect to bachelor's students). This finding may indicate the existence of a self-selection effect. However, the *C-scores* of master's students in the Faculty of Economics and Business are slightly higher than those of the bachelor's students in this study area. This result can be interpreted as first evidence against a (negative) treatment effect of economics and business education. Interestingly, the lowest *C-score* for master's students is exhibited by medicine students, although students in this study area exhibit rather high values at the bachelor's level. With respect to gender, the descriptive statistics are mixed. More precisely, in the Faculty of Science, female students exhibit slightly higher levels of moral competence, whereas in the Faculty of Medicine and the Faculty of Arts male students show slightly higher levels in moral competence.

Insert Table 2 about here

Table 3 presents the descriptive statistics and bivariate correlations for the variables used in the regression analysis. Compared with that in similar investigations of MJC among universi-

ty students, the mean MJC level for our sample is rather low, at .23 (Schillinger 2006). Students are, on average, 22 years old, and 56% of our sample students are females. On average, the father's education background is high school graduation, and that of the mother is slightly lower. Respondents' average high school graduation mark is 4.88 on a scale between 4.00 (lowest) and 6.00 (highest). Students are, on average, not very religious and are slightly politically left oriented. Students' average monthly income equals 1.51, corresponding to a range between 500 CHF and 1,500 CHF. The correlation coefficients are all below .60, indicating no problems of multicollinearity. In addition, we examine the validity of our MJC measures based on the three criteria suggested by Lind (2008), and the results from our analyses clearly support these three criteria and thus the validity of our main variables of interest.⁴

Insert Table 3 about here

2. *Results from the Regression Analyses*

Table 4 documents the findings of the multivariate regression analyses for predicting students' MJC. We present stepwise regression models, beginning with our control variables and gradually introducing the self-selection and treatment effects. The results presented in Column IV correspond to our full model, i.e., equation 1.

Insert Table 4 about here

⁴ These three criteria include cognitive-affective parallelism, the quasi-simplex structure of stage correlations, and monotonous preference hierarchy.

Column I contains only the control variables. According to the findings, persons with higher intellectual capacity, proxied by their high school graduation mark, have significantly higher *C-scores*, supporting the notion that moral development is related to education. Cognitive capacity increases the ability to accommodate new knowledge, i.e., to alter existing cognitive knowledge structures. Furthermore, a weakly positive (.003) and significant relationship exists between religiosity and MJC, indicating that religiosity serves as a reliable orientation for assessing moral dilemma situations. However, religiosity becomes insignificant when we include our main variables of interest (Columns II, III and IV). The results further reveal a significant negative effect of political attitude on MJC, indicating that left-oriented persons have higher *C-scores*. Further, a significant negative relationship exists between income and MJC. This relationship may be explained by the greater amount of time that persons with higher incomes spend in a working context relative to a university context, implying that they are exposed to less discussion about abstract moral problems. Another explanation for this relationship could stem from the moral atmosphere in working institutions, i.e., the structure of the environment in which an individual works (Dawson 1994); this explanation is outlined in more detail in section 5. Regarding gender, the results suggest that male students have higher MJC. This result contrasts with the findings obtained by Tse and Au (1997), Rubinstein (2006), and Cipriani et al. (2009). The contradictory result may be explained by the potential gender bias of Kohlberg's theory, which is discussed in the literature (Gilligan 1982/1983). Finally, the results show that persons with strong extrinsic study motivation, measured by status as the motivation for choosing a specific study field, have lower MJC. This finding may be explained by extrinsically motivated persons tendency to satisfy their personal needs only indirectly (Ryan and Deci 2000); i.e., they tend to be less able to create intrinsic rewards through their study subjects. This lower self-motivation also may be reflect-

ed in less motivation to actively address moral conflict situations within subject topics and thus in less accommodation, i.e., less alteration of existing cognitive structures.

