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EMPLOYMENT AND THE ACADEMIC PERFORMANCE OF UNDERGRADUATE BUSINESS STUDENTS

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ABSTRACT

The number of college students working during their undergraduate careers continues to increase. Faculty members often feel that working too many hours has a negative effect on students' academic performances. Research results examining this assumption remain largely mixed. This study, involving 303 working business students at a medium size mid-southern public university, does not find any relationship between the number of hours worked per week and academic performance as measured by GPA for the fall 2008 semester. Past academic performance measured by cumulative GPA is the strongest predictor of current academic performance regardless of all the other factors studied.

INTRODUCTION

It has become commonplace for many full-time, as well as part-time, students to work during some, if not all, of their undergraduate college careers. Gose (1998) reported survey results in 1998 that indicated 39% of freshman college students worked at least 16 hours per week. This represented a 4% increase over 1993 figures. More recent literature suggests that the percentage of full-time university students with jobs is now probably over 50% in the United States (Bennett et al., 2007; Bradley, 2006; Hawkins et al., 2005; Miller et al., 2008; Nonis and Hudson, 2006). This situation is also prevalent in other countries (Bradley, 2006; Callender, 2008; Holmes, 2008). Perhaps financial pressures from continually rising tuitions and fees are contributing to this trend of increasing employment during higher education. Other factors leading to more working students may include academic mandates for internship participation and the desire to gain social work experiences.

PREVIOUS RESEARCH

Observing late working students sleeping during class and listening to their pleas for extensions of due dates and make-up exams could lead to a generalized perception that working has a negative effect on students' academic performances. Associated with this perception of the influence of working on academic performance is the notion that time spent working potentially takes away from time spent studying. Nonis and Hudson (2006) cited inconclusive previous work on a relationship between studying and academic performance in looking at both time spent studying and time spent working and their effects on academic performance. Evidence for a positive relationship with studying was found by McFadden and Dart (1992), no relationship by Mouw and Khanna (1993), and less free time leading to higher GPAs by Ackerman and Gross (2003). The hypothesis of a relationship between time spent studying outside of class and GPA was not supported by the study of Nonis and Hudson (2006). Therefore, this study makes no assertions about study time versus

working time and does not attempt to investigate this underlying issue.

While many studies have been based on the assumption of potential negative employment impacts, it has also been documented that working can have a *perceived* positive impact on academic performance as well (Holmes, 2008). Light (2001, pp.27) also asserts that there is no signification relationship between time spent on working and academic performances in college. Additionally, studies seeking to imply cause and effect relationships between working and academic performance can be complex to compare due to their specific sample demographics, use of non-objective self-reported predictors, and a lack of linkage to past academic performance.

Despite these difficulties and speculation as to the factors leading to more students being employed, there exists a continuing interest to investigate the possible effect of working on students' academic performances (Nonis and Hudson, 2006; Stinebrickner and Stinebrickner, 2003; Svanum and Bigatti, 2006).

As previously mentioned, Nonis and Hudson (2006) examined the effects of both the time spent studying and the time spent working on the academic performances of 264 business students at a medium-sized Association to Advance Collegiate Schools of Business (AACSB) accredited, public university in the mid-southern United States. Academic performance was objectively measured by obtaining the students' semester GPAs from university records and matching them up to other reported data for working and studying, as well as other factors of interest. Their findings found no significant relationships between either the time spent on academic activities (studying) or the time spent working, and students' academic performances as represented by their corresponding semester GPAs. This outcome did not contradict another study that actually found positive relationships between working and GPA (Strauss and Volkwein, 2002). Strauss and Volkwein (2002) indicated that perhaps students that work hard at jobs also bring that work ethic to school.

Conversely, Hawkins et al. (2005) investigated the potential relationship of the number of hours worked (and the perceived interference with studies this created) and overall GPA using a sample of 300 undergraduate social work majors from two universities. They found these factors to be statistically significant negative predictors of

GPA. It must be noted that in this study, both the independent and dependent variables were self-reported.

