THE IMPACT OF EMPLOYMENT AND EXTRACURRICULAR INVOLVEMENT ON UNDERGRADUATES' PERFORMANCE IN A BUSINESS STATISTICS COURSE

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ABSTRACT

Using data covering every semester and summer from Fall 2007 through Spring 2011 collected at a comprehensive regional public university in an applied business statistics course we examine the impact of academic course load, employment and other time commitments on students' eventual grades in the course. We find that employment has a weak but positive effect on performance in the course, while working more hours lowers one's grade. Involvement in extracurricular activities has no significant effect on grades. We also demonstrate that controlling for students' overall academic ability (we use GPA) is vital to establishing reliable links between these factors and a grade in a particular course.

INTRODUCTION

The purpose of this study is to assess the impact of various academic and non-academic factors on students' academic performance. These include academic course load, on- and off-campus employment, participation in sports and other extra-curricular activities, among others. College students choose to work while enrolled in school in increasingly larger numbers; this is partially due to the rapidly increasing cost of higher education (even in inflation-adjusted terms), but other reasons have been cited in the literature as well.[1] And there are other activities competing for the student's time (and attention): participation in sports – whether formal or informal (e.g., intramurals), involvement in extracurricular activities – such as social clubs, service and Greek organizations; volunteer work, etc. The central question of interest here is: Does greater involvement in these non-academic activities adversely affect academic performance?

Briefly, two competing theories can be advanced with respect to the likely direction of this effect. First, outside activities take up time, at least some of which would otherwise be devoted to schoolwork, which in turn can lead to lower grades. Second, students choosing to work or get involved in clubs and organizations are better at prioritizing work, managing their time, and may in general be more motivated than an average student; if so, then this selection bias would lead us to finding students with greater involvement also performing better academically. It is likely, however, that both effects are present to some degree (as previous studies have documented – see below): for example, working several hours a week is associated with receiving better grades, but working too much can lead to poorer performance.[2]

To address these issues (and others), we employ a unique dataset assembled over five years in an applied business statistics course taught in a AACSB-accredited college of business at a US comprehensive regional public university.

LITERATURE REVIEW

Studies linking college students' employment to their academic performance are rather few and far between. Even fewer studies consider the effects of other factors – such as extracurricular involvement – on academic performance. A notable exception is Dundes and Marx (2007) who study academic performance (defined as "hours studied and higher grades") of undergraduate students at a small liberal arts college, and find that students who strike the optimal balance between work and school perform the best. That balance turns out to be between 10 and 19 hours of work per week; moreover, students in this group do better academically on average than all other students, including those who do not work at all.

These findings are echoed by Pike et al. (2008) who use data from the National Survey of Student Engagement (NSSE) to examine the effect of work on first year students' academic achievement. They conclude that working more than 20 hours a week affects grades negatively, even after controlling for a variety of individual student characteristics. The study also suggests that working on campus for 20 hours or less has an indirect positive effect on first year students' grades acting through increased engagement. Similarly, Torres et al. (2011) find that younger undergraduates at two urban commuter colleges in Indiana who work more than 31 hours a week have lower grade point averages (GPAs) and are less likely to complete the courses they enroll in.

A different, more theoretic modeling approach is taken by Wenz and Yu (2010), who actually model a student's decision to work while enrolled in school. In general, they find that working has a negative impact on academic achievement; specifically, each work-hour lowers student GPA by 0.007. More interestingly though, the authors conclude that there are significant differences in the academic achievement of various groups of students depending on what motivates them to work in the first place: students working for primarily financial reasons earn lower grades than those who work to acquire career-specific skills, but higher grades than students who simply want general work experience.

A contrasting set of results is obtained by Bradley (2006) who reports that the study of 246 university students found approximately 85 percent reporting having a paid job during the semester. However, academic performance appeared to be unaffected by either employment or the number of weekly hours worked: GPA's were relatively high for both, those who did not work and those working more than 20 hours per week.

A number of studies report similar results from analyses of working college students in other countries. For example, Humphrey (2006) uses data obtained from a survey of students at an English university to establish a significant link between working and end-of-year average grade as well as participation in university societies. A key finding is that students coming to the university from state schools tend to work more than students from private schools, and as a consequence tend to, on average, perform worse academically.

