

FACTORS IMPACTING STUDENT SUCCESS IN INTRODUCTORY ECONOMICS COURSES

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Abstract

The study seeks to determine the impact of various individual and academic characteristics on grades earned in introductory economics courses. Students enrolled in these courses in a regional state university during 2015-16 were asked questions on topics such as the number of hours they work per week, whether or not they live on campus, their marital status, the educational background of their parents, involvement in various campus activities, the utilization of various campus services such as tutoring and advising, and their sources of funding for college. These data were then matched with registration and academic data available from the university for each of these students. The regression results show that high school (or college) GPA, standardized test scores, participation in an honors program, earned credit hours, and the use of own family funds or access to student loans were positively associated with academic performance. On the other hand, academic performance in introductory economics was negatively impacted by participation in the campus music and theater program and by taking classes in the afternoon or evening time slots. The results also show significant instructor effects on academic performance.

Key Words: achievement, engagement, factors impacting academic performance,

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Introduction

A number of factors impact academic success. As noted by Kuh, et al. (p. 5), “who students are, what they do prior to starting their postsecondary education, and where and how they attend college all can make a difference in their chances for obtaining a baccalaureate degree.” In this research, we hope to contribute to a better understanding of the contributing factors to college academic success. After a brief review of the literature, we discuss the data we have obtained for the analysis. Individual survey data was gathered from students in introductory economics classes in 2015-2016. Students were asked questions on topics such as the number of hours they work per week, whether or not they live on campus, their marital status, the educational background of their parents, involvement in various campus activities, utilization of various campus services such as tutoring and advising, and their sources of funding for college. These data were then matched with registration and academic data available from the university for each of these students. Results of ordered logit regressions as well as the marginal effects of the significant explanatory variables are then discussed.

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Review of the Literature

The research literature suggests that a number of factors impact academic success at the university level. Kuh, et al. (2006) conducted an extensive review of the literature as to what matters for student success in college. For these researchers, student success was not exclusively “academic success” but also was associated with such goals as “satisfaction,” “engagement in educationally purposeful activities,” and the “attainment of educational objectives.” As expected, a number of factors matter for student success. Rigorous preparation in elementary and secondary school is important. Adequate financial resources matter. Early intervention and sustained attention seem to help in keeping certain at-risk students enrolled. Students who find something or someone worthwhile to connect with at a college are more likely to achieve their academic goals. Academic programs that engage students such as first-year seminars, learning communities, undergraduate research programs, and effective academic advising all are positively linked to student success.

Carini, Kuh and Klein (2005) found that “student engagement” was an important predictor of academic success. These researchers found that student engagement was positively related to grade point average. For the purposes of their study, student engagement was measured by a number of factors such as the quality of relationships with faculty, institutional support, relationships with fellow students, and individual initiative. In an interesting finding, the researchers also concluded that low ability students (as measured by SAT scores) seemed to benefit the most by being engaged in a university. Strayhorn (2012) found that a “sense of belonging” can affect a college student’s academic performance. His definition of “a sense of belonging” refers to students’ perceived social support on campus, a feeling of connectedness, and the experience of mattering (p. 122). Involvement in various campus activities such as participating in student government, using campus recreational facilities, playing a team sport, socializing with faculty outside of class, membership in fraternities or sororities, and hours spent on out-of-class academic work were all positively related to a “sense of belonging.” Zacherman and Foubert (2014) found that some participation in cocurricular activities such as student government and intercollegiate sports was positively related to academic performance. However, as involvement in such activities exceeded 30 hours per week, students experienced a detrimental impact on their grades. The impact was most pronounced for male students.

Moore, et.al. (1998) conducted an extensive review of the research on student involvement in the college setting. The authors noted that a number of studies had found a positive relationship between involvement and student learning. In addition to having a positive impact on academic performance, involvement in extracurricular activities was an important factor in job placement and in the achievement of life goals. Somewhat surprisingly, the authors noted that the research literature found that involvement in a fraternity or sorority did not have a significant impact (positive or negative) on academic performance but such involvement was associated with other positive outcomes. Several studies mentioned in the paper did find that factors such as orientation classes, friendship with at least one faculty member, advising services, and learning communities were all positively associated with academic performance. In his research, Grubb (2006) specifically addressed the question “Does going Greek impair undergraduate academic performance?” The results were mixed. Controlling for a number of variables, fraternity males had lower GPAs vs. nonfraternity males while the effect of sorority

membership was much weaker. While Greek membership seemed to negatively impact GPAs, it likely has a positive impact on time to graduation. In another study, Soria, Fransen and Nackerud (2013) examined the impact of library use on student retention and academic success. Their results suggest that first-time, first-year undergraduate students who use the library have a higher GPA than non-library users. Zhao and Kuh (2004) examined whether participation in learning communities was linked to student success. They found that participation in learning communities was positively linked to academic performance and to the overall satisfaction with the college experience. In an interesting study focusing on underrepresented students, Gershenfeld, Hood and Zhan (2016) found that first semester GPA was a better predictor of college success (such as the six-year graduation rate) than measures such as an ACT score. In a study focusing on prior achievement and background, Anderson, Benjamin and Fuss (1994) found that the most important factors determining success in college introductory economics courses were high school grades in the final year of high school and whether or not a student completed a high school calculus class. These researchers also found that males outperformed females in college economics courses.

There has also been some empirical research on the impact of course scheduling on academic performance. Dills and Hernandez-Julian (2008) found that students performed best in late afternoon classes and in classes that meet more often (e.g. Monday/Wednesday/Friday as opposed to Monday/Wednesday or Tuesday/Thursday classes). Carrington (2010) concluded that academic performance in intermediate accounting courses was not statistically different for students enrolled in compressed courses (summer or one day per week) compared to two day per week regular semester courses. On the other hand, students on a three days per week schedule were significantly less successful in intermediate accounting compared to students taking more compressed offerings.