Svanum and Bigatti (2006) looked at *The Influences of Course Effort and Outside Activities on Grades in a College Course*. They concluded that the demands of working lessened the amount of effort students were able to expend on the course and therefore lessened their "GPA-indexed potential for course success." An interesting aspect of their discussion concerned the possibility that the negative effect on overall GPA of lessening course effort by working could be greater over time for average students than above average students.

Miller et al. (2008) examined health risks related to working while in college. In a sample of 903 students at a southeastern US university, lower academic performance was significantly associated with working 20 or more hours per week. In this study, overall GPA was self-reported and separated into good (3.0 and above) and less than good (below 3.0) categories only.

Furr and Elling (2000) predicated their investigation of off-campus work and student development on previous research indicating moderate amounts of employment are beneficial to higher academic achievement, while working full-time is negatively associated with GPA, and many other factors. A total of 361 telephone interviewed undergraduate students were included in the analysis of collected data. An important finding of this study brings together subjective self-reported data and objective quantifiable data. While students indicated a significant perceived negative impact of their work schedules on their academic progress, this was not supported by the quantitative data. There was no significant relationship between the number of hours worked off-campus and cumulative GPA.

Internationally, research results have also been somewhat contradictory. Bradley (2006) found in his sample of 246 Australian university students that approximately 85 % had paid employment during the semester researched (This is similar to a recent national survey by Devlin et al. (2007) indicating that 72.3 % of undergraduates were employed during the semester of the survey and 85.1 % had been employed in the last 12 months. This was one of the greatest rates found in the literature reviewed.). While the perceived negative effects of working increased with the number of hours

worked, there was no support for lesser academic performance in terms of GPA among students working at least 20 hours per week. In fact, non-significant results suggested that grades were highest for non-working students and the students working more than 20 hours per week. Evidence of the trend for a positive correlation of GPA with job satisfaction may have contributed to this unexpected outcome for students working many hours.

In a study involving 296 full-time undergraduate English students and focused more on the work itself, few students reported any perceived negative impact on their studies from working (Curtis and Lucas, 2001).

Callender (2008) attempted to control for students' "academic attainment on entry to higher education and other factors including their hours of work" in examining the impact of paid employment on grades and degree results for 1012 students at six UK universities. The study concluded that working had negative effects on both aspects investigated and that these effects increased with the number of hours worked. These negative effects were considered to have long term as well as short term consequences for students, resulting in lower paid jobs upon graduation and harm to their careers.

RESEARCH OBJECTIVE

Just as indicated in the previously cited research, the majority of students in the College of Business Administration at the authors' university seem to be employed either part time or full time. It is commonly discussed among faculty members of the college that many students attempt full course load academic schedules while concurrently working a significant number of hours. Of most concern to faculty are the students moving from lower-level (freshman/sophomore) courses to their major and upper-level (junior/senior) business core courses. Continuing to be successful at the upper level, while working 30-40 hours per week, is difficult. At least the perception of the faculty is that the combination of an extensive employment workload and a heavy academic workload leads to poorer academic performance. The necessity of many students to be enrolled in a minimum of twelve credit hours to remain

on their parent's insurance, or to receive financial aid, further exacerbates the pressure on them to not reduce the number of credit hours attempted while working. Considering the mixed results of previous research on the possible negative impact of working on academic performance, the objective of this study is to further investigate the possibility of a relationship between employment and the academic performance of business students.

METHOD

Factors taken from the literature and originally developed were employed to gather data using a survey instrument. The factors included demographics, current academic performance, past academic performance, and working information. Working characteristics encompassed not only how much students worked, but the nature of their employment and why they worked.

The survey was administered during the 9th week of the fall 2008 semester after having been informally piloted utilizing both faculty and students of the college of business. Some minor changes in wording were made to several of the items for clarity in obtaining the intended responses.

The target population consisted of the approximately 1,000 students of the college. Cooperation was sought from faculty colleagues in distributing and collecting the surveys. Completion of a survey by a student was totally voluntary. No incentives were offered except for the promise to share the results with them. It was necessary to ask them for identifying information in order to obtain their cumulative and semester GPAs from university records at the end of the fall semester.