In Column II, we introduce the self-selection effects with respect to study fields. The MJC of economics and business students significantly differs from that of medical students and weakly differs from that of theology students. Both of these groups of students have systematically higher *C-scores* than do economics and business students. Controlling for several other factors, we find that the *C-scores* of students enrolled in the Faculty of Economics and Business is .04 lower than that of students in the Faculty of Medicine and .06 lower than that of students in the Faculty of Theology. However, we find no systematic differences between economics and business students and students of science, arts, and law. Therefore, the results reveal self-selection effects of economics and business students for some (e.g., medicine and theology) but not all (e.g., science, law, and art) fields of study. These results suggest that the MJC of economics and business students is neither exceptionally above nor exceptionally below average.

In Columns III and IV, we introduce the treatment effects. The results in Column III suggest that when other factors are controlled for, a bachelor's degree does not significantly increase students' MJC in general. This finding is a desolate testimonial for university education overall. It indicates that universities' educational environment—or at least that of the university studied in this research—neither sufficiently exposes students to moral models and higher-stage reasoning nor provides role-taking opportunities, encourages reflection upon one's and others' moral actions, or involves students in moral activities. The results with respect to the self-selection effect remain unchanged. Column IV presents the results of our full model, i.e., corresponding to equation 1. The results of the full model provide a more refined picture, indicating that some study fields are indeed associated with slightly higher *C-scores* and that

other study fields have strong reverse effects. Bachelor's education in medicine in particular seems to significantly reduce students' initially extraordinarily high MJC. This negative impact of medical education on students' MJC is also documented by other researchers (Dawson 1994; Helkama et al. 2003; Schillinger 2006), and these researchers explain this finding by the unfavorable learning environment of medical education, which discourages the use of highest-stage moral reasoning. In addition, the results demonstrate that there is no significant treatment effect on students' *C-scores* for any other field of study. A bachelor's degree in economics and business has a neutral effect on students' MJC (.00),⁵ and the same results are obtained for bachelor's degrees in science (-.01) and theology (.00). The only positive effects for bachelor's degrees (arts (.03) and law (.02)) are not significant, suggesting that there is no systematic influence of the study of arts or law on students' MJC. The results thus temporarily support hypothesis H2, suggesting that the study of economics and business has no treatment effect on students' MJC.

3. *Robustness Tests*

We perform several robustness tests to substantiate our results. First, we repeat the regression analyses of Table 4 by using stage preference (*Stage*) instead of stage consistency (*C-score*) as the dependent variable. This alternative measure of MJC is more closely related to the DIT and its measure 'P-score' (Ishida 2006). Stage preference measures the affective mechanisms of MJC and refers to the stage with the maximum value of respondents' moral attitude. Table 5 presents the results from the regression analyses of *Stage*.

⁵ Because of this neutral effect, there are no differences between pure and relative treatment effects for the different study fields.

Insert Table 5 about here

The results again show that students of theology are characterized by a preference for higher moral stages compared with students of economics and business. On average, theology students favor a .77 higher moral stage than do economics and business students (Column IV). In contrast to our initial model that uses the *C-score* as a dependent variable, we find no significant differences in stage preference for medical students compared with business students. Thus, the positive self-selection effect of medical students is obtained only for the cognitive but not the affective aspect of moral reasoning. With respect to the treatment effect, our findings suggest that the study of law increases students' MJC by .43 stages (pure treatment effect, i.e., $\beta_6 + \beta_{10}$). In contrast to the results based on the *C-score*, the results based on stage preference do not reveal a significant negative effect for the study of medicine. Thus, the negative treatment effect of medical studies applies to the cognitive aspect of moral reasoning but not to affective aspects of moral reasoning, which is in line with the findings for medical students reported by Lind (1997/2000). Taken together, the results again support our reasoning that there are no systematic self-selection effects of economics and business students compared to other fields of study and that the study of economics and business has no significant treatment effects on students' MJC, even though the effect on stage preference is weakly negative (-.10).

