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Does Studying Economics Discourage Cooperation? Watch What We Do, Not What We Say or How We Play

Anthony M. Yezer, Robert S. Goldfarb,
and Paul J. Poppen

The weight of evidence clearly suggests that, based on what economics students say and how they play games, those who study economics appear to be less cooperative than those who do not. In a recent issue of this journal, Frank, Gilovich and Regan (1993) compile the evidence for this view. Using the results of others and new studies of their own, they show that economics students are more likely to free ride or defect from coalitions. In addition, they present survey results that indicate lowered cooperation by students after exposure to the principles of economics course and other surveys that find that professional economists report less charitable giving.

This evidence is consistent with the proposition that studying economics alters how students play structured games and answer surveys about cooperativeness. However, we disagree with the additional conclusion that, as Frank, Gilovich and Regan (1993, p. 159) put it in their article, “exposure to the self-interest model commonly used in economics alters the extent to which people behave in self-interested ways.” In fact, the evidence in this paper implies that even if undergraduate students of economics display uncooperative behavior in specialized games or surveys, their “real-world” behavior is actually substantially more cooperative than that of their counterparts studying other subjects.

Analytical Issues

Drawing a connection between the study of economics and changes in cooperative behavior isn't easy. Here, we raise four difficulties in any such analysis.

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First, it is not obvious that exposure to economics should be expected to encourage less-cooperative behavior. To be sure, introductory microeconomics is based on assumptions of rationally selfish behavior. But the study of economics also considers mutual gains from voluntary trade and exchange. In fact, our experience in teaching principles of economics is that most students enter the course believing that every market transaction creates a winner and a loser. Presumably, a student who is always looking for a winner and a loser in all social interaction is likely to be less cooperative.¹ For many students, learning of the possibility for mutual benefit may be a more far-reaching change in their understanding than a reiteration of the already well-known maxim that people are often selfish.

The paper by Frank, Gilovich and Regan provoked a response along these lines from Hirshleifer (1994). He argued (p. 2) that economists take “too benign a view of the human enterprise,” almost entirely overlooking “the dark side of the force—to wit, crime, war and politics.” In Hirshleifer’s view, economists probably focus too heavily on the mutual benefits of exchange, while not emphasizing that there is “another way to get rich: you can grab goods that someone else has produced. Appropriating, grabbing, confiscating what you want . . . that’s economic activity too” (p. 3). It is at least possible that introductory economics does not place enough emphasis on noncooperative behavior.²

Second, when asking students about the degree to which they expect cooperation from others, the responses should be compared to reliable measures of actual rates of cooperation in the general population. If students in economics courses learn that the world is in actuality less cooperative than they initially and incorrectly perceived it to be, then the teaching that produces this result should be viewed in a positive light.

For instance, consider an example based on the honesty survey used by Frank, Gilovich and Regan (1993). Suppose students believed before taking fall semester courses that 80 percent of individuals would return a \$100 bill they found lying on the sidewalk, but due to an economics course they came to believe that only 30 percent of individuals would return the money.³ Surely one’s view of the attractiveness of this teaching outcome should depend on whether the

¹ In teaching this lesson in our classes, we sometimes try to use the metaphor that, in terms of distribution of gains, market exchange is more like consensual sex than a baseball game. Even if this teaching technique fails intellectually, it usually heightens interest in the class.

² One reader suggested an intriguing twist on all this. He noted that cooperation sounds positive, and free riding pejorative. But substitute “conspiracy” for “cooperation,” and “noncooperative” behaviors can take on a quite attractive normative coloration, as in whistle-blowing, disrupting conspiracies or acting independently rather than following the crowd.

³ The 80 percent and 30 percent numbers are hypothetical. In the version of the paper published in this journal, Frank, Gilovich and Regan (1993) do not report the actual survey percentages they found. Rather, they report the direction of change in these percentages. However, they did provide us with unpublished average responses, some of which we discuss below.

true percentage in the population is closer to 80 percent or 30 percent. However, survey studies provide no evidence on the true probability that the lost \$100 would be returned.

