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Do Students Go to Class? Should They?

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Lectures and other class meetings are a primary means of instruction in almost all undergraduate courses. Yet almost everyone who has taught an undergraduate course has probably noticed that attendance at these meetings is far from perfect. There is surprisingly little systematic evidence, however, about attendance and its effects. There are three natural questions. What is the extent of absenteeism? How much, if at all, does absenteeism affect learning? Should anything be done about absenteeism?

This article presents quantitative evidence on the first two of these questions, and speculative comments on the third. First, attendance counts in economics courses at three relatively elite universities indicate that absenteeism is rampant: usually about one-third of students are not at class. Second, regression estimates of the relation between attendance and performance in one large lecture course suggest that attendance may substantially affect learning: considering only students who do all of the problem sets and controlling for prior grade point average, the difference in performance between a student who attends regularly and one who attends sporadically is about a full letter grade. In light of these results, steps to increase attendance, including making attendance mandatory, may deserve serious consideration.[1]

[1]I have been unable to find any previous investigations of the extent of absenteeism. There have been a few other studies of the relation between attendance and performance (for example, Schmidt, 1983; Park and Kerr, 1990). These studies generally confirm the findings here that attendance and performance are related even when a variety of student characteristics are controlled for. The present study differs from this earlier work in focusing on the quantitative magnitude of the relationship and on the issue of the extent to which the relationship reflects a genuine effect of attendance.

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Do Students Attend Class?

Counts were made of the number of students attending one meeting of every undergraduate economics class during a "typical" week of the spring 1992 semester at three schools. School A is a medium-sized (6000 undergraduates) private university; School B is a large (20,000 undergraduates) public university; and School C is a small (2500 undergraduates) liberal arts college. The schools are intended to be representative of the upper echelons of American colleges and universities. All three are classified by *Barron's Profiles of American Colleges* (1991 edition) as "highly competitive," the second highest of their six categories.[2]

The attendance counts were made a few weeks before the end of the semester at each school. This choice avoided both times when attendance is generally thought to be unusually low (such as just after exams and immediately before and after vacations) and times when it is generally thought to be unusually high (such as just before exams). Individuals at all three schools independently suggested that attendance a few weeks before the end of the semester was likely to be representative of average attendance. Attendance was taken at one meeting of each class during the sample week. Current enrollment figures were obtained from departmental offices.

Table 1 reports the results. The first row shows the overall absenteeism rates at each school. At School A, 34 percent of students were absent; at School B, 40 percent; and at School C, 25 percent.[3] In short, on a typical day at a typical elite American university, roughly one-third of the students in economics courses are not attending class.

The remaining rows of the table break down the overall figures along various dimensions. Course size appears to have an important effect on absenteeism. At all three schools, absenteeism is considerably lower in the smallest third of classes than in the largest third. In addition, average class size is lowest at School C and highest at School B, which is consistent with the fact that absenteeism is lowest at C and highest at B. Absenteeism is also lower in courses with a significant mathematical component (such as econometrics, honors sections of intermediate theory, and field courses in theory). This pattern holds

[2]A total of 127 schools, enrolling about 675,000 undergraduates, are classified by *Barron's* as "most competitive" or "highly competitive." Of these, 24 schools, with 140,000 undergraduates, are private universities with between 4000 and 10,000 undergraduates; 14, with 270,000 undergraduates, are public universities with over 10,000 undergraduates; and 56, with 100,000 undergraduates, are colleges or universities with minimal graduate programs and fewer than 3500 undergraduates. The remaining schools are small and medium-sized public colleges and universities (15 schools, with 70,000 undergraduates), large private universities (5 schools with 70,000 undergraduates), and small private universities (13 schools with 30,000 undergraduates).

[3]Attendance counts were inadvertently not made in a handful of classes at School C. These classes do not appear to differ in any systematic way from the classes at which attendance was taken.

Table 1
Absenteeism Rates in Economics Classes

	School A	*School B*	*School C*
All Economics Courses	34.0%	39.7%	24.8%
By Size of Course:			
Small (bottom 33%)	27.0	37.7	21.5
Large (top 33%)	38.8	42.9	30.4
By Mathematical Content:			
Mathematical	10.0	17.6	16.7
Non-Mathematical	34.3	41.5	25.5
By Type of Course:			
Principles & Intermediate Theory	37.3	40.5	29.7
Upper Level, Only Principles Required	26.4	41.1	17.7
Upper Level, Additional Requirements	33.3	35.2	20.7

at all three schools.[4] Similarly, at all three schools absenteeism is somewhat higher in core courses than in field courses.

Finally, it is generally perceived, not surprisingly, that students attend class more often when the quality of instruction is higher. At School B, for example, absenteeism is 34 percent for courses taught by regular faculty and 47 percent for courses with other instructors. To investigate this issue more systematically, course evaluation data for all undergraduate economics courses for one term were obtained from a fourth school, School D. This school, like School B, is a large public university. The two variables of interest are students' average rating of the overall effectiveness of the instructor and the fraction of the students enrolled in the course who returned the course evaluation form (which is a reasonably good measure of attendance at one of the last class meetings of the term). The point estimates from a simple regression of the fraction of students attending the class on the average rating imply that raising the average rating from the 25th percentile to the 75th lowers absenteeism by 10 percentage points; the t-statistic on the rating variable is 3.4. Thus the quality of instruction (or at least students' perception of that quality) appears to have an important impact on attendance.