Another factor that is thought to impact academic achievement is the number of hours that a student works. Body, Bonnal and Giret (2014) found an adverse effect for students working more than 8 hours per week. However, the academic performance of students with more flexibility in their employment situation seems to be less impacted by the number of hours worked. Based on their empirical findings, the researchers suggested that additional financial aid along with more flexibility in class offerings might help students perform at a higher level in college. Kalenkowski and Pabilonia (2010) found that hours worked had a negative effect on GPA for first term students. The negative impact on academic achievement was much larger for students enrolled in two-year colleges (compared to four-year college students). On the other hand, Dundes and Marx (2006) found that the academic performance of undergraduates who worked 10-19 hours per week was superior to all other students.

Data

Our data come from two different sources. During the 2015-2016 academic year, students in the introductory economics courses of our university were surveyed. Three courses were included in the survey – Principles of Macroeconomics (ECON 2105), Principles of Microeconomics (ECON 2106) and Economics for Everyone (ECON 2100). In the surveys, students were asked questions about their employment, family background, commute times, campus involvement, and financial aid situation. A copy of the survey is included in the

appendix. The responses to these surveys were merged with academic data available from the university including the grade in the course, high school and college GPA, standardized test scores, total hours attempted, and major. Participation in this study was voluntary and followed all the guidelines of the university's Institutional Review Board (IRB).

For this paper we look at students in the Principles of Macroeconomics and Principles of Microeconomics courses. We have data on 637 students who took those courses in fall 2015 and spring 2016. However, we are not able to use all of these students in our regression analysis because some students are missing data for key variables. Some students in our sample do not have a standardized test score reported and many were missing a high school GPA. Some of the students also did not answer all the survey questions. Our final sample consisted of 520 students.² Of these 520 students, 56 students were first semester freshmen and therefore did not have a previous college GPA.

Table 1 reports the variable definitions and the descriptive statistics for the data of the 520 students in our sample. Our sample is relatively evenly split between the fall 2015 and spring 2016 semesters and between Principles of Macroeconomics and Principles of Microeconomics, with 55% of students in a fall course and 50% enrolled in Principles of Macroeconomics. The students in our sample were on average 19.7 years old and 46% of the sample were male while 38% were black. About 39% of our sample does not work either on or off campus while about 14% work more than 30 hours a week and 15% work a job on campus. Approximately 34% of the sample lived in a non-Greek resident hall and 42% lived off-campus but not with family. Of those that commuted to campus, 4% had commutes of 45 minutes or longer. The students in our sample participated in various campus activities. Twenty-two (22) percent of the sample have participated in a fraternity or sorority, 7% have been involved in a college music or theater group, while 4% and 5% of the sample have participated in the Student Government Association or the Student Activity Council, respectively. Sixty-one (61) percent of the sample report having attended a university event such as an athletic event or concert, and 56% have used the campus recreation center. Thirteen (13%) of the sample reported being part of the University's Honors College. In order to fund their college education, 57% reported using loans, 63% were using own or family funds, 56% were HOPE Scholarship recipients, and 40% reported having received a Pell Grant. The average SAT score of the students in our sample was 966 on the 1600 scale,³ and the 464 students in our sample who were returning college students had an average GPA at the start of the semester of 3.02. The students in our sample were taking on average 13.8 hours in the semester they were surveyed, and on average they had earned 34.7 credit hours at the start of the semester. Thirty (30) percent of our sample earned a grade of A in their principle of economics course, 32% received a B, 25% received a C, 11% a D and 2% an F. Since students had to be present in class in order to complete the survey in face-to-face classes,

² In addition to removing students with missing information, the data for one instructor was excluded since she only taught online courses and few of her students completed the survey. Following our institutional IRB Regulations, we also excluded any student who was under 18 at the time of the survey.

³ The standardized test scores in our data are the SAT score for students who have a SAT score reported. If students only had an ACT score reported, their ACT score was converted to an SAT score using the ACT-SAT concordance tables published in October 2009 (<http://www.act.org/content/dam/act/unsecured/documents/ACTCollegeBoardJointStatement.pdf>).

the grades in our sample are biased upward since weaker students are also less likely to attend class.

Table 1 Descriptive Statistics (N=520)

	Mean	Std. Dev.	Minimum	Maximum
ADVISOR <i>See advisor every semester</i>	0.9134615	0.2814283	0	1
AFTERNOON <i>Econ Class between noon & 5:00pm</i>	0.2423077	0.4288921	0	1
AGESTART <i>Age on first day of semester</i>	19.68654	1.729215	17	41
ATHLETE <i>NCAA Athlete</i>	0.05	0.2181548	0	1
ATTEND_EVENT <i>Attend university athletic event or concert</i>	0.6057692	0.4891554	0	1
BLACK <i>Race = Black</i>	0.3826923	0.4865122	0	1
BUSMAJOR <i>Business Major</i>	0.7480769	0.4345353	0	1
COMMUTE45TO60 <i>Commute 45-60 minutes</i>	0.0211538	0.1440356	0	1
COMMUTEOVER60 <i>Commute more than an hour</i>	0.0192308	0.1374674	0	1
DAD_BACHELOR <i>Dad's highest education = Bachelor Degree</i>	0.2346154	0.4241662	0	1
DAD_GRAD <i>Dad's highest education = Graduate Degree</i>	0.0980769	0.297705	0	1
DAD_SOME_HS_OR_LESS <i>Dad's highest education = Some HS or less</i>	0.0673077	0.2507954	0	1
EARNEDHRS <i>Total hours earned at start of semester</i>	34.71923	21.34852	0	148
EVENINGWORK <i>Works the Evening Shift</i>	0.3096154	0.4627802	0	1
EVENING_NIGHT <i>Econ Class meets after 5:00pm</i>	0.1615385	0.3683813	0	1
FALL <i>Econ class fall 2015</i>	0.55	0.4979728	0	1
FRATERNITY <i>Participated in Fraternity</i>	0.1	0.3002889	0	1
GRADE_GPA <i>Principles of Econ Grade in modified GPA terms</i>	2.780769	1.019093	1	4
GPASTART <i>College GPA at the start of the semester (n=464)</i>	3.023606	0.560835	1.6364	4
GREEK <i>Live in Greek housing</i>	0.0442308	0.2058054	0	1
HALF_SEM <i>Econ course was half semester</i>	0.0846154	0.2785765	0	1
HONORS <i>Student in the Honors College</i>	0.1307692	0.3374724	0	1