Third, when the cooperative tendencies of students are evaluated with hypothetical questions about their personal integrity or structured games that are designed to reveal cooperativeness, their responses reflect both their true behavior and their candor about revealing such behavior. There are strong biases toward answering questions in the “right” way, or in a socially desirable manner (for example, Sudman and Bradburn, 1982). Dishonest students may try to conceal noncooperative behavior. In the end, it isn’t clear that responses in such structured situations will accurately describe the extent to which students would actually cooperate in real-world situations.⁴ Students providing the least cooperative responses to the honesty surveys may be the most honest and truthful. Economists might respond more truthfully about a low level of charitable behavior not because they are less generous, but because they are more honest or introspective about behavior. In the article mentioned above, Hirshleifer (1994, p. 1) offers his guess “that economists are not more selfish, but only more acceptant of human behavior.”

Our fourth concern is to offer a methodological warning. The “honesty survey” presented by Frank, Gilovich and Regan (1993) involved asking students in classes in economics and other subjects about their expected behavior in hypothetical situations (like the lost \$100 mentioned a moment ago) and how they would expect others to behave in these same situations. The questions were administered both early and late in the semester. The authors found sizable decreases in perceived cooperation over the semester and that these decreases were larger in a more neoclassical economics class than in either a less neoclassical economics class or in an introductory astronomy class. But in such surveys, there is often no baseline for estimating the differences that existed before students took certain classes, and measured changes in attitude may be caused by events during the semester other than exposure to a particular subject. Moreover, no explicit tests for statistical significance of the results were reported in the paper.

Knowing these concerns, the reader may be able to predict the sort of experiment we wanted: one that would reveal the extent of actual cooperation in a real-world setting, not a paper survey or a structured game. Then, the evidence on actual

⁴ The problem that self-reports in surveys or hypothetical experiments may mismeasure the actual behavior they are trying to capture arises in other settings. Striking recent examples in the “contingent valuation” literature are Cummings, Harrison and Rutstrom (1995) and Neill et al. (1994). Both studies set up controlled situations in which it is possible to meaningfully compare subjects’ expressed hypothetical willingness to pay for a specified commodity with what they are actually willing to pay. Both studies find that hypothetical responses about willingness to pay greatly exceed actual willingness to pay. In short, talk is cheap: what people say may badly misrepresent their actual behavior. For a discussion of general issues in this “contingent valuation” literature, see Diamond and Hausman (1994).

behavior for economics and noneconomics students could be compared with survey evidence on predicted and expected behavior.

Testing Actual Cooperative Behavior with Lost Letters

We designed a “lost-letter” experiment, in which envelopes containing currency are dropped in classrooms before classes in economics or other subjects are scheduled to meet. The return rate on lost letters is then used as a measure of cooperation. Separately, we also carried out a survey of what students expected would happen in this situation. Our survey results can readily be compared with the Frank, Gilovich and Regan (1993) survey results, which involved questions about return of lost letters containing currency.

The “lost-letter” approach is well established in the psychology literature (Milgram, Mann and Harter, 1965; Baskett et al., 1973). The letter was placed in an unsealed, stamped, plain white envelope, with a single name and address on the front and no indication of a return address. Inside were ten \$1 bills along with a brief handwritten note indicating that there was currency enclosed in repayment of an informal loan.⁵ Our intention was to give students finding the letters the impression that they had been written by other students.

The unsealed envelopes were left in classrooms at George Washington University shortly before the targeted classes were scheduled to begin. The envelopes were placed either on the seats of student desks or on the floor in front of student desks with the stamped, addressed side facing up. Letters were left in 64 undergraduate classes during the fall semester of 1993 and the spring semester of 1994, 32 in upper-level economics classes (that is, courses beyond the two-semester principles of economics sequence) and 32 in upper-level classes in other disciplines, particularly psychology, political science and history. The sample of economics classes included virtually all upper-level classes where there was sufficient time between classes so that we could enter the room unobserved and drop the envelope. Each envelope had a different addressee name allowing us to identify the class in which the envelope was initially dropped. Class sizes for upper-level courses were not large, generally between 15 and 25 students.