Next, we rerun the analyses of Table 4 by using fractional logit regressions (Papke and Wooldridge 1996; Kieschnick and McCullough 2003) since the *C-score* ranges from 0 to 1. The results (no tables) are nearly identical to our initial findings, yielding no differences with respect to our main findings. In addition, we repeat the regression analyses of Table 4 for a restricted sample consisting only of bachelor's students with no previous study experiences

and for master's students who completed their bachelor's education at the sample university. One may argue that the self-selection and treatment effects could be confounded by a change in study topic and/or university. The results (no tables) remain unchanged and confirm our main findings from Table 4. We also exclude respondents with an age above the 90th (75th) percentile within each faculty to test whether our reasoning that most bachelor's students directly continue with their master's education biased our findings. Again, the results remain unchanged with respect to both the self-selection and the treatment effect. We also check for systematic biases caused by nonresponse. Higher nonresponse rates by students in a faculty may accompany higher C-scores because those students who are interested in the survey may be more likely to complete the questionnaire and to have higher C-scores. However, the descriptive results do not support this presumption. Whereas the Faculty of Theology exhibits the highest nonresponse rate and the highest mean C-score, the Faculty of Medicine has the lowest nonresponse rate and the second highest C-score on average. In addition, we rerun the regression analyses with the full sample of 3,155 respondents while replacing missing values for each variable by the arithmetic mean of the variable by faculty. The results are nearly identical to our original findings. In particular, there are no differences with respect to our findings regarding both the self-selection and the treatment effect. Finally, we divide the sample into several subgroups, e.g., bachelor's vs. master's students, different study fields, and females vs. males. The results are consistent with our previous findings (no tables).

V. CONCLUSIONS

In view of the corporate ethical scandals and the global financial crisis that have shocked the world, economics and business programs have repeatedly been accused of actively contributing to the amoral decision making of some managers. Previous research reports mixed results with respect to both the self-selection effect (do economics and business students differ

a priori from other students with respect to MJC?) and the treatment effect (does an economics and business education have an impact on students' MJC?) of economics and business education. Because these studies predominantly concentrate on certain aspects of economists' attitudes and behavior and do not differentiate between the self-selection and the treatment effect, it is difficult to draw conclusions on the relationship between the *study* of economics and business and students' moral development. In addition, studies in the business ethics literature also report mixed findings on the impact of ethics courses on students' ethical decision-making (Craft (2013) for a recent literature review). Against the background of these mixed findings, our study applies the methodological rigor of business ethics studies to the investigation of the self-selection and the treatment effect.

We argue that economic theories represent methodologies for comparing and assessing contractual designs with regard to efficiency only. These theories give the learner the option of assimilating new knowledge into existing cognitive schemes and structures, but they do not alter existing cognitive schemes and subsystems. Consequently, we do not expect to find a significant self-selection and treatment effect for the studies of economics and business with respect to students' MJC. Our results, based on a sample of 1,773 bachelor's and 501 master's students across six different faculties, indicate that the study of economics and business has neither a self-selection nor a treatment effect on students' MJC in general. This finding supports our reasoning that economics and business education has no impact on students' MJC, and it is robust to a number of supplemental analyses and model variations. Moreover, we obtain similar results for almost all other study fields.

The findings from our study have both practical and academic implications. First, they are a first indication that economics and business education does not destroy “good management practices” (Ghoshal 2005, p. 75). However, this finding holds for not only economics and

business education but university education in general. Moreover, and probably most important, is the finding that university education in general does not foster students' moral development. To achieve higher levels of moral competence (similar to those obtained for master's students in Germany (Lind 2015a)), bachelor's education would need to generate a doubling in the average C-scores of our sample students. Our results report only a 0.01 increase in the average C-scores, which is a sobering outcome for university education in general.

Of course, future research must test whether this finding is robust and generalizable across other universities and countries. However, given the kinds of education offered in most universities, our findings will most likely be replicated in other empirical settings. Today's universities do not offer a learning environment in which optimal moral development can occur. To facilitate moral development, university teachers must encourage students to engage in problem solving rather than offering prepackaged solutions to moral problems. A good moral education program offers exposure to moral models, exposure to higher-stage reasoning, involvement in moral discussion, participation in group decision making, and altruistic activity (Power et al. 1989; Lind 2015a). Thus, moral education requires extremely intensive support and time. Because of the cost pressures at most universities in German-speaking countries, however, support and time are rare. Against this background, the finding that university education does not promote moral development is unsurprising. Second, the finding that an economics and business education does not diminish students' moral competence does not automatically imply that managers did not contribute to organizational failure during the financial crisis. They did – however, most likely not because of a deficient education but due to the “unethical climate” in these organizations (Soltani 2014). For instance, there is empirical evidence suggesting that pay-for-performance systems promote questionable accounting techniques and diminish prosocial behavior (Yermack 1997; Aboody and Kasznik 2000). There-

fore, not economics education but rather an amoral institutional atmosphere may have restrained individuals from functioning at their highest moral level.