HOPE <i>Georgia Hope Scholarship recipient</i>	0.5615385	0.4966764	0	1
HSGPA <i>High school GPA</i>	3.264519	0.4795568	1.94	4
LEARNING_COMM <i>Participated in a learning community</i>	0.1423077	0.3497019	0	1
LOANS <i>Loans to fund school</i>	0.5711538	0.4953878	0	1
MACRO <i>Principles of Macro Course</i>	0.4961538	0.5004667	0	1
MALE <i>Gender = Male</i>	0.4576923	0.4986866	0	1
MARRIED <i>Relationship Status = Married</i>	0.0076923	0.0874519	0	1
MOM_BACHELOR <i>Mother's highest education = Bachelor Degree</i>	0.2615385	0.4398957	0	1
MOM_GRAD <i>Mother's highest education = Graduate Degree</i>	0.1384615	0.3457163	0	1
MOM_SOME_HS_OR_LESS <i>Mother's highest education = Some HS or less</i>	0.0461538	0.2100202	0	1
MUSIC_THEATER <i>Participated in college music or theater group</i>	0.0673077	0.2507954	0	1
NON_GREEK <i>Participated in non-Greek student organization</i>	0.2903846	0.454377	0	1
OFF_CAMPUS <i>Live off-campus but not with family</i>	0.4153846	0.4932627	0	1
ONCAMPUSJOB <i>Works a job on campus</i>	0.1480769	0.3555182	0	1
ONLINE <i>Econ course was online</i>	0.0480769	0.2141348	0	1
OVERNIGHT <i>Works overnight shift</i>	0.0346154	0.1829796	0	1
OWN_FAMILY_FUNDS <i>Funding college with own family funds</i>	0.625	0.4845891	0	1
PARENT <i>Parent of Child under 18</i>	0.0134615	0.1153513	0	1
PELL <i>Funding College with a Pell Grant</i>	0.4019231	0.4907587	0	1
PROF_REL_NONE <i>No professor mentors</i>	0.6346154	0.4820015	0	1
REC_CENTER <i>Has used campus rec. center</i>	0.5557692	0.4973585	0	1
RES_HALL <i>Live in on-campus residence hall</i>	0.3365385	0.4729805	0	1
SAC <i>Participated in the Student Activity Council</i>	0.0519231	0.2220854	0	1
SATACT <i>Standardized Test Scores converted to SAT scale</i>	966.25	129.2366	580	1460
SGA <i>Participated in Student Government</i>	0.0423077	0.201484	0	1

SORORITY <i>Participated in a Sorority</i>	0.1211538	0.3266202	0	1
TOTHR_CURRSEM <i>Total hours attempted current semester</i>	13.84038	2.206905	6	27
TUTORING_YES <i>Has used tutoring for core classes</i>	0.4961538	0.5004667	0	1
UWG_FAMILY <i>Parent or sibling UWG student or alum</i>	0.2211538	0.4154235	0	1
WORK30HRS <i>Work 30 or more hours</i>	0.1365385	0.3436901	0	1
WORKNONE <i>Not employed</i>	0.3884615	0.4878698	0	1
WORK_STUDY <i>Funded education with work study</i>	0.075	0.263645	0	1

Regression Results

Our results are presented in Tables 2 and 3. The regression results presented in Table 2 look at our entire sample of 520 students. However, since the literature suggests that college GPA is one of the best predictors of academic success, we also ran regressions on the 464 returning students so that we could include college GPA as a variable (see Table 3). For our dependent variable in each regression, we measure the student's success in the course using the student's course grade converted to a modified GPA scale (GRADE_GPA). A grade of A is represented by a 4, a grade of B is represented with a 3, a grade of C is represented with a 2, and a grade of D or F is represented with a 1. The grades of D and F were combined into one category because there were only 12 students in our sample of 520 that earned a grade of F. As mentioned earlier, this is likely the result of the in-class consent process, since the weakest students often do not attend class. In addition, the university does not consider a grade of D to truly be success in a course. When looking at student progression and retention issues, the university commonly looks at the DWF rate for the course, which measures the percentage of students who withdraw from the course or receive grades of D or F. While a grade of D is technically a passing grade at the university, a grade of D may still hold students back in terms of being able to take upper level courses or having a GPA high enough to graduate. Since our dependent variable is ordered, we estimate our regressions using an ordered logit model. Following Greene (1993), the equation to be estimated is:

$$y^* = \beta'x + \varepsilon$$

where y^* is an unobserved measure of student success in the principles of economics course. We observe the student's letter grade:

$$y = 1 \text{ (grade D or F) if } y^* \leq \mu_1$$

$$y = 2 \text{ (grade C) if } \mu_1 < y^* \leq \mu_2$$

$$y = 3 \text{ (grade B) if } \mu_2 < y^* \leq \mu_3$$

$$y = 4 \text{ (grade A) if } y^* > \mu_3$$

where μ are unknown threshold values that will be estimated. In this model, a positive and significant β coefficient indicates that a change in the independent variable increases the probability of getting an A in the course and decreases the probability of getting a D or F in the course while a negative and significant coefficient suggests that an increase in the independent variable would lower the probability of getting an A in the course and increase the probability of getting a D or F.