All letter drops were done by the authors. Only one letter was dropped in each class. It is possible that letters were not picked up by any student in a given class, in which case they would appear as lost letters in the next class. Given that the economics classes are a small fraction of all classes, this next class would almost

⁵ We put ten \$1 bills into each envelope, rather than one \$10 bill, to allow the finder to return a letter with less than the full amount of currency. We had intended to count returned letters based on the fraction of the initial \$10 that was enclosed: thus, a returned envelope containing \$5 would be counted as 0.5 of a returned letter. However, only one letter was returned with less than \$10, and this was returned empty. This case is mentioned below, where it is clear that the letter should be counted as nonreturned for purposes of assessing cooperation.

certainly be a noneconomics class. This introduces measurement error into the experiment. Effectively, what it means is that the measured return rate for economics classes is a weighted sum of the return rates for both economics and the following, usually noneconomics, classes. The effect of such errors would be to make the results for economics more like those for noneconomics and bias our results toward finding no difference between students in economics and other classes.

At the conclusion of the experiment we discussed it with faculty colleagues and students. We have found no evidence that an individual student ever found more than one letter or that either faculty or students were aware that an experiment was under way. Therefore, we believe that students finding these letters regarded them as genuine lost letters and that the experiment reflects responses to a real-world situation.

Results of the Experiment

The results of the letter drop experiment show a dramatic difference in cooperation between students in economics and noneconomics classes. Of the 32 letters left in economics classes, 18 (56 percent) were returned. Only 10 (31 percent) of the 32 letters left in noneconomics classes were returned. This difference is large in magnitude and statistically significant at the 10 percent level. Contrary to the expectation one would have formed based on the sort of evidence presented by Frank, Gilovich and Regan (1993), this experimental evidence indicates that economics students are far more cooperative than students studying other disciplines.⁶

The returned envelopes also provided some qualitative evidence on student reactions to the lost letters. In two cases, students added messages indicating that they had made extraordinary efforts to locate the addressee, including checking the Student Directory, the telephone directory and the university registrar. Both of these cases of "extraordinary cooperation" were by economics students. One letter was returned with the currency removed and a false return address (we were unable to locate "Mr. IOU, 1013 Indebted Lane, Bankruptcy City, Mississippi 30335"). This "extraordinary noncooperation" (mentioned earlier in note 5) involved a letter lost in a noneconomics class.

Comparisons with Honesty Surveys

As they reported in the Spring 1993 issue of this journal, Frank, Gilovich and Regan carried out a four-question "honesty survey." The survey involved two

⁶ We cannot disentangle whether these measured differences are due to initial differences in the students drawn into economics, or to the curriculum that students study in economics. One reader suggested the following possibility. Economics may be a more difficult discipline than many others, especially at the higher levels. If that were the case, there might be more studious, well-behaved students in upper-level economics courses than in other subjects. In this scenario, the differences between the students in economics and elsewhere are real, but are not due to differences in what is taught.

situations. In the first, a small business owner is shipped 10 microcomputers, but billed for only nine. In question #1, the student is first asked to estimate the probability that a hypothetical business owner would report the error. Question #2 asks the student the probability that he or she personally, in the position of the business owner, would report the error. In the second situation, an envelope containing \$100 is lost. Students are first asked, in question #3, to estimate the probability of that envelope being returned to them by a stranger. Question #4 asks the student the probability that he or she would return the envelope. Frank, Gilovich and Regan administered the survey at the beginning and end of the semester to students in two introductory microeconomics classes, one more neoclassical than the other, and students in an astronomy class. They found that while some students in all classes became less honest or more cynical during the term, as measured by the honesty surveys, the drop-off was generally greatest for the neoclassical economics class, and least for the astronomy class.

We replicated the Frank, Gilovich and Regan survey, using their exact wording for the four questions.⁷ At the beginning and end of the fall 1993 term, we surveyed two introductory economics classes and introductory classes in biology and psychology. All four courses are relatively large lectures, ranging from 130 for biology and psychology to 175 for economics, with a heavy freshman enrollment. There is no reason to suspect that students selected between the two economics courses on a systematic basis, and differences in responses to the initial survey were not statistically significant at the 10 percent level. While the instructors in both economics courses emphasized standard neoclassical economics, one instructor intentionally emphasized the advantages of cooperative solutions.⁸ The results for the four questions and the four classes, at the beginning and end of the semester, are shown in Table 1. The scores are the predicted probabilities: for example, a score of 33.4 for question #1 in column 1 indicates that the students surveyed placed a 33.4 percent probability (on average) on the likelihood that the owner of a small business would report the billing error and ask to be rebilled for the higher amount. A higher score always indicates a greater degree of cooperation.