The fall semester GPA was used as the academic performance variable of interest in comparing it with the other demographic and working factors for which data was obtained to determine any relationship between them and academic performance. Initially, ANOVA tests were conducted among the variables looking for potential significant relationships. This included examining working and non-working student groups for any significant differences. Using the information on potential covariates obtained from the ANOVA

tests, analysis was then conducted using step-wise multiple regressions to test the controls following different sequences of factors of demographics, academic standing and past performance, working motivation, job characteristics, and working intensity as defined by the number of hours worked per week.

The research design included several original elements to expand upon and contribute to an enhanced understanding of working and academic performance among college business students. Academic standing (i.e. freshman, sophomore, junior, and senior) was incorporated to examine how working affects students at stages of their academic careers. This was based on the previously mentioned feeling among faculty that for most students in business administration, course work tends to be more difficult in the upper-level courses (e.g. team projects, progression in the major) than that in lower-level courses where students focus more on textbooks for assessment. The authors expected to see less negative effects of employment on lower-level (freshmen/sophomore) students versus upper-level (junior/senior) students.

Additionally, data was collected on students' majors. Since both students and faculty consider some majors more challenging than others, it was expected that the negative effects of working would be significantly related to some majors.

It was also desired to see if the reasons students work are related to their academic performance. It was thought this might help explain the positive relationship between work and academic performance reported in some past studies. Working to gain future career experience could be a positive effect while being forced to work to meet financial needs could be negatively related to academic performance.

Lastly, the two measures used as a proxy for academic performance, cumulative GPA and the fall 2008 semester GPA, were obtained from official university records. This eliminates the potential errors from self reporting on perceived academic performance found in many studies. Cumulative GPA was included as an exploratory variable to control for the longitudinal nature of specific individual factors. According to Svanum and Bigatti (2006), a student's past cumulative GPA, representing his/her past academic performance, is significant in explaining his/her current academic

performance, given everything else is constant. Of course, the qualification of constancy of other factors is tentative at best, but hopefully, by controlling on past cumulative GPA, it was anticipated that more generalized conclusions could be reached explaining the remaining variability of academic performance. Total earned credit hours prior to the fall 2008 semester for each student were also sourced from the institutional research department of the university.

RESULTS

Data

A total of 459 completed surveys were collected. After eliminating surveys that were not valid for various reasons, 373 unique records of undergraduate business students comprised the final dataset. Further, after the addition of the previously mentioned data from institutional research, all individual student identifying information was eliminated from each record prior to statistical manipulation. Minor data cleaning and missing value handling were performed by deletion and imputation (Little, 1992).

Descriptive Statistics

The categorical variables are summarized with corresponding frequency percentages in Table 1. Inspection of the distribution of the categorical levels revealed that all of the demographic and academic information are reasonable representations of the entire student body from the College of Business Administration. For example, the distribution of majors in the dataset is close to the distribution of majors of all the students in the college of business.

With regard to employment information, 81% of students surveyed (303) were working during the fall 2008 semester. Most of them (92%) worked for financial reasons, while the nature of their job was generally irrelevant to their academic major (69%). 53% of working students believed their employment negatively impacted their academic performance.

Table 1: Categorical Variables

Demographic Information	***n***	***%***
Gender		
Female	173	46%
Male	200	54%
Race/Ethnicity		
White, Non-Hispanic	247	66%
Black, Non-Hispanic	39	10%
Hispanic	30	8%
Asian or Pacific Islander	14	4%
Indian or Alaskan Native	2	1%
Non-Resident Alien	38	10%
Blank	3	1%
Marital Status		
Single, never married	321	86%
Married	41	11%
Divorced	11	3%
Academic Information		
Academic Level		
Freshmen	19	5%
Junior	116	31%
Second Bachelor	4	1%
Sophomore	63	17%
Senior	171	46%
Major		
Accounting	66	18%
Economics	8	2%
Finance	50	13%
General Business	74	20%
Management	76	20%
MIS	24	6%
Marketing	75	20%
Employment Information		
Job Status		
On Campus	45	12%
Off Campus	254	68%
Both	4	1%
Not Employed	70	19%
Working Schedule		
8:00 am - 4: 00 pm	97	26%
4:00 pm - midnight	108	29%
Midnight - 8:00 am	6	2%
Other	92	25%
Not Employed	70	19%
Job's Relevance to Major		
No	208	56%
Yes	95	25%
Not Employed	70	19%
Reasons for Working		
Financial Needs	279	75%
Enhance Social Skills	3	1%
Internship Opportunity	2	1%
Gain Working Experience	15	4%
Other	4	1%
Not Employed	70	19%
Perceived Job Effect on Academic		
Positive	35	9%
Negative	161	43%
Neither	107	29%
Not Employed	70	19%
Grand Total *N*	**373**	**100%**