Looking first at the regression results in Table 2, which includes our whole sample of 520 students, we see that the probability of getting a high grade in a principles of economics course is positively and significantly related to several academic variables including high school GPA, standardized test scores, and total hours earned at the start of the semester (a measure of experience). In addition, students who participated in the honors college had a higher probability of succeeding in their economics course. Students who do not work or who work on campus also had a higher probability of getting a high grade in economics. However, working 30 or more hours did not have a significant impact on the probability of getting a high grade (or a low grade). Several of the sources of funding for education also had a positive and significant impact on the probability of getting a high grade in principles of economics courses. Financing your education with loans or your own or family funds had a positive and significant impact on the probability of success. This suggests that having a financial stake in your education may give a student an incentive to perform better. Students who used a state of Georgia HOPE scholarship as a funding source also had a higher probability getting a high grade. However, using a Pell Grant to fund your education did not have a significant impact on performance. Students taking Principles of Macroeconomics also had a higher probability of getting a high grade than student taking Principle of Microeconomics after controlling for instructor and other course related characteristics.

Table 2 also suggests that several of the variables had a negative and significant impact on the probability of getting a high grade (and increased the probability of getting a D or F). Participating in a music or theater activity on campus appears to lower the probability of getting a high grade. This may reflect the time involved in these activities, which may take away from the student's study time. None of the other campus activities variables appear to have had a significant impact on the probability of success in principles of economics courses. Most of the variables measuring the education level of the student's mother and father were not significant, although having a father with a graduate degree had a positive impact on a student's probability of success in their economics course. Taking an economics course in the afternoon or evening also lowers the probability of earning a high grade in principles of economics courses. We also include instructor dummy variables, several of which are significant. This suggests that it may be more difficult to get a high grade in courses taught by certain instructors, indicating that some instructors may be tougher graders or have more difficult courses than others.

The regression in Table 2 does not include college GPA as an explanatory variable since first semester freshmen did not have GPA at the start of the semester when they took their principles of economics course. However, other researchers have found that success in previous college courses is a strong predictor of future success (Gershenfeld, et al. 2016). In Table 3, we summarize the results of the model excluding first semester freshmen and including college GPA

at the start of the semester⁴. As expected, college GPA is positive and significant. Most of the other variables performed the same as in the regression that included first semester freshmen (Table 2). However, there were a few variables that were significant in the regression that controls for college GPA that were not significant in the previous regression. The total hours being taken in the current semester was negative and significant in this regression, suggesting that taking more credit hours lowers the probability of getting a high grade in principles of economics. Having taken economics in the fall was negative and significant in this regression, suggesting that students who took the course in the fall had a lower probability of success. Having a mother with a graduate degree had a negative and significant impact on the probability of success, but having a father with a graduate degree was not significant in this regression. Taking the course in a half semester format was positive and significant. Having used the Georgia HOPE scholarship to fund your education was not significant in the regression that excludes first semester freshman, suggesting that some of the information from that variable may be picked up in the college GPA variable. Working an on-campus job did not have a significant impact on the probability of success in the course in this regression while participating in the work study program was negative and significant.

In addition to calculating the regression coefficients from the ordered logit regression, the average marginal effect of the significant variables on earning an A, B, C or D/F were also estimated and are presented in Tables 4 and 5. The interpretation of the estimated marginal effects depends on whether the variable is continuous (such as GPA, hours, or standardized test scores) or whether the variable is a binary indicator (such as whether the student is taking macroeconomics or is in the honors college). For continuous variables, the average marginal effects provide an approximation of the impact of a one unit change in x on a student's probability of getting a particular grade in the course, holding the other variables constant. For binary indicator variables, the average marginal effect provides an estimation of how the probability of getting a particular grade changes on average as the indicator changes from zero to one.⁵

Table 4 shows the marginal effects for the variables that were significant in the ordered logit regression for the full sample, which includes first semester freshmen. The continuous variables in this table are high school GPA (HSGPA), standardized test scores (SATACT), and the number of earned hours (EARNEDHRS). The estimated average marginal effects indicate that a one unit (one point) change in high school GPA decreases the probability of a student getting a D or F on average by 0.0981 or 9.81 percentage points and increases the probability of a student getting an A on average by 0.1411 or 14.11 percentage points. The marginal impact of

⁴ Our measure of college GPA at the start of the semester is taken from the student's academic records. The university allows students to retake courses and replace their previous grades with the most recent grade. When a course is replaced, the past semester GPAs on the student's transcripts and hours earned are recalculated to reflect the impact of the grade replacement. Our data reflects the GPA and hours earned at the start of the semester as reflected on the student's transcript at the time we received the data from the university and will reflect any grade replacements between the start of the semester and when we received the academic data from the university.

