DO HIGHER ACHIEVERS CHEAT LESS? AN EXPERIMENT OF SELF-REVEALING INDIVIDUAL CHEATING

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Abstract: The extensive body of economic and psychological research correlating between students' cheating and their grade point average (GPA) consistently finds a significant negative relationship between cheating and the GPA. However, this literature is entirely based on students' responses to direct-question surveys that inquire whether they have ever cheated on their academic assignments. The present paper reports the results of a two-round experiment designed to expose student cheating at the individual level and correlate it with their GPAs. The experiment involved two classes of third-year economics students incentivized by a competitive reward to answer a multiple-choice trivia quiz without consulting their electronic devices. While this forbiddance was deliberately overlooked in the first round, providing an opportunity to cheat, it was strictly enforced in the second, conducted two months later in the same classes with the same quiz. A comparison of subjects' performance in the two rounds, self-revealed a considerable extent of cheating in the first one. Regressing the individual cheating levels on subjects' gender and GPA exhibited no significant differences in cheating between males and females. However, cheating of both genders was found to significantly increase with their GPA, implying, in sharp contrast with the direct-question surveys, that higher achievers are bigger cheaters.

Keywords: Experimental Data; Cheating Behavior; Academic Achievemen

I. INTRODUCTION

Over the past two decades, behavioral economists and social psychologists have been designing numerous lab and field experiments with the purpose of deriving insights on students' (as a proxy to common people's) tendency to cheat, incentivizing subjects with monetary payoffs. While there is a wide variety of cheating experiments reported in the literature,1 the most prominent genre involves a simple task performed by subjects in privacy, such as flipping a coin (e.g., Bucciol and Piovesan, 2011; Houser et al, 2014), rolling a die (e.g., Fischbacher and Foellmi-Heusi, 2013; Arbel et al, 2014) or finding pairs of numbers that add up to 10 in as many matrices as possible (e.g., Mazar et al, 2008; Grolleau et al, 2014), the outcome of which they are requested to honestly self-report. Being informed about the payoffs associated with each possible outcome, subjects may opt to cheat on their report in favor of the better rewarded outcomes. While experimenters are unable to identify individual cheaters beyond reasonable doubt, they can elucidate the aggregate level of cheating among subjects as a group. In the coin-flipping and die-rolling experiments, this is done by comparing the reported outcomes to the statistical distribution of the possible outcomes (50% for heads or tails of a fair coin; 16.7% for each side of a fair die). In the matrix task experiment, the average outcome reported is compared to that of a control treatment where subjects' performance is verified by the experimenters rather than self-reported.

There is an extensive body of economic and psychological research correlating between students' cheating and their grade point average (GPA). This literature, which is based on students' responses to direct questions regarding whether they have ever cheated on their academic assignments, consistently finds a significant negative relationship between cheating and the GPA (e.g., Bunn et al, 1992; Nowell and Laufer, 1997; Crown and Spiller, 1998; Roig and Caso, 2005; Teixeira and Rocha, 2010). As Bushway and Nash (1977) conclude, "the majority of studies indicate

1 For a detailed review of the experimental literature on cheating see Rosenblum et al (2014).

that students who are lower in school achievement may cheat more frequently" (p. 624). To the best of our knowledge, there is no experimental study that has attempted to examine the relationship between cheating and the GPA. To do so, one must be able to identify cheating at the individual level. We know of only two studies that have done this. Ward and Beck (1990) informed 128 students who took a multiple-choice midterm exam a few days earlier

that due to time pressures examiners had not been able to grade their exams, therefore returning the exams to them for self-grading. Subjects' self-grading was then compared with their actual scores to reveal cheating. Schwieren and Weichselbaumer (2010) asked 65 students to solve, under competitive and non-competitive settings, as many mazes as they could in a maze game offered on Yahoo's website and record their achievements in a table. Subjects' records were then compared with the number of mazes actually solved using a spy-ware program that secretly monitored subjects' performance.

The present paper reports the results of a two-round experiment designed to expose student cheating at the individual level and correlate it with their GPAs. The experiment involved two classes of third-year economics students incentivized by a competitive reward to answer a multiple-choice trivia quiz without consulting with their electronic devices. While this forbiddance was deliberately overlooked in a first round, providing an opportunity to cheat, it was strictly enforced in the second, conducted two months later in the same classes with the same quiz. A comparison of subjects' performance in the two rounds, self-revealed a considerable extent of cheating in the first one. Regressing the individual cheating levels on administrative data of subjects' gender and GPA exhibited no significant differences in cheating between males and females. However, cheating of both genders was found to significantly increase with their GPA, implying, in sharp contrast with the direct-question surveys, that higher achievers are bigger cheaters.