The descriptive characteristics of continuous variables are presented in Table 2. For all 303 working students, they generally worked for a single employer, worked an average of 29.83 hours per week, and commuted 1.82 hours, while concurrently taking 13.23 academic credit hours in the 2008 fall semester.

Table 2: Descriptive Statistics of Continuous Variables

	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
Age	373	18.00	54.00	23.34	5.68	3.19	11.66
GPA 2008Fall	373	0.00	4.00	2.69	0.86	-0.46	-0.13
Credit Hours 2008Fall	373	3.00	21.00	13.23	3.12	-0.87	1.38
Credit Hours in Major 2008Fall	373	0.00	21.00	8.08	4.91	-0.04	-1.00
GPA before 2008Fall	373	1.38	4.00	2.84	0.57	0.23	-0.81
Credit Hours before 2008Fall	373	0.00	177.00	85.41	32.32	-0.08	-0.26
Number of Employers	303	1.00	3.00	1.16	0.43	2.70	6.86
Hours of Working per Week	303	3.00	75.00	29.83	11.00	0.44	0.45
Hours of Commuting per Week	303	0.00	16.00	1.82	1.94	3.22	15.36

Preliminary Variable Analysis

Categorical Demographic and Academic Variables

The demographic and basic academic information represented by categorical variables is examined first. The group level means of academic performance (fall 2008 semester GPA) *GPA2008F* are compared based on *Gender*, *Ethnicity*, *MaritalStatus*, *AcademicLevel* and *Major*. Table 3 describes the group means and the significance of F-values using Welch's ANOVA test (Hayes, 2005, pp. 376). Post hoc tests in the form of the Tamhane test without equal variance assumption were also utilized to compare pairwise differences between group levels. Variables showing significant group level differences are:

- *Gender*: Male has a lower mean of *GPA2008F* (M = 2.56) than Female (M = 2.84), p = 0.002.
- *Ethnicity*: There are 7 group levels for this variable. The ANOVA test for this variable is significant with p = 0.001. Further, students belonging to the group of Non-Resident Alien have the highest mean of *GPA2008F* (M = 3.27). It is 0.568 higher than the White group (M = 2.70, p = 0.000), 1.077 higher than the Black group (M = 2.19, p = 0.000), 0.691 higher than the Hispanic group (M = 2.58, p = 0.015),

and 1.050 higher than the Blank group (M = 2.22, p = 0.032, n=3, these students did not provide this information). Also, students of the White group have a 0.051 higher mean (M = 2.70) of *GPA2008F* than the Black group (M = 2.19, p = 0.022).

- *MaritalStatus*: Although the ANOVA test for this variable is significant (p = 0.014), all the pairwise comparisons are not significant. Hence, it can only be concluded that the means of *GPA2008F* are different among Single Never Married, Married, and Divorced students.
- *Major*: There are 7 group levels for this variable. The ANOVA test for this variable is significant with p = 0.002. Further, students majoring in Economics have a higher mean of *GPA2008F* (M = 3.29) than MIS students (M = 2.27, p = 0.017), and a higher mean than General Business students (M = 2.44, p = 0.030).