⁵ For categorical indicator variables such as instructor or works hours, the average marginal effects calculation accounts for the fact that the students can only be in one category at a time. For example, a student can't be assigned to two different instructors for the same class.

standardized test scores indicates that a one unit (one point) increase in the standardized test score (SATACT) decreases the probability of getting a D or an F on average by 0.04 percentage points and increases the probability of getting an A on average by 0.05 percentage points. A one unit (one hour) increase in earned hours will decrease the probability of getting a D or an F on average by 0.11 percentage points and will increase the probability of getting an A by 0.16 percentage points. Looking at the indicator variables, the biggest marginal impact on the probability of getting a D or an F in principles of economics appears to come from instructor effects. Taking the class from instructor 3 or instructor 5 raises the probability on average of getting a D or an F by 31.41 percentage points and 28.75 percentage points respectively. On the other hand, taking the course from instructor 6 or instructor 7 lowers the probability of getting a D or an F by 16.91 percentage points and 10.50 percentage points respectively. Participating in a music or theater activity or taking the class in the afternoon or evening also increases the probability of getting a D or an F on average by 10 percentage points or more. Taking macroeconomics (rather than microeconomics) and having been a Hope Scholarship recipient lowered the probability on average of getting a D or an F by more than 10 percentage points. Taking a macroeconomics course, participating in the honors college, or taking the class from instructor 6 had the largest positive impact on the probability of getting an A, increasing the probability on average by 20.92 percentage points, 22.24 percentage points, and 46.28 percentage points respectively. The largest negative average marginal effects on getting an A came from taking the class in the evening or taking the class from instructor 3 or 5. In most cases the average marginal effects tended to be smaller in magnitude and less likely to be significant in their impact on the probability of a student getting a B or a C in their principles of economics course.

The marginal effects in Table 5, for the sample without first semester freshmen, are similar to the marginal effects for the larger sample. One difference in this table is the presence of college GPA. The average marginal effects estimate indicates that college GPA has a much larger impact on the probability of success and failure in the principles of economics course than high school GPA. For example, a one unit (one point) increase in college GPA decreases the probability of getting a D or an F in course on average by 20.12 percentage points and increases the probability of getting an A in the course by 27.28 percentage points while a one point increase in high school GPA only decreases the probability of getting a D or an F on average by 5.22 percentage points and only increases the probability of getting an A on average by 7.08 percentage points.

Table 2 Ordered Logistic Regression, Dependent Variable GRADE_GPA Full Sample (N=520)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
AGESTART	0.0734649	0.0806993	0.91	0.363
HSGPA	1.198954	0.271533	4.42	0***
MALE	0.1187882	0.2224517	0.53	0.593

BLACK	-0.237737	0.2608107	-0.91	0.362
WORK30HRS	-0.1988068	0.3007635	-0.66	0.509
WORKNONE	0.7102173	0.2605855	2.73	0.006***
ONCAMPUSJOB	0.5981651	0.355165	1.68	0.092*
EVENINGWORK	0.1538403	0.2471765	0.62	0.534
OVERNIGHT	-0.0339962	0.5618978	-0.06	0.952
WORKSTUDY	-0.3483692	0.4215202	-0.83	0.409
TUTORING_YES	-0.2219807	0.2042446	-1.09	0.277
PROF_REL_NONE	-0.0246371	0.2108709	-0.12	0.907
FRATERNITY	0.1777819	0.3748451	0.47	0.635
SORORITY	0.0563689	0.343721	0.16	0.87
SAC	-0.0222988	0.4691287	-0.05	0.962
SGA	-0.0305063	0.5003301	-0.06	0.951
NON_GREEK	-0.025835	0.2190631	-0.12	0.906
LEARNING_COMM	0.0647459	0.2757008	0.23	0.814
MUSIC_THEATER	-1.195687	0.3906097	-3.06	0.002***
ATHLETE	-0.1789853	0.4355678	-0.41	0.681
ATTEND_EVENT	-0.1778489	0.2311556	-0.77	0.442
HONORS	1.624357	0.3835909	4.23	0***
REC_CENTER	0.0848014	0.2230449	0.38	0.704
MACRO	1.900541	1.024748	1.85	0.064*
BUSMAJOR	0.088849	0.2330476	0.38	0.703
TOTHR_CURRSEM	-0.0054582	0.0495649	-0.11	0.912
DAD_SOME_HS_OR_LESS	0.30888	0.4280532	0.72	0.471
DAD_BACHELOR	-0.2643935	0.2588971	-1.02	0.307
DAD_GRAD	0.6287073	0.3737157	1.68	0.093*
MOM_SOME_HS_OR_LESS	0.1213668	0.4969579	0.24	0.807
MOM_BACHELOR	0.1351115	0.2440837	0.55	0.58
MOM_GRAD	-0.2144894	0.3126909	-0.69	0.493
RES_HALL	-0.0170828	0.3540142	-0.05	0.962

GREEK	-0.6644721	0.5811043	-1.14	0.253
OFF_CAMPUS	0.1579777	0.3096445	0.51	0.61
ONLINE	0.1491116	0.623559	0.24	0.811
HALF_SEM	1	0.6641812	1.51	0.132
COMMUTE45TO60	0.3430847	0.6875072	0.5	0.618
COMMUTEOVER60	-0.5242613	0.617884	-0.85	0.396
AFTERNOON	-1.244762	0.5561454	-2.24	0.025**
EVENING_NIGHT	-1.650783	0.6975104	-2.37	0.018**
ADVISOR	0.4922113	0.3371117	1.46	0.144
HOPE	1.389068	0.2365279	5.87	0***
PARENT	-1.321003	0.8161039	-1.62	0.106
UWG_FAMILY	0.0810828	0.2454443	0.33	0.741
PELL	0.2556972	0.2143361	1.19	0.233
OWN_FAMILY_FUNDS	0.4691396	0.2160095	2.17	0.03**
LOANS	0.6930045	0.2318715	2.99	0.003***
SATACT	0.0046545	0.0009714	4.79	0***
FALL	-0.3907046	0.3096814	-1.26	0.207
EARNEDHRS	0.0134556	0.0061555	2.19	0.029**
MARRIED	-0.5241117	1.222126	-0.43	0.668
INSTRUCTOR1	0.9609558	0.8378436	1.15	0.251
INSTRUCTOR2	-0.0444057	0.8016009	-0.06	0.956
INSTRUCTOR3	-2.51131	0.7156429	-3.51	0***
INSTRUCTOR4	0.3131236	0.7871902	0.4	0.691
INSTRUCTOR5	-2.318563	0.8329787	-2.78	0.005***
INSTRUCTOR6	3.576282	0.9880061	3.62	0***
INSTRUCTOR7	1.38009	0.6692121	2.06	0.039**
μ_1	10.32899	2.468229		
μ_2	12.48958	2.484555		
μ_3	14.87268	2.51264		