II. THE EXPERIMENT

The experiment involved two rounds. In the first round, we asked two classes of third-year economics students at COMAS (Israel) to answer a trivia quiz of 16 multiple-choice questions. More specifically, each question of the quiz introduced the name of a certain country followed by the names of four cities, one of which was the capital city of that country. The students' task was simply to circle, in each question, the name of the appropriate capital city. The task was not trivial as it may sound, as most of the countries included in the quiz were relatively newly founded, the names of which (not to say the names of their capital cities) subjects had possibly never heard before (see Appendix A).

We asked subjects to write their student identification number at the top of the answer sheet and announced that the 10 subjects to do best in the quiz would be rewarded with a bonus of 5 points to their course grade. We made it clear that the reward reflected our appreciation for personal knowledge, hence subjects were to avoid using their electronic devices (i.e., smart-phones and laptops) in search for the correct answers. We gave subjects 10 minutes to answer the quiz and left them with a research assistant who deliberately appeared to be deeply engaged with his own smart-phone rather than paying attention to others, thereby providing an opportunity for cheating. In particular, subjects who happened to click "capitals of the world" in Google, rather than searching for one country at a time, got several links to lists of capital cities by country's alphabetical order and could easily end up answering correctly all 16 questions in just a few minutes.

In the second round, conducted two months later, we gave the same two classes the same quiz (though in a different order of questions and answers to blur possible visual memory of their order in the first round), promising the same reward. Only this time, two of us stayed in each class to carefully watch subjects, one in front and one in the back, thereby disabling them from activating their electronic devices. Using student identification numbers to compare their performance in the two rounds, we were able to expose their extent of cheating in the first round on an individual level without identifying them by name or face.2 Finally, providing our secretariat with a list of the identification numbers of students who participated in both rounds, we asked them to write down aside each number the student's GPA as well as his/her gender. We were then able to match the experimental data on individual

2 Notice that the order of the two rounds was crucial in attributing the entire difference in performance to cheating. Had we started with the strict enforcement round, the better performance in the second could have partly been the result of efforts taken by subjects, feeing ashamed with the poor knowledge they exhibited, to get acquainted with the newly founded countries.

cheating with the administrative data on their gender and academic achievement.

III. RESULTS

We collected a total of 145 answer sheets in the first round of the first experiment and 135 in the second round. Comparing student identification numbers, we sorted out 125 pairs of answer sheets corresponding to 125 students who participated in both rounds. Tables 1 and 2 display their performance in the two rounds. As shown in Table 1, performance fell dramatically in the second round with subjects' failure to activate their electronic devices: the average number of correct answers dropped by 50 percent, from 9.74 to 4.85, the difference in averages being statistically significant ($t = 11.51$, p-value < 0.0001). Of particular interest is the finding that 58 subjects (44.8

Table 1: Distribution of Correct Answers (First Experiment) percent) answered correctly more than 10 questions in the first round, whereas only two subjects (1.6 percent) succeeded in doing so in the second. Furthermore, Table 2 points out that 36 subjects (28.8 percent) exhibited a difference of at least 10 correct answers between their performance in the two rounds.

Table 3 presents the results of regressing subjects' cheating levels, as manifested by the differences in their correct answers, on their gender and GPA. While the effect of gender on cheating is not statistically significant, the effect of GPA is and positive. Specifically, an increase of 10 points in GPA increases cheating by 4.18 (fraudulently obtained) correct answers. The conclusion is somewhat frustrating but unequivocal: higher achievers are bigger cheaters. The same holds within each gender.

Table 2: Distribution of Differences in Correct Answers
(Between First and Second rounds)

Table 3: Regression of Individual Cheating levels on Gender and GPA

* Statistically significant variables at 0.05 level.

Note: Standard errors appear in parentheses.

IV. DISCUSSION

We have reported the results of an experiment consisted of two rounds designed to expose cheaters individually (though without identifying them by name or face). Comparing subjects' performance in the two rounds self-revealed their cheating levels in the first one. While the overall frequency of cheating in Ward and Beck's (1990) self-grading experiment was 28 percent, and in Schwieren and Weichselbaumer's (2010) maze-solving experiment was 37.5 percent and 42.4 percent in the non-competitive and competitive treatments, respectively, over 50 percent of our subjects exhibited a difference of at least three correct answers between their performance in the two rounds (Table 2). And while Schwieren and Weichselbaumer subjects cheated, on average, by only 1.31 and 2.91 solved mazes in the non-competitive and competitive treatments, respectively (the average extent of cheating in Ward and Beck is not reported), our subjects cheated, on average, by 4.89 correct answers. Apparently, Ward and Beck's, the same as Schwieren and Weichselbaumer's, subjects were suspicious that their cheating could be detected, and presumably our subjects could have done even better had they not divided their attention between secretly searching the web under the table, avoiding angry looks from honest classmates with whom they were competing on the promised bonus, and watching the proctor for possible signs of interest in their misdemeanor.