Categorical Employment Variables

Categorical employment variables include *JobStatus*, *WorkingSchedule*, *RelevanceToMajor*, *ReasonsForWorking*, and *JobEffectOnAcademic*. Intuitively, these variables represent different working conditions (on-campus or off-campus job, day-time or night-time job, etc.), working motivations (why choose to work, whether job task is relevant to major, etc.), and perceived working effect on academic performance. Table 3 also describes the group means for academic performance (*GPA2008F*) for these variables and the significance of the associated F-values using Welch's ANOVA test. Variables showing significant group level differences are:

- *JobStatus*: The mean of *GPA2008F* is significantly different for all the group levels (p = 0.010). Further, students with an on-campus job have a higher mean of *GPA2008F* (M = 3.06) than those with an off-campus job (M = 2.58), p = 0.001.
- *WorkingSchedule*: The mean of *GPA2008F* is significantly different for all the group levels (p = 0.009). Further, students working primarily during the 8:00am – 4:00pm time period have a higher mean of *GPA2008F* (M = 2.90) than students working during the 4:00pm - Midnight time period (M = 2.56), p = 0.033, and a higher mean than students working other time periods (M = 2.48), p = 0.009. This result shows that students working during the 8:00am – 4:00pm time period

may be able to work around normal class hours and have time to study during off hours in the evenings.

- *JobEffectOnAcademic*: The mean of *GPA2008F* is significantly different for all the group levels (p = 0.000). For the pairwise comparisons, students with a perception of a negative working impact have a lower mean of *GPA2008F* (M = 2.46) than students with a perception of no working impact (M = 2.89), p = 0.000, and a lower mean than students Not Employed (M = 2.84), p = 0.017. This may demonstrate that students with a perception of a negative working impact are aware of a real problem in balancing work and study.

Table 3: One Way ANOVA Test for Categorical Variables on *GPA2008F*

GPA2008F	*Mean*	*Standard Deviation*	*Welch's ANOVA Sig F.*
Gender			0.002
Female	2.84	0.81	
Male	2.56	0.88	
Race/Ethnicity			0.001
White, Non-Hispanic	2.70	0.85	
Black, Non-Hispanic	2.19	0.85	
Hispanic	2.58	0.94	
Asian or Pacific Islander	2.64	0.91	
Indian or Alaskan Native	2.92	0.47	
Non-Resident Alien	3.27	0.48	
Blank	2.22	0.20	
Marital Status			0.014
Single, never married	2.64	0.85	
Married	2.92	0.88	
Divorced	3.19	0.65	
Academic Information			
Academic Level			0.332
Freshmen	2.46	0.99	
Junior	2.68	0.82	
Second Bachelor	3.00	1.02	
Sophomore	2.52	0.94	
Senior	2.78	0.83	
Major			0.002
Accounting	2.85	0.87	
Economics	3.29	0.51	
Finance	2.80	0.81	
General Business	2.44	0.96	
Management	2.81	0.74	
MIS	2.27	0.94	
Marketing	2.66	0.80	
Employment Information			
Job Status			0.010
On Campus	3.06	0.71	
Off Campus	2.58	0.86	
Both	2.68	0.68	
Not Employed	2.84	0.89	
Working Schedule			0.009
8:00 am - 4: 00 pm	2.90	0.81	
4:00 pm - midnight	2.56	0.82	
Midnight - 8:00 am	2.95	0.57	
Other	2.48	0.88	
Job's Relevance to Major			0.330
No	2.69	0.84	
Yes	2.58	0.86	
Reasons for Working			0.442
Financial Needs	2.67	0.85	
Enhance Social Skills	3.05	0.93	
Internship Opportunity	2.90	0.42	
Gain Working Experience	2.39	0.95	
Other	2.26	0.38	
Perceived Job Effect on Academic			0.000
Positive	2.83	0.97	
Negative	2.46	0.84	
Neither	2.89	0.75	
Total	**2.69**	**0.86**	

Correlation Analysis of Continuous Variables

Correlation analysis was performed for all continuous variables. Table 4 shows the correlations and the levels of significances.