Pseudo R2	0.286			
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*** Significance at the 0.1 level

** Significance at the 0.5 level

* Significance at the .10 level

Table 3 Ordered Logistic Regression, Dependent Variable GRADE_GPA No First Semester Freshmen (N=464)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
GPASTART	2.781446	0.3215956	8.65	0***
AGESTART	0.0669303	0.0924236	0.72	0.469
HSGPA	0.7222605	0.3149055	2.29	0.022**
MALE	0.1811649	0.2518605	0.72	0.472
BLACK	-0.215476	0.2951353	-0.7	0.465
WORK30HRS	-0.2835951	0.3204826	-0.9	0.376
WORKNONE	0.7271525	0.2938267	2.47	0.013**
ONCAMPUSJOB	0.5570614	0.3880353	1.44	0.151
EVENINGWORK	0.2732396	0.2709801	1.01	0.313
OVERNIGHT	-0.1957989	0.5973836	-0.3	0.743
WORK_STUDY	-0.9953167	0.4757574	-2.1	0.036**
TUTORING_YES	-0.0709859	0.2256546	-0.3	0.753
PROF_REL_NONE	-0.0236531	0.2367375	-0.1	0.92
FRATERNITY	0.1294735	0.4136026	0.31	0.754
SORORITY	-0.0916833	0.3820446	-0.2	0.81
SAC	0.0109078	0.4863789	0.02	0.982
SGA	-0.0691572	0.5273236	-0.1	0.896
NON_GREEK	-0.0688091	0.233095	-0.3	0.768
LEARNING_COMM	-0.0574211	0.2915491	-0.2	0.844
MUSIC_THEATER	-1.119161	0.4237452	-2.6	0.008***
ATHLETE	-0.0505629	0.5002414	-0.1	0.919
ATTEND_EVENT	0.0432721	0.2556508	0.17	0.866
HONORS	1.1571	0.444211	2.6	0.009***

REC_CENTER	-0.0273409	0.2514503	-0.1	0.913
MACRO	2.292052	1.173404	1.95	0.051*
BUSMAJOR	0.3181012	0.2705848	1.18	0.24
TOTHR_CURRSEM	-0.0984543	0.0545714	-1.8	0.071*
DAD_SOME_HS_OR_LESS	0.3237324	0.467894	0.69	0.489
DAD_BACHELOR	-0.2047111	0.2873237	-0.7	0.476
DAD_GRAD	0.474179	0.4184059	1.13	0.257
MOM_SOME_HS_OR_LESS	-0.1662679	0.5636178	-0.3	0.768
MOM_BACHELOR	0.0300613	0.2747801	0.11	0.913
MOM_GRAD	-0.5753843	0.3467498	-1.7	0.097*
RES_HALL	0.367644	0.402574	0.91	0.361
GREEK	-0.6380615	0.6175933	-1	0.302
OFF_CAMPUS	0.448605	0.3497796	1.28	0.2
ONLINE	0.5261565	0.6825247	0.77	0.441
HALF_SEM	1.440279	0.7860849	1.83	0.067*
COMMUTE45TO60	-0.2882024	0.7423425	-0.4	0.698
COMMUTEOVER60	-0.0663865	0.7664578	-0.1	0.931
AFTERNOON	-1.417396	0.5606622	-2.5	0.011**
EVENING_NIGHT	-1.894845	0.7280937	-2.6	0.009***
ADVISOR	0.4521394	0.3860098	1.17	0.241
HOPE	0.3984949	0.2918254	1.37	0.172
PARENT	-1.536307	1.018979	-1.5	0.132
UWG_FAMILY	-0.1581607	0.2827952	-0.6	0.576
PELL	0.1612291	0.2419495	0.67	0.505
OWN_FAMILY_FUNDS	0.4669005	0.2445034	1.91	0.056*
LOANS	0.8569521	0.2678913	3.2	0.001***
SATACT	0.0038326	0.0011272	3.4	0.001***
FALL	-0.5736683	0.3474169	-1.7	0.099*
EARNEDHRS	0.0165429	0.0074697	2.21	0.027**
MARRIED	-1.625912	1.399125	-1.2	0.245

INSTRUCTOR1	1.32799	1.010695	1.31	0.189
INSTRUCTOR2	-0.0188227	0.943139	-0	0.984
INSTRUCTOR3	-3.523294	0.7567301	-4.7	0***
INSTRUCTOR4	-0.0502486	0.8310903	-0.1	0.952
INSTRUCTOR5	-2.812246	0.874334	-3.2	0.001***
INSTRUCTOR6	4.054109	1.126252	3.6	0***
INSTRUCTOR7	1.883593	0.7863027	2.4	0.017**
μ_1	14.40428	2.877212		
μ_2	16.86877	2.903221		
μ_3	19.60884	2.94726		
Pseudo R2	0.3629			