The results of this paper are subject to certain limitations. First, similar to other related studies, we use a cross-sectional rather than a longitudinal panel study design for reasons of practicability and anonymity for the study respondents. By conducting the survey during the first three weeks of the semester and concentrating on mandatory (bachelor's) courses, we attempted to rule out potential biases caused by both the sampling method and the chosen time period of our study. Moreover, we are confident that any remaining confounding effects are captured by the substantial number of control variables which are included in the analyses. However, to investigate the treatment effect, we concentrate on master's students at the beginning of their education rather than bachelor's students at the end of their education because surveying students who are writing their theses is difficult. A comparison of first and last year students in both levels of study is a better basis for inferring education effects. Second, our study lacks an assessment of the learning environment, for example, opportunities for responsibility-taking and guided reflection, which has been shown to make a significant difference in moral learning (Lind 2015a). In our survey, these measurements were excluded to improve the response rate and to decrease self-selection effects. However, future research should explicitly include the learning environment to provide further insights and to test the robustness of our findings. Third, our measurement of MJC is based on Kohlberg's (1969) six-stage scheme of CMD and is measured by the MCT developed by Lind (2008). Although we are convinced that the MJC construct best fits the debate on responsible management education and overcomes the unilateral focus on economists' attitudes toward the fundamental economic principles of previous studies, the MCT is not free from criticism. In particular, the link between MJC and moral behavior may be strong, but it is not clearly without ambiguity

(Blasi 1980). Although we are confident that the MCT, with its focus on stage consistency rather than stage preference, is an appropriate measurement approach for the MJC construct, we know that our method cannot cover all elements of the set of moral competences. In this regard, readers must be very careful when interpreting the results – particularly when referring to the moral skills and intelligence of students. Fourth, for the empirical assessment of the self-selection and treatment effects, we employ a difference-in-differences design. We nevertheless cannot completely rule out concerns that the treatment effect may have been biased by the sample composition or by fundamental differences between treatment and control group. Finally, we did not focus on particular aspects of demographic and personal characteristics that may impact MJC but instead covered a broad range of potentially confounding aspects, in particular, age, gender, parental education, grade, religiosity, political attitude and study motivation. However, there are several characteristics, such as social class background or dogmatic and personal religiosity, which have a complex impact on moral competence. Clearly these aspects could and should be investigated in further research.

The open questions of our study provide opportunities for future research. Studies could employ a panel study design and analyze both the self-selection and the treatment effect across different universities. Whether our claim that university education does not promote moral development can be replicated in other settings would be interesting to determine. In this context, future research could analyze the underlying reasons, e.g., teaching programs or resources for student support, in more detail and examine whether and how accreditations with a special focus on business ethics may impact students' moral development. Another open research question refers to the integration of religious and theological principles into moral debates and how “religion’s prophetic voice” could be used as leverage for business ethics education (Calkins 2000). With respect to the claim that economic thinking destroys good

managerial practices, a closer examination of companies' moral atmospheres appears worthwhile. Employees may regress in their moral development if institutions restrain them from functioning at the highest moral levels. Moreover, the implementation of various high-performance work practices, i.e., human resource practices that aim to enhance firm performance (Huselid 1995), may have had such a negative effect; thus, further research should analyze the implementation of these work practices in this context.