Callender (2008), perhaps the most comprehensive study in its scope – the data used are from 1,000 students at six British universities – also finds that working has a detrimental effect on the students' final year marks as well as their degree results (i.e., graduation). In particular, students working an average number of hours per week are "a third less likely to get a good degree than an identical non-working student."

A study of Chinese college students by Wang et al. (2010) finds that working part-time has no effect on academic performance of students and a positive effect on the students' social life, while possibly damaging their relationship with their parents.

There are even fewer examples in the literature of studies addressing the effects of other student activities on academic achievement and performance. Turley and Wodtke (2010) report that while in general first-year college students living off-campus perform as well as those living on-campus, among Black students, campus residents have higher GPA's than similar students at the same institution living off-campus. Rees and Sabia (2010) find some limited support for the theory that sports participation increases motivation, teaches teamwork and self-discipline, thereby leading to better performance in school.

Quite a few studies report results of data from high school students engaging in extracurricular activities and paid work (Lee & Orazem, 2010; Staff et al., 2010; Patton & Smith, 2010). Many of the studies conclude that working more hours during the academic year does not affect high school academic performance; on the other hand, increased high school work intensity raises the probability of completing high school but lowers the likelihood of going to college. In any event, this lies outside of the scope of our paper.

While the existing literature does have something to say about the link between student employment and academic performance, our study improves and advances our understanding of the subject in several ways. First, as discussed above, many existing studies focus on high school students' academic performance rather than college students; this is mainly due to lack of data on undergraduates' experiences. Second, most studies measure academic performance using standardized test scores, whereas we use grades actually earned in a specific course, which is clearly a superior measure of performance *in that course*. In particular, our data are from the same course taught by the same instructor using the same approach (e.g., a consistent grading scheme), all of which makes it easier to isolate the effects of other factors on student performance. Third, the present study is the first, to the authors' knowledge, to focus on a business statistics course. This is important because this particular subject is unique in the sense that the material taught combines ideas, analytical thinking, ability to abstract, quantitative skills, and problem solving – in other words, many of the knowledge areas that college students are expected to acquire. Fourth, the data we use are substantial in their depth and breadth, containing detailed information at the individual student level spanning hundreds of students, several years and settings (e.g., morning vs. afternoon or evening class), all of which make this vastly superior to using data from a large but generic dataset, such as the National Longitudinal Survey of Youth (NLSY).

BACKGROUND

The course, "Applied Statistical Analysis," ("statistics" hereafter) is part of the "business foundation" and is required for all business majors.[3] The course is typically taken by students in their junior year and has one prerequisite – Probability and Statistics. This prerequisite course is taught in the Mathematics department, outside of the College of Business. Many students take this prerequisite elsewhere, most often at a community college.[4]

Statistics is a basic business statistics course covering topics of hypothesis testing, ANOVA, and regression techniques. Other topics – such as nonparametrics – are sometimes covered by individual faculty teaching the course but are not required. The focus is on applied data analysis with heavy emphasis on business and economic applications.

Students' grades in this course, when taught by the author, are determined as follows. There are four noncumulative exams and eight graded quizzes. The quizzes are administered online through a course management system (such as Blackboard) and contribute 15 percent to the overall grade. The exams are all equally weighted at 20 percent each. An additional five percent of the grade is reserved for class attendance and participation.

Students are given an opportunity to improve their grade by completing an optional project using regression techniques they learned in class. The project involves the student independently selecting a topic to study, formulating a hypothesis, deciding what dependent variable and independent variables to use in testing the hypothesis, locating or collecting data, and performing regression analysis. The topic can be anything of the student's choosing, but must be approved by the instructor on the criterion of being "doable" – i.e., variables are quantitatively measurable, data are available or can be reasonably gathered, etc. The grade for the project, which comes from a presentation the student makes to the class and a paper submitted to the instructor, replaces the lowest of the first three exam grades; students cannot use the project to avoid taking the fourth exam.