Our first apparent result is that six of the eight differences between the first and second survey of economics courses in Table 1 indicate a less cooperative response on the second survey. This fits with what one would expect from the Frank, Gilovich and Regan (1993) results. However, only one of these "less cooperative" differences is statistically significant at the 10 percent level, using standard tests for differences in mean responses. Moreover, there is one statistically significant change in the opposite direction, toward more cooperation. If we consider statis-

⁷ The exact wording for these questions is available from the authors.

⁸ Besides emphasizing the cooperative material in lectures, the instructor used *Microeconomics*, by Samuelson and Nordhaus, as a text, because of its rather generous treatment of the role of the public sector and because the chapter on game theory illustrated cases in which cooperative solutions are Pareto superior.

Table 1
Survey Results

Question number	<i>Econ. A</i>		<i>Econ. B</i>		<i>Biology</i>		<i>Psychology</i>	
	<i>First survey</i>	<i>Second survey</i>	<i>First survey</i>	<i>Second survey</i>	<i>First survey</i>	<i>Second survey</i>	<i>First survey</i>	<i>Second survey</i>
1	33.4	32.1 ^b	34.4	27.3 ^{b,c}	34.0	30.9 ^b	30.8	35.4 ^a
2	56.9	54.0 ^b	49.9	45.9 ^b	59.0	55.9 ^b	46.0	51.7 ^a
3	24.5	28.8 ^{a,c}	23.0	24.6 ^a	25.1	25.8 ^a	28.2	26.1 ^b
4	68.1	67.4 ^b	67.1	61.3 ^b	72.4	70.5 ^b	65.7	63.3 ^b

Notes: ^a Indicates a change toward greater cooperation in the second survey.

^b Indicates a change toward less cooperation in the second survey.

^c Indicates a change is statistically significant at the 10 percent level.

No differences were statistically significant at the 5 percent level.

tically significant differences in responses to individual questions, it does not appear that exposure to introductory economics decreases cooperativeness.

We examined these results in various ways: comparing the economics class that emphasized cooperation to the one that didn't;⁹ grouping together the mean response to all four questions, rather than looking at the data one question at a time; summing over all eight responses from the two economics classes and all responses from the two noneconomics classes, and so on. Details of these calculations are available from us on request. None of the changes were significant at a 5 percent confidence level. And as mentioned, the two that were significant at the 10 percent level moved in opposite directions.¹⁰ Overall, there is little to suggest that the semester of instruction in any of these classes influenced student attitudes toward cooperation, at least as gauged by these four questions.

It is illuminating to compare results from the letter drop experiment and the honesty survey. Of course, these numbers do not represent the ideal comparison, because the surveys were done in introductory classes, while the letter drops were

⁹ Frank, Gilovich and Regan (1993) actually report whether individual students changed their opinions toward being less cooperative. They were able to do this because their questionnaire asked students to provide individual identifiers, like asking for middle names and mother's maiden name. We rejected the use of personal identifiers for two reasons. First, we are concerned about differences in truthfulness brought about by instruction in economics and thought that providing such identifiers might inhibit truthfully selfish responses. Second, we intended to (and did) carry out statistical tests of significance for changes in responses. It is not clear, statistically, how one should treat measures of change in response when the initial response is at the extreme of a scale. Students answering either 0 or 100 on the initial survey can only change in one direction. Thus, we decided to compare class average responses early in the semester versus late in the semester, which allowed completely anonymous responses.

¹⁰ The reader may wonder whether bigger class sizes might have altered these results. The short answer is "no." Our class sizes are at least 125. The difference in the critical values of the *t*-statistics for sample sizes of 125 versus (say) 1,000 are very small. Thus, our *t*-statistics would have given the same significance results even if class sizes had been much larger.

done in more advanced undergraduate classes. But the results are interesting nonetheless.

Recall that in the letter drop, 28 of 64 letters were returned—that is, 44 percent. In comparison, the average beginning of the semester prediction for the probability that the student would return a found envelope containing \$100 was 68 percent (and approximately the same for both economics and noneconomics classes). On this evidence, students seem to considerably overstate the probability that they would actually return money they found. The gap between actual return rates and reported return rates was much smaller for economics students, a 68 percent reported versus a 56 percent actual return rate, and much larger for noneconomics students, whose actual return rate was only 31 percent. These results suggest that economics students gave answers that were a more truthful reflection of their actual behavior.