TABLE 1. VARIABLE OVERVIEW

Variable	Description
<i>C-score</i>	level of moral judgment competence indicated by the <i>C-score</i> , measured as described in section 3.2
<i>Age</i>	age of the respondent, measured in number of years
<i>Gender</i>	gender dummy variable, equals '1' if the respondent is female and '0' otherwise
<i>Education Father</i>	highest education of the respondent's father; '1' refers to secondary school; '2' refers to apprenticeship; '3' refers to high school graduation (Matura); '4' refers to academic studies; '5' refers to doctoral/postdoctoral qualification
<i>Education Mother</i>	highest education of the respondent's mother; '1' refers to secondary school; '2' refers to apprenticeship; '3' refers to high school graduation (Matura); '4' refers to academic studies; '5' refers to doctoral/postdoctoral qualification
<i>Grade</i>	(Swiss) high school graduation mark, ranging from '4.0' (lowest) to '6.0' (highest)
<i>Religiosity</i>	respondent's self-assessment of religiosity, ranging from '0' (not religious at all) to '9' (very religious)
<i>Political Attitude</i>	respondent's self-assessment of his/her political attitude, ranging from '0' (politically left oriented) to '9' (politically right oriented)
<i>Income</i>	respondent's self-assessment of the monthly income at his/her disposal after all costs of living are deducted, ranging from '1' (<500 CHF) to '4' (>2,500 CHF)
<i>Personal Interest</i>	respondent's motivation for the chosen study subject measured as a factor obtained from the factor analysis of 9 items; the variable covers personal interest as motivation for the chosen study subject, and it is derived from the following two items measured on a five-point Likert-type scale ranging from '1' (not true at all) to '5' (very true): personal affection/ability and personal interest in the field of study.
<i>Status</i>	respondent's motivation for the chosen study subject measured as a factor obtained from the factor analysis of 9 items; the variable covers status as motivation for the chosen study subject, and it is derived from the following three items measured on a five-point Likert-type scale ranging from '1' (not true at all) to '5' (very true): expectation to earn a good deal of money, expectation to find a secure job, and the high reputation of the subject.
<i>Altruism</i>	respondent's motivation for the chosen study subject measured as a factor obtained from the factor analysis of 9 items; the variable covers altruism as motivation for the chosen study subject, and it is derived from the following three items measured on a five-point Likert-type scale ranging from '1' (not true at all) to '5' (very true): opportunity to serve the community, opportunity to help other people, and opportunity to contribute to social change.
<i>Education Outside Study Topic Change</i>	dummy variable, equals '1' if the respondent finished his/her bachelor's education at a different university from the sample university and '0' otherwise
<i>Master</i>	dummy variable, equals '1' if the respondent had changed study topics and '0' otherwise
<i>Master</i>	dummy variable, equals '1' if the respondent is pursuing a master's education and '0' if the respondent is pursuing a bachelor's education
<i>Economics and Business Science</i>	dummy variable, equals '1' if the respondent is enrolled in the Faculty of Economics and Business and '0' otherwise
<i>Science</i>	dummy variable, equals '1' if the respondent is enrolled in the Faculty of Science and '0' otherwise
<i>Medicine</i>	dummy variable, equals '1' if the respondent is enrolled in the Faculty of Medicine and '0' otherwise
<i>Arts</i>	dummy variable, equals '1' if the respondent is enrolled in the Faculty of Arts and '0' otherwise
<i>Law</i>	dummy variable, equals '1' if the respondent is enrolled in the Faculty of Law and '0' otherwise
<i>Theology</i>	dummy variable, equals '1' if the respondent is enrolled in the Faculty of Theology and '0' otherwise