DATA SOURCES AND CONSTRUCTION

In this section, we briefly describe how the data were obtained and the methodology of analysis used. On the first day of every semester and summer session from fall of 2007 through spring of 2011, the author asked students to fill out a 3” X 5” card with the following information:

Name
Phone number
Email address
Major
Year in school
List of mathematics courses student has taken previously
How many credit hours student is taking during the current term
Other time commitments student has

The phone number and email address are collected for record-keeping purposes only. Asking for this information was more important before it was easily obtainable through a university information portal. Verbally, the students are encouraged to list any math courses they have taken in college -- i.e. to not include any high school courses or advanced placement credit, but to include courses transferred from, say, a junior college. The last two items are the most interesting since the first provides us with the course load the student has at the time she is taking the course, while the second reveals what other activities she is involved in. This is where students tell us if they work (and if so, how many hours per week), participate in sports or other activities (again, with an estimate of a weekly time devoted to these activities) or anything else they deem important and time consuming. Examples of what students have listed in the past include: Taking care of family (children, elderly or disabled relatives), informal sports (e.g., fitness), church and other faith-based activities. The remaining items on this survey provide sources of control variables – student’s major, year in school, level of math background/preparation, and when the class was taken (semester, year, day of the week, and time of day).

These data are matched with student records (obtained from the university registrar’s office) on cumulative GPA and author’s own records containing students’ final course averages.

Our dependent variable – the variable of interest – is of course the student’s grade, and it is modeled as a function of the other (explanatory) variables. We pose and attempt to answer the following questions:

- Does working (i.e., having a job) significantly affect students’ grades?
- Is there a significant difference between working on- and off-campus in terms of its effect on grades?
- Does working more hours per week have a significant negative effect? If so, does it become more pronounced above a certain number of hours per week?

- Does involvement in extracurricular activities have an effect on grades?
- Is an increase of one hour per week in an extracurricular activity equivalent to working an additional hour at a job in terms of its effect on grades?
- What is the effect of a heavier academic course load on grade in a given course?
- Does the level of math preparation or background matter for one's grade in statistics?
- Are courses taken in the summer different from those taken in the long semester or at certain times of day, holding other factors constant?
- Are any of the above effects stronger for certain majors?

SUMMARY OF DATA

The dataset is comprised of 554 observations. This covers the period from Fall 2007 through Spring of 2011 and includes classes taught during summer sessions in addition to those taught during long semesters. Only students who completed the course were retained in the sample – i.e., those who stopped coming to class or failed to take all four of the scheduled exams, were discarded.[5] Students taking the course multiple times are retained as multiple independent observations, provided they completed the course each time. Below we highlight some summary statistics, which are shown in Table 1.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
grade	81.609	10.295	45.74445	100
gpa	2.831	0.565	1	4
course_load	12.903	3.714	3	20
pct_full_load	0.913	0.192	0.4	2
math_courses	2.638	0.965	1	7
spring	0.379	0.486	0	1
fall	0.507	0.500	0	1
summer	0.114	0.318	0	1
am	0.841	0.366	0	1
before10	0.446	0.498	0	1
accounting	0.181	0.385	0	1
management	0.146	0.354	0	1
finance	0.094	0.292	0	1
marketing	0.208	0.406	0	1
economics	0.022	0.146	0	1
generalbus	0.233	0.423	0	1
intlbus	0.054	0.227	0	1
compsci	0.009	0.095	0	1
other	0.023	0.152	0	1
two_major	0.029	0.168	0	1

Table 1: Descriptive Statistics				
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
remedial	0.038	0.191	0	1
advanced	0.031	0.173	0	1
freshman	0.005	0.073	0	1
sophomore	0.027	0.162	0	1
junior	0.417	0.494	0	1
senior	0.534	0.499	0	1
5th_year	0.005	0.073	0	1
work	0.610	0.488	0	1
work_hours	15.627	15.022	0	60
on_campus	0.058	0.234	0	1
activities	0.572	0.797	0	5
sports	0.081	0.273	0	1
greek	0.119	0.324	0	1
volunteer	0.022	0.146	0	1
family	0.043	0.204	0	1
church	0.020	0.140	0	1

About 38 percent of the sample took the course in the Spring; about 51 percent took it in the Fall, with the remaining students taking it in the Summer (second five-week session of the summer term, to be exact.) Approximately 84 percent of the sample took the course when it was scheduled to start in the morning (before noon); about 45 percent took the course with a pre-10:00 am scheduled start.

The mean numeric course grade (*grade*) for the entire sample is 81.58 with the range 45.75 to 100. As noted before, this final course grade reflects some students' attempts to improve their performance by completing the optional data analysis project described earlier; therefore, this mean likely overstates the students' average performance in the class (as reflected by exams and quizzes only).

The majors represented in the sample are as follows:

General Business	23%
Marketing	20
Accounting	18
Management	15
Finance	9
International Business	5
Economics	2
Computer Science	1
Other	2
Total	100%

In addition, about 2.9 percent of the sample reported having a double major. This is fairly representative of the relative popularity of the business majors in general, which should come as no surprise since all business majors must take the statistics course.