Table 4: Pearson Correlations of Continuous Variables

	GPA2008F	Age	CreditHours2008F	CreditHoursPre2008F	GPAPre2008F	CreditHoursinMajor2008F	Nof Employers	HoursOfWorking	HoursOfCommuting
GPA2008F	1.00	-	-	-	-	-	-	-	-
Age	.180**	1.00	-	-	-	-	-	-	-
CreditHours2008F	0.07	-.411**	1.00	-	-	-	-	-	-
CreditHoursPre2008F	.137**	.338**	-0.08	1.00	-	-	-	-	-
GPAPre2008F	.686**	0.07	.137**	-0.02	1.00	-	-	-	-
CreditHoursinMajor2008F	-0.02	-0.09	.280**	.278**	-0.06	1.00	-	-	-
Nof Employers	-.135*	-0.05	0.00	0.11	0.00	0.04	1.00	-	-
HoursOfWorking	-0.11	.188**	-.441**	0.09	-.186**	-0.03	.184**	1.00	-
HoursOfCommuting	-.214**	0.08	-0.08	-0.08	-0.06	-0.03	.169**	.237**	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Examining the results in Table 4, reveals that both the number of credit hours accumulated prior to the fall 2008 semester (*CreditHoursPre2008F*) and *Age* are positively correlated with *GPA2008F*. Additionally, the number of employers of a student (*NofEmployers*) and *HoursOfCommuting* are negatively correlated with *GPA2008F*. Not surprisingly, a student's cumulative GPA prior to the fall 2008 semester (*GPAPre2008F*) has a very strong positive correlation with *GPA2008F* (0.686, $p<0.01$). This may be explained by academic consistency, as well as a student's individual academic capability.

Also from Table 4, one counterintuitive observation is the non-significant correlation between the number of hours worked per week (*HoursOfWorking*) and academic performance (*GPA2008F*). In other words, correlation analysis would seem to support previous research that found no significant relationship between the number of hours worked and academic performance as measured by GPA. This argument is investigated further using a more comprehensive regression analysis.

All the other significant correlations are no higher than 0.5. This indicates the probable lack of colinearity concerns when taking all continuous variables into the multiple regression models.

Multiple Linear Regression

With results from preliminary ANOVA and correlation analysis, formal regression analysis can be conducted. The dependent variable is the academic performance of students in the fall 2008 semester as represented by their semester GPA (*GPA2008F*). In order to better control for the basic demographic and academic information, the past academic performance, and current employment information, stepwise regression is utilized to test the corresponding information by adding independent variables into the model in batches and observing the changes in R-square (Hocking, 1976). The variables are grouped into the following batches:

- Batch 1: includes only the demographic and basic academic information (*Age*, *Gender*, *Ethnicity*, *MaritalStatus*, *AcademicLevel* and *Major*).
- Batch 2: consists of past academic performance and cumulative credit hours variables (*GPAPre2008F* and *CreditHoursPre2008F*).
- Batch 3: includes the general academic and employment information of the fall 2008 semester (*CreditHours2008F* and *CreditHOursInMajor2008F*, and *JobStatus*). In order to include all collected records, only the above variables are in this batch. Including any other employment related information will lead to the elimination of non-working students records.
- Batch 4: consists of all the remaining employment information variables of the fall 2008 semester (*NofEmployers*, *HoursOfWorking*, *HoursOfCommuting*, *WorkingSchedule*, *ReasonsForWorking*, *RelevanceToMajor*, and *JobEffectOnAcademic*). Note that these variables only apply to working students.

Stepwise regression models are developed by incorporating the above information step-by-step to check the effect of each batch of variables on current academic performance. Prior to generating the models, all categorical variables are coded into either dummy variables or interval variables (Velleman and Wilkinson, 1993) as indicated below:

- *Gender*: *Female* dummy;
- *Ethnicity*: dummies for each category except for N/A category;
- *MaritalStatus*: *Single* and *Married* dummies;

- *AcademicLevel*: converted to a numeric 1-5 scale representing Freshman, Sophomore, Junior, Senior and SecondBachelor.
- *Major*: dummies for each category except for *Economics*;
- *JobStatus*: numeric 0-3 scale representing not employed, on-campus, off-campus, and both;
- *WorkingSchedule*: numeric 0-3 scale representing other, 8:00am – 4:00pm, 4:00pm – Midnight, and Midnight – 8:00am;
- *RelevanceToMajor*: *Relevent* dummy;
- *ReasonsForWorking*: *FinancialNeed* dummy (because 92% of the working students chose this as the reason, the other 3 reasons are grouped as non *FinancialNeed*)
- *JobEffectOnAcademic*: *PositiveEffect* and *NegativeEffect* dummies.