[4]The figures for mathematical courses at School A are based on only one course. Thus this figure should be given little weight.

Other features of the data from School D generally confirm the findings for the other schools.[5] Absenteeism is high (45 percent across all courses), and lower in small courses than in large (31 percent in the smallest third of courses and 54 percent in the largest third). Again, absenteeism is lower in courses with a mathematical emphasis (39 percent, versus 47 percent for other courses), and higher in core courses (52 percent, versus 31 percent in field courses that only require principles and 37 percent in advanced field courses).

A straightforward regression confirms these patterns of differences in absenteeism across different types of courses. Specifically, using the data from all four schools, I ran a regression (across courses) with the fraction of students absent as the dependent variable, and a constant, the log of enrollment, and dummies for mathematical content, for the two types of upper level courses, and for three of the four schools as independent variables. The resulting estimates imply that a doubling of enrollment is associated with a rise in absenteeism of 4 percentage points; that mathematical content is associated with a fall in absenteeism of 3 percentage points; and that moving from a core course to either type of field course is associated with a fall in absenteeism of 5 to 7 percentage points. The coefficient on the enrollment variable is highly statistically significant; those on the field course dummies are marginally so; and those on the dummy for mathematical content and the three school dummies are insignificant.

Should Students Attend Class?

These findings raise the question of whether absenteeism has a substantial effect on learning. It is possible that students do not attend class because they would learn relatively little if they did—because the instruction is of low quality, or because they have already mastered the material, or because they can learn the material better by spending the same time studying in other ways. Alternatively, it is possible that learning is severely adversely affected by absences, but that many students are absent anyway—because they have genuinely better uses of their time, or because they mistakenly believe that attendance is not important to learning, or because they attach relatively little importance to learning.

Because student attendance is not exogenous—students *choose* whether to attend class—it is not possible to isolate definitively the impact of attendance on

[5] The data from School D are not strictly comparable with those from the other schools, because they reflect class meetings at the end of the term and because a few students are present but do not return the evaluation form. It seems unlikely that these differences have any substantial effect on the results.

learning. But this section presents some suggestive evidence. In the fall 1990 semester, I took attendance at six meetings of my large intermediate macroeconomics course. The resulting data can be used to investigate the relation between attendance and performance.

As in other courses, overall absenteeism was high (25 percent). Twelve percent of the students missed four or more of the meetings where attendance was taken; 28 percent missed two or three; and 59 percent missed none or one. Thus, absenteeism appears to be a mixture of some students missing most classes and many students missing a smaller number of classes.

Student performance is measured as the overall score on the three exams in the course. For ease of interpretation, the scores are converted to the usual 4-point grading scale: 3.84 and above represents an A; 3.50 to 3.83 an A− ; and so on down to 1.50 to 1.83 for a C− . Because no D+ 's or D− 's were assigned, 1.17–1.49 represents a D and 1.16 and below an F.

The first column of Table 2 reports the results of a simple regression of performance on the fraction of lectures attended.[6] The regression reveals a statistically significant and quantitatively large relation between attendance and performance. The t-statistic on attendance is 6.2; the point estimates imply that a student who attends only a quarter of the lectures on average earns a 1.79 (C−), while a student who attends all of the lectures on average earns a 3.44 (B+). Attendance alone accounts for 31 percent of the variance in performance.

Students who are more interested in the material, or more skilled academically, or more focused on academics are almost certain to attend class more often than students who are less interested, less skilled, or less focused (other factors held constant). If this is the case, then the results in Column 1 of Table 2 to some extent reflect a general impact of motivation on performance rather than a true effect of attendance.

I attempt to address this problem in three ways. First, I restrict the sample to the 60 percent of the students who did all nine problem sets. It seems likely that most of the students who were not devoting serious effort to the course did not complete all of the problem sets. In addition, the lowest problem set score was dropped in computing the course grade; thus the students who completed all nine may have been especially motivated. On both grounds, this restricted

[6]There is one econometric complication worth mentioning: because attendance was not taken at every class meeting, some of the variation across students in measured attendance is due to measurement error rather than to true differences in attendance over the whole semester. If the class meetings at which attendance was taken were a random sample of all the meetings—which appears to be a good approximation—it is straightforward to estimate the size of the measurement error. This procedure implies that 28 percent of the variation in measured attendance represents measurement error. This estimate can be used to correct the regression coefficients, standard errors, and R^2's for the bias that would otherwise be introduced by the measurement error. All of the results reported in Table 2 have been corrected in this way.