The mean reported number of math courses taken prior to enrolling in statistics is 2.63, with the range from 1 to 7. A minimum of one course is reported for all observations, which is re-assuring since there is a one-course pre-requisite. About 3.8 percent of the sampled students reported having taken at least one remedial math course, while about 3.2 percent reported having taken "advanced" math courses.[6]

Overwhelmingly, the students in the sample are self-reported juniors and seniors, with the exact breakdown of classifications as follows:

Freshman	0.6%
Sophomore	2.7
Junior	42
Senior	53
5th year	0.5
Total	100%

Mean course load is 13.88 semester credit hours for the long semester (ranging from 6 to 20 hours) and 4.66 for the summer session (ranging from 3 to 12, though the 12 credit hours reported during the summer term is an extreme outlier and almost certainly includes courses taken at another institution and/or online concurrently with courses taken at this university.) To combine long semester and summer observations into a single measure of a student's course load, we compute the percentage of a full course load (*pct_full_load*), taken to be 15 hours in Spring/Fall and 6 hours in Summer, for each observation. The mean percentage of a full course load for the entire sample is 91.2. In other words, most students are either full-time college students, in the traditional sense, or close to it.

About 61 percent of the sample report having some type of gainful employment while in school. The overall average number of hours worked per week is 15.6; the average number of hours worked for just those who reported working is 25.22, ranging from 4 to an unbelievable 60 hours per week! Nearly 10 percent of those who reported working (approximately 5.7 percent of the sample) said they worked on campus; in some instances these students worked off-campus as well.

In response to the question prompting the students to list "other significant time commitments," the mean number of extra-curricular activities reported is 0.6, ranging from zero to 5. The mean number of activities for just those who reported such activities is 1.36. Approximately 8.1 percent reported being involved in sports; slightly less than 12 percent were involved in a Greek organization (social fraternity or sorority); about 4.3 percent cited taking care of family as an activity, which included children, parents, as well as extended family; 2 percent reported church involvement, and 2 percent reported volunteering.

To control for the variation across students in academic ability, we use cumulative grade-point average (GPA) at the time the student enrolls in statistics. The observed values of cumulative GPA in the sample range from 1.0 to 4.0 with a mean of 2.83 and sample standard deviation of 0.57. We expect the students' GPAs to account for a large portion of the variation in course grades.[7]

RESULTS

We estimated several models on our complete dataset. The results are shown in Table 2. Some of the factors appear to be significant predictors of grades in every specification that we attempted, so we discuss those here first, before turning to other variables of interest.

Table 2: Estimation Results
(absolute value *t*-statistics in parentheses)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	48.614***	51.726***	52.243***	50.211***	85.007***
	(28.51)	(27.97)	(26.30	(21.00)	(49.14)
GPA	12.28***	12.287***	12.096***	11.608***	
	(21.95)	(22.34)	(21.49)	(19.81)	
Spring		-2.302**	-2.345**	-2.893**	-2.038
		(2.11)	(2.12)	(2.54)	(1.35)
Fall		-4.415***	-4.389***	-4.912***	-4.591***
		(4.19)	(4.13)	(4.44)	(3.17)
Before10	-3.413***	-2.781***	-2.847***	-2.81***	-2.473***
	(5.44)	(4.26)	(4.34)	(4.24)	(2.76)
Work	2.104*				
	(1.84)				
Work_Hours	-0.0982***	-0.0351*	-0.041*	-0.0243	-0.104***
	(2.63)	(1.70)	(1.90)	(1.09)	(3.57)
On_Campus			1.662	1.922	3.2*
			(1.24)	(1.42)	(1.76)
Math_Courses			0.0785	0.0877	0.901**
			(0.24)	(0.26)	(1.99)
Remedial			-2.607	-2.115	-9.005***
			(1.54)	(1.25)	(3.96)
Pct_Full_Load				3.049*	
				(1.75)	
Activities			-0.0975	-0.165	0.435
			(0.24)	(0.33)	(0.79)
Sports				0.893	
				(0.71)	
Greek				0.361	
				(0.33)	
Volunteer				-0.07	
				(0.03)	
Family				1.581	
				(1.00)	
Church				-0.283	
				(0.12)	
Accounting				1.782**	
				(2.12)	