When asked how likely a stranger would be to return \$100 that the student had lost, the average probability estimate of returning the money was 25 percent, which is close to the actual 31 percent return rate for noneconomics students in the lost-letter experiment.

The difference between the likelihood that you personally would return the \$100 (68 percent) and the likelihood that anyone else would (25 percent) seems startlingly large. This feature also occurs in the Frank, Gilovich and Regan data. In some unpublished tabulations they provided, the self-reported probability that the surveyed student would return the \$100 averaged 74 percent, while the students' average expectation that someone else would return the \$100 was 35 percent. This suggests that respondents may be unwilling to attribute to themselves noncooperative behaviors that they attribute to the general population of which they are a part. It provides another indication that students overstate their own true cooperativeness.

Why do the conclusions that we draw from the honesty survey results contrast so sharply with those of Frank, Gilovich and Regan? In part, the differences can be traced to slightly different methods. We compare mean responses for classes, which enables us to provide clear tests of the statistical significance of observed differences. They were able to measure and track changes in the individual student's responses, but tests of the statistical significance of observed changes are not carried out.¹¹ In addition, tabulations of their unpublished data indicate that one of their two economics classes (the one taught by the more neoclassical teacher) showed a considerably higher level of cooperation, across the board, at the start of the quarter. We don't know why. But this class started off more cooperative, so it had more room to become less cooperative; thus, the change may represent little more than reversion to the mean for all students at Cornell.

¹¹ As footnote 9 indicates, the proper test of significance for their change data is not obvious. Frank, Gilovich and Regan supplied us with unpublished mean response data by class similar to ours. But since we did not have the relevant variances for their data, we could not apply the same statistical significance tests to their mean response data that we did to ours.

We added one question to the four from the Frank, Gilovich and Regan honesty survey. This additional question asked students which situation they would prefer: that over the next 10 years, the annual growth rate in the United States is 7 percent and the annual growth rate in Japan is 15 percent; or that over the same period, the annual U.S. growth rate is 5 percent and Japan's annual growth rate is 4 percent.¹² We believe this question originated with Robert Reich. It is designed to measure differences in underlying attitudes toward international trade and cooperation.

We would expect students of economics to be more likely to choose the first response. First, introductory economics emphasizes the mutually beneficial gains from exchange or trade. Second, introductory economics courses generally present Pareto optimality as a strong welfare criterion and the first option is Pareto superior to the second.

Contrary to these expectations, we found that students in each of the four classes were more likely to give a cooperative response at the end of the quarter. Across all four sections, 61 percent of students gave the less cooperative response at the beginning of the semester, while 56 percent did so at the end. If the classes are looked at separately, the change was statistically significant only for the biology class. However, the difference in responses is statistically significant for all classes taken together as a group.

What could possibly account for this apparent "increased cooperativeness" result across all classes? Over the course of the semester, there was widespread publicity given to arguments for free trade and comparative advantage, as well as counterarguments for protection, generated by the congressional vote on the North American Free Trade Agreement, which followed shortly after a televised debate between Vice President Albert Gore and Ross Perot. The contrast between the general rise in cooperation based on this new question versus the other questions where cooperation generally fell suggests that such highly publicized discussion may affect student responses more than classroom instruction.

Overall, our survey results suggest that teaching the individualistic utility-maximizing model of human behavior did not make students' answers less cooperative on this type of survey, while acquainting students with comparative advantage, gains from trade and the Pareto welfare criterion did not make their answers more cooperative.

Of course, the evidence presented in this paper is based on a small sample drawn from undergraduate students at the George Washington University. Perhaps the location of the university at the center of the nation's capital attracts students of economics whose values differ from students elsewhere. But our results argue that whatever they may say on surveys, undergraduate students of economics display real-world behavior that is substantially more cooperative than their counterparts studying other subjects. Readers of this article will certainly have their own

¹² As with the earlier questions, this question's exact wording is available from the authors on request.

explanations and their own ideas for further experimentation. We welcome this, and we would be happy to assist others by offering more detail about our procedures. It seems clear to us that, whatever the true explanation for our results, current evidence is inadequate to differentiate among alternative explanations.

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