TABLE 2. DESCRIPTIVE STATISTICS BY FACULTY

	Science	Medicine	Arts	Law	Theology	Economics and Busi- ness	Total
<i>All students</i>							
n	255	339	793	327	20	540	2274
Mean	.24	.27	.23	.23	.29	.21	.23
SD	.15	.16	.15	.15	.20	.14	.15
<i>Female students</i>							
n	114	199	560	197	15	180	1265
Mean	0.26	0.26	0.22	0.23	0.27	0.21	0.23
SD	0.15	0.15	0.15	0.14	0.21	0.14	0.15
<i>Male students</i>							
n	141	140	233	130		360	1009
Mean	0.23	0.28	0.25	0.23		0.21	0.23
SD	0.15	0.17	0.16	0.16		0.14	0.15
<i>Bachelor's students</i>							
n	167	289	704	223	10	380	1773
Mean	.24	.28	.23	.22	.29	.20	.23
SD	.14	.16	.15	.15	.23	.14	.15
<i>Master's students</i>							
n	88	50	89	104	10	160	501
Mean	.25	.19	.26	.24	.29	.22	.24
SD	.17	.12	.16	.14	.16	.15	.15
<i>Bachelor's students without previous study subjects</i>							
n	102	202	424	143		308	1183
Mean	.23	.29	.23	.22		.20	.23
SD	.15	.16	.15	.15		.14	.15
<i>Master's students who completed their bachelor's education at the sample university</i>							
n	62	48	79	87	10	85	371
Mean	.23	.19	.26	.24	.29	.20	.23
SD	.16	.13	.15	.14	.16	.15	.15

Note. This table presents the means and standard deviations of the *C-scores* for the full sample across different faculties.

Descriptive statistics are not displayed for subsamples of fewer than 10 students.

TABLE 3. DESCRIPTIVE STATISTICS AND CORRELATIONS FOR REGRESSION VARIABLES

Variable	Obs	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 <i>C-score</i>	2274	.23	.15	0	.83																				
2 <i>Age</i>	2274	21.81	4.04	17	74	-.03																			
3 <i>Gender</i>	2274	.56	.50	0	1	-.01	-.06																		
4 <i>Education Father</i>	2274	3.16	1.21	1	5	.07	-.05	-.01																	
5 <i>Education Mother</i>	2274	2.78	1.09	1	5	.07	-.06	.03	.44																
6 <i>Grade</i>	2274	4.88	.38	4	6	.12	.01	.09	.13	.12															
7 <i>Religiosity</i>	2274	2.47	2.38	0	9	.01	.02	.09	-.05	-.04	.01														
8 <i>Political Attitude</i>	2274	3.96	1.92	0	9	-.10	.00	-.17	-.03	-.06	-.02	.17													
9 <i>Income</i>	2274	1.51	.70	1	4	-.08	.25	-.10	.05	.05	.02	-.03	.09												
10 <i>Personal Interest</i>	2274	4.41	.65	1	5	.06	.03	.06	.03	.03	.10	-.04	-.08	-.02											
11 <i>Status</i>	2274	2.91	.93	1	5	-.14	-.10	-.13	-.02	.01	.01	.11	.26	.06	-.10										
12 <i>Altruism</i>	2274	3.32	1.03	1	5	.03	-.05	.13	.01	.02	.03	.12	-.19	-.08	.13	.01									
13 <i>Education Outside</i>	2274	.06	.23	0	1	.03	.17	-.05	.02	.04	.17	.03	.10	.00	-.04	.10	-.11								
14 <i>Study Topic Change</i>	2274	.26	.44	0	1	.01	.12	.02	.02	.03	-.06	-.03	-.06	.07	.05	-.12	.08	-.15							
15 <i>Master</i>	2274	.22	.41	0	1	.01	.42	-.07	-.01	.00	.17	-.01	.06	.08	-.02	.03	-.17	.46	-.31						
16 <i>Economics and Business</i>	2274	.24	.43	0	1	-.09	-.06	-.25	.00	.00	-.02	.01	.25	.11	-.21	.31	-.25	.20	-.16	.10					
17 <i>Science</i>	2274	.11	.32	0	1	.02	.09	-.08	.01	.01	.05	-.04	-.05	-.05	.08	-.12	-.08	.07	.00	.11	-.20				
18 <i>Medicine</i>	2274	.15	.36	0	1	.09	-.11	.03	.06	.07	.13	.03	-.03	-.13	.11	.09	.26	-.09	.00	-.07	-.23	-.15			
19 <i>Arts</i>	2274	.35	.48	0	1	.00	.03	.22	-.06	-.05	-.14	-.05	-.20	-.02	.11	-.35	.03	-.14	.16	-.19	-.41	-.26	-.31		
20 <i>Law</i>	2274	.14	.35	0	1	-.02	-.01	.04	.01	.00	.02	.01	.06	.06	-.10	.13	.05	-.01	-.01	.10	-.23	-.15	-.17	-.30	
21 <i>Theology</i>	2274	.01	.09	0	1	.04	.26	.04	.00	-.01	.03	.19	-.03	.04	.04	-.08	.07	-.02	.01	.06	-.05	-.03	-.04	-.07	-.04

Note. Table 3 presents descriptive statistics and correlation statistics (bivariate Pearson correlation coefficients) for the variables used in the regression analysis.