Table 2: Estimation Results
(absolute value *t*-statistics in parentheses)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Economics				0.695	
				(0.32)	
Finance				2.856***	
				(2.61)	
Compsci				2.89	
				(0.88)	
Adj. R^2	0.493	0.509	0.509	0.513	0.094

Cumulative GPA (*gpa*) is by far the most important factor – both in terms of its statistical significance and in terms of the magnitude of its impact – in predicting the course grade. In all of our specifications, *gpa* is highly significant, and an increase of one point in this variable is associated with an increase in *grade* of between 11.6 and 12.3 percent, i.e. more than a full letter grade. It appears that students who took statistics in the fall did significantly worse than students who took the class during the spring or summer sessions. In particular, taking the class in the fall lowers one's grade by between 4 and 5 percentage points relative to taking the class in the summer, depending on the exact model specification. The coefficient on the spring semester dummy is also significant and negative in all of our regressions but has a smaller magnitude, averaging about 2.3 percent, suggesting a negative effect there as well. The impact of the long-semester classes is likely underestimated here: summer classes are too short to allow for the optional project opportunity, so the grades students receive in the summer, everything else the same, should on average be lower. This observation is difficult to explain. Perhaps summer courses allow students to concentrate their efforts better; also, it is possible that a class that meets every day reinforces students' learning in a way that a class that meets only twice a week simply cannot. It is worth noting that it does not seem as though higher grades in the summer are a result of students not taking a multitude of other courses (our measure of academic course load is only very weakly significant in one of our specifications, where it actually has a positive coefficient) or working substantially less (the average number of hours worked per week in the summer is 23.8 versus 25.2 during the academic year).

Students taking the class in the early morning (before 10 a.m.) receive between 2.5 and 3.4 percent lower grades than those taking later classes. This is not entirely unexpected. Anecdotally, a typical college student prefers afternoon classes to morning classes. This is supported by the author's own observation that whenever sections of the same course are scheduled both in the morning and in the afternoon, the afternoon sections tend to fill up with registered students first. While this does not automatically imply higher grades in the afternoon courses, it is likely that the relatively stronger (academically) students are first to sign up, while the weaker students tend to postpone registering. Furthermore, students needing to repeat the course due to failing it during the previous term would be registering late and likely forced in to the remaining open spots in the morning classes.

We now turn to the two other main factors of interest – work and involvement in extracurricular activities. The coefficient on the *work* dummy is positive and significant (but only at the 10 percent level), indicating that students who work actually do better in statistics than those who do not, on average. On the other hand, the coefficient on *work_hrs* is significant and negative, suggesting, as expected, that working more hours per week tends to lead to lower grades. Specifically, in our Model 1, while working is associated with about a 2.1 percent increase in the course grade, working each additional hour per week lowers one's grade by 0.1 percent. The latter effect is obviously too small to be meaningful, even if one considers a large increase in weekly hours worked: say, going from 20 to 40 hours per week. Furthermore, this effect does not appear robust as the significance of *work_hours* drops and eventually goes away completely as we add more factors to the model.

What is perhaps most interesting (and somewhat surprising) is that we find no evidence of other, non-work activities having any effect on student grades. None of our dummy variables turn out to be significant predictors of grades. The sheer number of activities reported as "significant time commitments," recorded in *activities* comes out insignificant as well. It is possible that some of the activities go underreported. For example, if a student is not a member of a social fraternity or club, he may not report being involved at all, whereas in reality the formal activity "Greek fraternity" may simply be substituted by the informal activity "hanging out with friends". The latter is still a time-consuming activity and could still have an effect on one's grades, but our data have no record of it.

The remaining few control variables are included to determine whether performance varies across student classifications or majors. We find some evidence of differences across majors in Model 4: students majoring in finance receive significantly higher grades – by almost 3 percent – while accounting majors enjoy a nearly 2 percent boost relative to other majors. This result makes some intuitive sense if one considers that finance and, to a lesser extent, accounting, are relatively more quantitative fields than, say, marketing; in other words, it is possible that students majoring in these areas tend to be better performers in other quantitative courses outside of their majors.

We attempted a "kitchen sink" kind of a regression model as well – adding every regressor available, including full sets of dummies for all majors and student classifications, to the right hand side of our model. The results did not reveal anything not already discussed above, so out of space considerations they are relegated to an appendix, available from the authors upon request.