*** Significance at the 0.1 level

** Significance at the 0.5 level

* Significance at the .10 level

	Grade D or F		Grade C		Grade B		Grade A	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
HSGPA	-0.0981***	0.0223	-0.0657***	0.0158	0.0226***	0.0075	0.1411***	0.0315
WORKNONE	-0.0560***	0.0202	-0.0399***	0.0149	0.0110**	0.0046	0.0849***	0.0312
ONCAMPUSJOB	-0.0446*	0.0239	-0.0353	0.0224	0.0064**	0.0031	0.0734	0.0452
MUSIC_THEATER	0.1179***	0.0443	0.0504***	0.0125	-0.0440**	0.0205	-0.1243***	0.0351
HONORS	-0.0950***	0.0161	-0.1118***	0.0288	-0.0156	0.0167	0.2224***	0.0566
MACRO	-0.1592*	0.0862	-0.0733***	0.0195	0.0232***	0.0078	0.2092**	0.1002
DAD_GRAD	-0.0456*	0.0242	-0.0375	0.0242	0.0052	0.0034	0.0779	0.0482
AFTERNOON	0.1073**	0.0514	0.0479***	0.0127	-0.0187**	0.0093	-0.1365**	0.0545
EVENING_NIGHT	0.1509**	0.0699	0.0553***	0.0103	-0.0315**	0.0138	-0.1747***	0.0637
HOPE	-0.1123***	0.0197	-0.0918***	0.0187	0.0320***	0.0100	0.1722***	0.0295
OWN_FAMILY_FUNDS	-0.0388**	0.0182	-0.0260**	0.0122	0.0097*	0.0055	0.0551**	0.0250
LOANS	-0.0584***	0.0202	-0.0344***	0.0109	0.0134**	0.0059	0.0794***	0.0254
SATACT	-0.0004***	0.0001	-0.0003***	0.0001	0.0001***	0.0000	0.0005***	0.0001
EARNEDHRS	-0.0011**	0.0005	-0.0007**	0.0003	0.0003*	0.0001	0.0016**	0.0007
INSTRUCTOR3	0.3141***	0.0705	0.0046	0.0296	-0.1346***	0.0246	-0.1841***	0.0502
INSTRUCTOR5	0.2875***	0.0902	0.0107	0.0305	-0.1225***	0.0315	-0.1757***	0.0561
INSTRUCTOR6	-0.1691***	0.0566	-0.2036***	0.0233	-0.0901***	0.0323	0.4628***	0.0765
INSTRUCTOR7	-0.1050**	0.0463	-0.0753	0.0521	0.0122	0.0178	0.1682*	0.0869

*** Significance at the 0.1 level

** Significance at the 0.5 level

* Significance at the .10 level

Table 5 Marginal Effects of Significant Variables for the Sample without First Semester Freshmen (n=464)

	Grade D or F		Grade C		Grade B		Grade A	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
GPASTART	-0.2012***	0.0243	-0.1289***	0.0185	0.0573***	0.0138	0.2728***	0.0279
HSGPA	-0.0522**	0.0227	-0.0335**	0.0152	0.0149**	0.0074	0.0708**	0.0306
WORKNONE	-0.0502**	0.0197	-0.0352**	0.0147	0.0126**	0.0053	0.0728**	0.0296
WORK_STUDY	0.0820*	0.0440	0.0374***	0.0136	-0.0285	0.0174	-0.0908**	0.0396
MUSIC_THEATER	0.0947**	0.0404	0.0403***	0.0119	-0.0345**	0.0169	-0.1005***	0.0345
HONORS	-0.0681***	0.0206	-0.0649**	0.0286	0.0056	0.0073	0.1274**	0.0531
MACRO	-0.1627**	0.0813	-0.0804***	0.0213	0.0277***	0.0086	0.2154**	0.1012
TOTHR_CURRSEM	0.0071*	0.0039	0.0046*	0.0026	-0.0020*	0.0012	-0.0097*	0.0053
MOM_GRAD	0.0445	0.0283	0.0245*	0.0136	-0.0145	0.0102	-0.0545*	0.0317
HALF_SEM	-0.0813**	0.0328	-0.0785*	0.0465	0.0045	0.0141	0.1553*	0.0908
AFTERNOON	0.1080**	0.0451	0.0453***	0.0120	-0.0250**	0.0110	-0.1283***	0.0457
EVENING_NIGHT	0.1529**	0.0638	0.0522***	0.0101	-0.0394***	0.0147	-0.1657***	0.0557
OWN_FAMILY_FUNDS	-0.0340*	0.0180	-0.0219*	0.0117	0.0105*	0.0061	0.0455*	0.0237
LOANS	-0.0640***	0.0206	-0.0357***	0.0106	0.0182***	0.0068	0.0816***	0.0242
SATACT	-0.0003***	0.0001	-0.0002***	0.0001	0.0001***	0.0000	0.0004***	0.0001
FALL	0.0414*	0.0248	0.0260*	0.0158	-0.0108*	0.0065	-0.0566*	0.0343
EARNEDHRS	-0.0012**	0.0005	-0.0008**	0.0003	0.0003**	0.0002	0.0016**	0.0007
INSTRUCTOR3	0.3710***	0.0563	-0.0026	0.0297	-0.1437***	0.0241	-0.2248***	0.0453
INSTRUCTOR5	0.2893***	0.0763	0.0168	0.0302	-0.1088***	0.0254	-0.1973***	0.0532
INSTRUCTOR6	-0.1634***	0.0576	-0.1878***	0.0234	-0.0915***	0.0253	0.4427***	0.0721
INSTRUCTOR7	-0.1145***	0.0431	-0.0842	0.0528	-0.0020	0.0244	0.2008**	0.0903

*** Significance at the 0.1 level

** Significance at the 0.5 level

* Significance at the .10 level

Conclusions

The regression results in the two models presented in this paper show a consistent relationship between a number of independent variables and the likelihood of earning a high grade in an introductory economics class. Students with a high GPA (either high school or college) or a high standardized test score were more likely to have earned a high grade. In addition, students who did not work were more likely to have performed better in introductory economics courses. Other independent variables positively associated with the likelihood of a successful academic outcome were participation in the university honors program, making use of student loans or own family funds to pay for college, earned hours prior to the start of the semester, and taking a macroeconomics principles course. The independent variables that negatively impacted academic performance in both models were taking economics in the afternoon or evening and participation in the music/theater program. It is interesting that certain independent variables were never significant in the models. These included race, gender, commuting time, participation in campus activities (with the exception of music/theater), membership in a fraternity or sorority, working more than 30 hours per week and a relationship with a professor. The results do show significant instructor effects on grades. The calculated marginal effects show that college GPA has a much greater impact on the probability of success than high school GPA and that taking a class from a particular instructor can significantly increase (or decrease) the probability of getting a poor grade in an introductory economics class.