Our regression analysis suggests that students' cheating increases with their GPA, overall and by gender, in contrast with the extensive literature that have examined this relationship on the basis of direct-question surveys. The widely used method of gathering data through direct questioning does not account for the problems inherent in asking threatening questions, and is likely to lead to biased estimates of cheating. Our experimental approach, in contrast, has exposed students' cheating through observing their performance in answering the same trivia quiz twice, once under loose supervision and later, at a time distance which allows for possible memory of the fraudulently extracted answers to subside, under strict supervision. A possible explanation of the psychological mechanism that generated our result is that the higher is one's achievement, the stronger is his or her motivation to maintain it, thus the less

likely he or she is to overlook the temptation to cheat if an opportunity presents itself.

One might speculate that the higher propensity to cheat among high GPA students revealed in our study is due to the competitive reward structure which may only generate incentives for high achievers to cheat, as low achievers may figure out that they have no chance of ending up in the top 10 performers and not even try to cheat. However, low achievers in economics must not be less knowledgeable of world capital cities or less competent in searching the web. Most importantly, they need not be less motivated to fraudulently fight for a 5-point bonus to the course grade which could make the difference between passing and failing the course. Yet our study reveals that high achievers fought harder. Discussants of the cheating epidemic on the web agree that students nowadays value grades more than education and that good students, who feel pressure to excel at any cost, are as likely to cheat as struggling students who cheat just to get by. An interesting question for future research is to what extent cheating contributes to grades, not just to what extent grades contribute to cheating.

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APPENDIX A: TRIVIA QUIZ

The purpose of this quiz is to check your knowledge in political geography of modern time. Each question introduces the name of a certain country followed by the names of four cities, one of which is the capital city of that country. In each question, please circle the name of the appropriate capital city. The 10 students to do best in the quiz will be rewarded with a bonus of 5 points to their course grade. The reward reflects our appreciation of your personal knowledge, therefore you cannot use your smart-phone or laptop in search for the correct answers. You have 10 minutes to answer the quiz.

1. Country: Belarus
2. Capital city: Chisinau / Minsk / Bratislava / Kharkiv
3. Country: Montenegro
4. Capital city: Podgorica / Sarajevo / Dubrovnik / Zagreb
5. Country: Gambia
6. Capital city: Serrekunda / Brikama / Farafenni / Banjul
7. 4. Country: Honduras
8. Capital city: Honduras City / Tegucigalpa / Funchal / San Pedro
9. 5. Country: Laos
10. Capital city: Sainyabuli / Luang-Prabang / Thakhek / Vientiane
11. 6. Country: Armenia
12. Capital city: Vardenis / Gyumri / Yerevan / Edjmiadzin
13. 7. Country: Turkmenistan
14. Capital city: Ashgabat / Turkmenbashi / Abadan / Dashoguz
15. 8. Country: Myanmar
16. Capital city: Mandalay / Rangoon / Naypyidan / Bagan
17. 9. Country: Eritrea
18. Capital city: Burco / Djibouti / Khartoum / Asmara
19. 10. Country: Madagascar

20. Capital city: Antananarivo / Mahajanga / Antsiranana / Manakara
21. 11. Country: Tajikistan
22. Capital city: Fergana / Dushanbe / Konibodom / Khorugh
23. 12. Country: Kosovo
24. Capital city: Peje / Prishtine / Mitrovica / Sarajevo
25. 13. Country: Seychelles
26. Capital city: Elizabeth / Herbert / Victoria / Wellington
27. 14. Country: Sierra Leone
28. Capital city: Freetown / Georgetown / Lunsar / Kabala
29. 15. Country: Haiti
30. Capital city: Santo-Domingo / La-Vega / Port-au-Prince / San-Pedro
31. 16. Country: Macedonia
32. Capital city: Zenica / Baja-Luka / Split / Skopje

Answers: 1. Minsk; 2. Podgorica; 3. Banjul; 4.Tegucigalpa; 5. Vientiane; 6. Yerevan; 7. Ashgabat; 8. Naypyidan; 9. Asmara; 10. Antananarivo; 11. Dushanbe; 12. Prishtine; 13.

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