TABLE 4. RESULTS OF THE MULTIVARIATE REGRESSION ANALYSES OF *C-SCORE*

Y: C-score	Column I				Column II				Column III				Column IV			
	Coef.	Std.Err.	t	P> t	Coef.	Std.Err.	t	P> t	Coef.	Std.Err.	t	P> t	Coef.	Std.Err.	t	P> t
Intercept	.08	.05	1.61		.12	.05	2.33	**	.12	.05	2.30	**	.12	.05	2.35	**
Self-Selection Effect:																
<i>Science vs. Economics and Business</i>					.01	.01	.64		.01	.01	.64		.01	.01	.70	
<i>Medicine vs. Economics and Business</i>					.04	.01	3.56	†	.04	.01	3.56	†	.05	.01	4.01	†
<i>Arts vs. Economics and Business</i>					.01	.01	.68		.01	.01	.69		.00	.01	.28	
<i>Law vs. Economics and Business</i>					.02	.01	1.59		.02	.01	1.57		.01	.01	.90	
<i>Theology vs. Economics and Business</i>					.06	.04	1.72	*	.06	.04	1.72	*	.06	.05	1.25	
Treatment Effect:																
<i>Master</i>									.00	.01	.09		-.00	.02	-.05	
<i>Master in Science</i>													-.01	.02	-.21	
<i>Master in Medicine</i>													-.06	.03	-2.27	**
<i>Master in Arts</i>													.03	.02	1.41	
<i>Master in Law</i>													.02	.02	.73	
<i>Master in Theology</i>													.00	.07	.06	
Control Variables:																
<i>Age</i>	-.00	.00	-1.34		-.00	.00	-1.62		-.00	.00	-1.49		-.00	.00	-1.42	
<i>Gender</i>	-.02	.01	-2.81	***	-.02	.01	-2.85	***	-.02	.01	-2.85	***	-.02	.01	-2.67	***
<i>Education Father</i>	.01	.00	1.60		.00	.00	1.46		.00	.00	1.46		.00	.00	1.36	
<i>Education Mother</i>	.01	.00	1.53		.01	.00	1.41		.01	.00	1.41		.00	.00	1.36	
<i>Grade</i>	.05	.01	5.25	†	.04	.01	4.60	†	.04	.01	4.56	†	.04	.01	4.47	†
<i>Religiosity</i>	.00	.00	1.92	*	.00	.00	1.63		.00	.00	1.63		.00	.00	1.57	
<i>Political Attitude</i>	-.01	.00	-2.87	***	-.01	.00	-2.83	***	-.01	.00	-2.83	***	-.01	.00	-2.70	***
<i>Income</i>	-.02	.01	-3.39	†	-.01	.01	-2.88	***	-.01	.01	-2.88	***	-.01	.01	-2.90	***
<i>Personal Interest</i>	.01	.01	1.62		.01	.01	1.27		.01	.01	1.27		.01	.01	1.18	
<i>Status</i>	-.02	.00	-6.07	†	-.02	.00	-5.86	†	-.02	.00	-5.85	†	-.02	.00	-5.72	†
<i>Altruism</i>	.00	.00	.28		-.00	.00	-.83		-.00	.00	-.81		-.00	.00	-.81	
<i>Education Outside</i>	.02	.01	1.58		.03	.01	2.14	**	.03	.02	1.95	*	.03	.02	1.79	*
<i>Study Topic Change</i>	.00	.01	.22		.00	.01	.25		.00	.01	.26		.00	.01	.36	
Number of observations			2274				2274				2274				2274	
F-Value			9.9	†			8.14	†			7.71	†			6.63	†
Adjusted R-squared			.05				.05				.05				.06	

Note. This table reports ordinary least squares coefficient estimates, standard errors, and t-statistics. †, ***, **, and * indicate statistical significance at the 0.1%, 1%, 5%, and 10% levels (two-tailed), respectively.