As one final exercise, we removed *gpa* from our model and estimated a "naïve" regression – essentially, Model 3 but without the GPA variable; the results are shown as Model 5 in Table 2. Not surprisingly, the fit of the model as measured by R^2 drops considerably from about 0.51 for Model 3 to only 0.094 for Model 5. More importantly, however, several factors emerge as significant predictors of grades whereas previously (i.e., in a model controlling for students' GPA) they were not.

Of particular interest is the impact of mathematical background and preparation on student performance in our statistics course. Students who reported taking at least one remedial math course did significantly worse in statistics: the coefficient on the *remedial* dummy is about –9. This is a rather large effect, amounting to as much as a letter grade. On the other hand, the number of math courses taken previously has a positive effect on grades, albeit the coefficient is small – less than 1 – but is statistically significant at the 5 percent level. Clearly, these results are biased – we showed above that once student academic quality is controlled for, neither of the math preparation measures matters. In fact, it appears that strong students find a way to do well in the course regardless of their mathematical background. However, we present these results here as a cautionary note: it would be rather easy to draw conclusions based on the results in Model 5, which suffer from the omitted variable bias.

We would be remiss to not at least mention one important caveat plaguing our analysis. The decision on the part of a student to work and/or get involved in activities (and for that matter, how many hours to work or how many activities to participate in) is endogenous in our model. In other words, a student may decide to reduce the number of hours she works after noticing her grades declining as the semester progresses; alternatively, a student may choose to get a job midway through the term once he realizes that he has a firm grasp on his studies and has some free time. Similarly, students can drop courses to lighten their load part way through the semester. Unfortunately, we are unable to track such changes for each student; our data collection occurs at the very beginning of the term, so we implicitly assume that the student has made whatever choices she will make with respect to her course load, employment and extracurriculars. On the other hand, we have no reason to suspect that students who, say reduce their work hours or participation in activities outnumber those who increase their workload or get more involved. Therefore, we do not suspect that our results are systematically biased in any direction.

CONCLUDING REMARKS

In this study of student performance in a typical business statistics course, we find that a student's overall academic ability – proxied by GPA – is the single most important factor. When students take the course also has some effect (e.g., summers are better than either spring or fall semesters, and afternoons are better than mornings). On the other hand, being involved in many extracurricular activities has no measurable impact on grades; having a job has a weak positive effect on grades, while the effect of working more hours has a small but significant negative effect. We also demonstrate the risk of drawing conclusions based on a "naïve" model which omits a key determinant of student success in a particular course – her overall GPA.

Our results should be of interest to a wide audience: current and future college students, parents, faculty, and academic advisors. One potential way to extend and improve our approach and results would be to consider how certain components of a student's grade, such as the quiz average or attendance, are affected by working or being involved in many activities. For example, it would be interesting to examine how important class attendance is to performing well in the course, and if those with many other time commitments are able to keep up with regular assignments (quizzes).

ENDNOTES

1 Other reasons commonly cited for a college student's decision to work while in school: financial stress (unrelated to the cost of college), need to obtain experience for a future job, and boredom.

2 There is also a third possibility: students who work may actually become better students over time as working helps them develop time- and task-management skills.

3 The following undergraduate business majors are offered within the College of Business: accounting, business economics, computer information systems, finance, general business, international business, management, and marketing. In addition, nonbusiness majors are offered in computer science (BS), economics (BA), and information technology (BA). Of these, only economics majors are required to take statistics.

4 About 29 percent of all students taking statistics during the period covered by our data took the pre-requisite course elsewhere; most of those (about 27 percent of our sample) took it at a junior college.

5 This does not include students who dropped the course at some point during the semester; those students do not receive a letter grade at all.

6 "Advanced" math is (somewhat arbitrarily) defined here to include courses such as Calculus II and beyond. Basically, any math courses outside of the typical math sequence required for Business majors (or equivalent course substitutions) reported by students are considered advanced.

7 The GPA we use may not be a very good measure of a student's actual collegial academic performance because many students transfer courses to the university from other colleges, most often two-year junior colleges. These transferred credits do not impact the student's GPA calculation, which only takes into account courses completed in residence. While we do not suspect that this biases the GPA measure (on average) either upward or downward, it is worth keeping in mind that for some students, as many as 60 credit hours completed at another institution could, theoretically, be "off the record" vis-à-vis GPA calculation.

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