Table 2
The Relationship Between Attendance and Performance

	(1)	(2)	(3)	(4)	(5)
Sample:	*Full*	*Restricted*	*Full*	*Full*	*Restricted*
Constant	1.25	1.02	1.07	−0.67	−0.78
	(0.27)	(0.58)	(0.23)	(0.32)	(0.43)
Fraction of Lectures Attended	2.19	2.47	1.74	1.52	1.38
	(0.35)	(0.70)	(0.46)	(0.32)	(0.58)
Fraction of Problem Sets Completed			0.60		
			(0.32)		
Prior GPA				0.78	0.86
				(0.12)	(0.14)
Sample Size	195	116	195	195	116
R^2	0.31	0.26	0.33	0.47	0.48

Standard errors are in parentheses. The restricted sample consists of the students who completed all of the problem sets.

sample may be more homogeneous in terms of general motivation than the full class. But as the second column of Table 2 shows, the relation between attendance and performance in this sample is actually slightly stronger than for the class as a whole.

Second, doing the problem sets is arguably as good a proxy as attending the lectures for motivation. But Column 3 shows that there is a much stronger relation between attendance and performance than between doing the problem sets and performance: when both variables are entered in the regression, the coefficient on the fraction of lectures attended is almost three times as large as the coefficient on the fraction of problem sets completed. Thus, either attendance is a much better proxy than completing the problem sets for motivation, or attendance has a large additional impact on performance.

Third, data were obtained on students' grade point averages as of the beginning of the semester. Including GPA as a control variable in the regression serves to control for some of the differences across students in general ability and motivation. In fact, because students' academic performance in previous classes depends in part on their attendance in those classes, the coefficient on prior GPA will capture some of the effect of attendance on performance; as a result, including GPA as a control variable could cause the coefficient on attendance to *understate* the true impact of attendance on performance.

Column 4 of Table 2 shows the effects of including grade point average in the regression. Prior GPA has an extremely strong relation with performance. But the inclusion of GPA has little impact on the relation between attendance and performance. The coefficient on attendance is two-thirds as large as it is in the basic regression in Column 1, and it remains highly significant. The point estimates imply that a student with the mean prior GPA earns on average a 2.13 (C) if he or she attends a quarter of the lectures but a 3.27 (B +) if his or her attendance is perfect.

Finally, Column 5 shows the results of both restricting the sample to the students who did all nine problem sets and controlling for prior GPA. Even in this case, the relation between attendance and performance remains large and significant. The estimates imply that a student with the mean prior GPA earns on average a C+ if he or she attends only a quarter of the classes, compared to a B+ if attendance is perfect.

None of these ways of attempting to address the problem that attendance is not exogenous is definitive. Nonetheless, they all give similar results: simple ways of controlling for motivation and other omitted factors have only a moderate impact on the relationship between attendance and performance. Thus, although the possibility that the relationship reflects the impact of omitted factors rather than a true effect cannot be ruled out, it seems likely that an important part of the relationship reflects a genuine effect of attendance.

Should Attendance Be Mandatory?

Absenteeism is rampant in undergraduate economics courses at major American universities. In addition, there is a very strong statistical relationship between absenteeism and performance, and the evidence is consistent with the view that this relationship has an important causal component.

These results raise the question of whether measures should be taken to combat absenteeism. At the very least, exhortations to attend class seem called for, and those exhortations can be backed up with data. But stronger measures might be preferable. A generation ago, both in principle and in practice, attendance at class was not optional. Today, often in principle and almost always in practice, it is. Perhaps a return to the old system would make a large difference to learning. There is no way to find out but to try. I believe that the results here both about the extent of absenteeism and its relation to performance are suggestive enough to warrant experimenting with making class attendance mandatory in some undergraduate lecture courses.

One could also use mandatory attendance to perform a genuine controlled experiment that could isolate the true impact of attendance on mastery of the material. Specifically, one could randomly divide the students in a course into two groups, an experimental group whose grading was based in part on attendance and a control group whose grading was not. By comparing the attendance and the performance of the two groups, one could learn both the impact of mandatory attendance on absenteeism and the impact of attendance on performance.[7] Unless either the impact of mandatory attendance on absenteeism or the size of the class were very large, the results of carrying out this experiment for a single class would not allow one to estimate the impact of attendance on performance with much precision. But the pooled results from several such experiments could.

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[7]Such an experiment would presumably require appropriate approval. Students could be given the right to opt out of the experiment by being allowed to choose (before the class is divided into the experimental and control groups) to have their grade based on a formula that gave attendance half the weight used in the grading formula for the experimental group. Fairness could be ensured by assigning grades to all students using all three procedures (experimental, control, and opting out), and making the mean grade for the full class the same under all three procedures, before the allocation of the students to the three groups was known to the person assigning grades.

References

Park, Kang H., and Peter M. Kerr, "Determinants of Academic Performance: A Multinomial Logit Approach," *Journal of Economic Education*, Spring 1990, *21*, 101–11.

Schmidt, Robert M., "Who Maximizes What? A Study in Student Time Allocation," *American Economic Review*, May 1983, *73*:2, 23–28.