The results provide some potentially useful information for academic advisors and students. First, our data analysis suggests that it is best not to work at all, if possible. If you must work, it is best to work on campus. Secondly, participation in the Honors Program has a positive effect on academic performance (even while controlling for GPA and standardized test scores). Any eligible student should be encouraged to participate in such a campus program. In addition, financing your education with loans or your own or family funds had a positive and significant impact on the probability of success. This suggests that having a financial stake in their education may give a student an incentive to perform better. Our research also shows that afternoon and evening classes do not seem to be the best class time options for academic success. This may be a unique situation for this university as students may have had no choice but to enroll in these classes as other more preferable class selections (late morning or online) tend to fill up rapidly. This is a concern particularly for students with the fewest completed academic hours as these individuals are the last in line to sign up for classes under our university registration system. The only consistently significant campus involvement variable was whether or not a student participated in the music/theater program. It's possible that participation in music and/or theater programs is such a time-consuming endeavor that it negatively impacts grades in courses such as introductory economics. One way to offset such an outcome might be an increase in scholarship funding for such students so that they will not have to work as much to support their way through college. Instructor effects were also significant, suggesting that students may benefit from examining their faculty options and choosing to take the course from an instructor who best fits their learning style and academic goals.

The conclusions of this study are clearly limited as we examined only academic performance in introductory economics at a single university. In addition, the sample contains only those students who attended class on the day in which the survey instrument was distributed

and who also agreed to participate in the study. It would clearly be useful to expand this research to look at how various factors impact academic performance in non-economics courses as well as at other universities. However limited the results might be, they do provide some guidance to both students and advisors as they seek to improve academic outcomes.

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Appendix – Student Background Survey

1. How many hours do you work for pay OFF campus?
 None
 1-9 hours per week
 10-19 hours per week
 20-29 hours per week
 30-39 hours per week
 40 or more hours per week

2. How many hours do you work for pay ON campus?
 None
 1-9 hours per week
 10-19 hours per week
 20-29 hours per week
 30-39 hours per week
 40 or more hours per week

3. If you answered yes to question 1 or question 2, when do you primarily work?
 Daytime (approximately 8:00 am-5:00 pm)
 Evening (approximately 5:00 pm- 12:00 midnight)
 Overnight shift (approximately 12:00 midnight -8:00 am)

4. Where do you currently live?
 A residence hall
 The Greek Village
 Off-campus housing (not at home with family)
 At home with family

5. How long does it take to get from your apartment or house to campus?
 Zero (I live on campus)
 I live close to campus so I am able to walk, ride a bike or take the campus bus
 less than 10 minutes driving
 11-20 minutes driving
 21-30 minutes driving
 31-45 minutes driving
 45-60 minutes driving
 more than 60 minutes driving

6. Do you have internet access at your primary residence?
 Yes
 No

7. What is your relationship status?
 Single
 Married
 In a committed relationship

8. Are you an international student?

Yes

No

9. Are you the parent of child under the age of 18?

Yes

No

10. If you answered yes to question 9, indicate how many children you have.

1

2

3

4 or more

11. Are you the primary care giver of a sibling (brother or sister) under 18?

Yes

No

12. What is the highest level of education attained by your mother?

Some high school

High school graduate

Some college

Associate's degree

Bachelor's degree

Graduate Degree

13. What is the highest level of education attained by your father?

Some high school

High school graduate

Some college

Associate's degree

Bachelor's degree

Graduate Degree

14. Do you have a parent or a sibling who is a current student at UWG or an UWG alumni?

Yes

No

15. Have you participated in any of the following activities since you have been a UWG student? (check all that apply)

- Student Government Association (SGA)
- Student Activities Council (SAC)
- Fraternity or Sorority
- Non-Greek student organization (religious group, intramurals, campus clubs, etc.)
- Learning Community
- Musical ensemble, marching band or campus theater group
- Attended a UWG athletic event or an on-campus concert
- NCAA athlete
- Student in the Honors College
- Utilize the Campus Recreation Center

16. How many professors have you gotten to know outside of the classroom (as a mentor or friend)?

- None
- 1
- 2
- 3
- 4
- 5 or more

17. Do you see an academic advisor every semester?

- Yes
- No

18. Have you ever used the tutoring services for core curriculum classes offered through the Center for Academic Success?

- Yes, I have used the tutoring services
- No, I have not used the tutoring services but I knew they were available
- I did not know tutoring services were available

19. How are you funding your way through school? (check all that apply)

- Own/Family Funds
- HOPE Scholarship
- Pell Grant
- Federal Work Study
- Loans
- Athletic Scholarship
- Scholarships (other than Hope or Athletic)
- UWG Tuition Assistance Program (TAP for UWG Employees)
- Military Assistance (GI Bill, Tuition Support, etc.)

20. For tuition purposes, are you considered to be a Georgia resident (pay in-state tuition)?

- Yes
- No