TABLE 5. RESULTS OF THE MULTIVARIATE REGRESSION ANALYSES OF *STAGE*

<i>Y: Stage</i>	Column I				Column II				Column III				Column IV			
	Coef.	Std.Err.	t	P> t	Coef.	Std.Err.	t	P> t	Coef.	Std.Err.	t	P> t	Coef.	Std.Err.	t	P> t
Intercept	3.32	.47	7.10	†	3.48	.48	7.22	†	3.63	.49	7.40	†	3.65	.49	7.40	†
Self-Selection Effect:																
<i>Science vs. Economics and Business</i>					.10	.11	.91		.10	.11	.88		.03	.13	.20	
<i>Medicine vs. Economics and Business</i>					.13	.11	1.18		.13	.11	1.17		.07	.12	.58	
<i>Arts vs. Economics and Business</i>					.07	.09	.79		.08	.09	.90		.02	.10	.16	
<i>Law vs. Economics and Business</i>					.30	.10	3.02	***	.29	.10	2.85	***	.13	.12	1.10	
<i>Theology vs. Economics and Business</i>					.69	.34	2.03	**	.71	.34	2.08	**	.77	.46	1.68	
Treatment Effect:																
<i>Master</i>									.15	.10	1.61		-.10	.16	-.61	
<i>Master in Science</i>													.25	.23	1.10	
<i>Master in Medicine</i>													.22	.26	.85	
<i>Master in Arts</i>													.28	.21	1.35	
<i>Master in Law</i>													.53	.22	2.49	**
<i>Master in Theology</i>													.01	.64	.01	
Control Variables:																
<i>Age</i>	-.00	.01	-.25		-.01	.01	-.82		-.01	.01	-1.46		-.01	.01	-1.44	
<i>Gender</i>	-.09	.06	-1.45		-.11	.06	-1.71	*	-.11	.06	-1.69	*	-.11	.06	-1.67	*
<i>Education Father</i>	.04	.03	1.57		.04	.03	1.48		.04	.03	1.49		.04	.03	1.51	
<i>Education Mother</i>	.07	.03	2.29	**	.07	.03	2.29	**	.07	.03	2.28	**	.07	.03	2.30	**
<i>Grade</i>	.17	.08	2.21	**	.15	.08	1.93	*	.14	.08	1.74	*	.14	.08	1.77	*
<i>Religiosity</i>	-.02	.01	-1.34		-.02	.01	-1.61		-.02	.01	-1.57		-.02	.01	-1.63	
<i>Political Attitude</i>	-.05	.02	-2.81	***	-.05	.02	-2.75	***	-.05	.02	-2.73	***	-.04	.02	-2.62	***
<i>Income</i>	-.10	.04	-2.23	**	-.09	.04	-2.14	**	-.09	.04	-2.11	**	-.09	.04	-2.07	**
<i>Personal Interest</i>	.14	.05	2.96	***	.14	.05	2.94	***	.14	.05	2.91	***	.14	.05	3.00	***
<i>Status</i>	-.12	.03	-3.47	†	-.12	.04	-3.26	***	-.11	.04	-3.20	***	-.11	.04	-3.22	***
<i>Altruism</i>	.07	.03	2.33	**	.05	.03	1.70	*	.06	.03	1.87	*	.06	.03	1.81	*
<i>Education Outside</i>	.29	.13	2.18	**	.34	.13	2.52	**	.25	.15	1.73	*	.33	.15	2.18	**
<i>Study Topic Change</i>	.03	.07	.37		.03	.07	.39		.07	.07	.94		.08	.07	1.07	
Number of observations			2274				2274				2274				2274	
F-Value			6.98	†			5.77	†			5.61	†			4.71	†
Adjusted R-squared			.03				.04				.04				.04	

Note. This table reports ordinary least squares coefficient estimates, standard errors, and t-statistics. †, ***, **, and * indicate statistical significance at the 0.1%, 1%, 5%, and 10% levels (two-tailed), respectively.

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