Without Controlling for Past Academic Performance

For the first model, only the variables from Batch 3 are used; *CreditHours2008F, CreditHOursInMajor2008F* and *JobStatus*. *JobStatus* becomes a significant variable with a negative coefficient (-0.148, $p = 0.009$), which tends to indicate that academic performance (*GPA200F*) decreases in following the progression of no-job, on-campus job, off-campus job, and both types of jobs. However, the model (Model 1) has a very small adjusted R-square (0.016) which means it cannot explain the real variation of *GPA2008F*.

Therefore, for a more appropriate analysis, a stepwise regression model is then developed with the addition of the variables in Batch 1. By controlling for demographic and basic academic information, the impacts of students' academic loads (*CreditHours2008F, CreditHOursInMajor2008F*) and working status (*JobStatus*) on academic performance (*GPA2008F*) during the fall 2008 semester can be better evaluated. Table 5 shows the model summary.

Table 5: Model Summary for Using Variables in Batch 3 and Batch 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.155[a]	0.024	0.016	0.8511	0.024	3.026	3	369	0.03
2	.434[b]	0.189	0.142	0.79456	0.165	4.199	17	352	0

a. Predictors: (Constant), JobStatusNumeric, CreditHoursInMajor2008F, CreditHours2008F

b. Predictors: (Constant), JobStatusNumeric, CreditHoursInMajor2008F, CreditHours2008F, Female, FINC, Hispanic, IndianAlaskan, Asian, Black, MIS, GBUS, Married, AcademicLevelNumeric, MGMT, NonResidentAlien, ACCT, Age, Single, MKTG, White

The R-square change from Model 1 to Model 2 is significant which indicates that controlling for demographic and basic academic information helps to explain current academic performance. Significant variables in Model 2 include *Age*, *Female*, and *MIS*. The signs of the coefficients of these variables are consistent with our preliminary data analysis.

Of more interest to this study are those students who are working (*JobStatusNumeric* > 0). What are the impacts of working related variables on academic performance (*GPA2008F*)? This analysis is based on a subset of data because 70 non-working records have missing values for working related variables and are automatically deleted by the regression model(s). Batch 3 and Batch 4 are first combined in Model 3. Batch 1 information is then added to test the variables' effects on *GPA2008F*. Table 6 shows the model summary for working students.

Table 6: Model Summary for Working Students (Model 3 and 4)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
3	.368[a]	0.135	0.103	0.80372	0.135	4.138	11	291	0
4	.484[b]	0.234	0.156	0.77956	0.099	2.078	17	274	0.008

a. Predictors: (Constant), NegativeEffect, NofEmployers, CreditHours2008F, WorkingScheduleNumeric, FinancialNeed, HoursOfCommuting, CreditHoursInMajor2008F, Relevent, JobStatusNumeric, PositiveEffect, HoursOfWorking

b. Predictors: (Constant), NegativeEffect, NofEmployers, CreditHours2008F, WorkingScheduleNumeric, FinancialNeed, HoursOfCommuting, CreditHoursInMajor2008F, Relevent, JobStatusNumeric, PositiveEffect, HoursOfWorking, Hispanic, IndianAlaskan, FINC, MIS, Asian, Black, Female, MGMT, AcademicLevelNumeric, Married, GBUS, Age, ACCT, NonResidentAlien, Single, White, MKTG

Model 3, combining Batch 3 and 4 variables, has a small adjusted R-square (0.103). The following variables are significant: *NofEmployers*, *HoursOfCommuting*, and *NegativeEffect*. After adding the demographic information in Batch 1, the adjusted R-square increases significantly to 0.156 in Model 4, thereby producing the following significant variables: *CreditHours2008F*, *HoursOfCommuting*, and *NegativeEffect*. Note that *HoursOfWorking* is not a significant variable in explaining *GPA2008F*. However, *HoursOfCommuting* does appear to have a significant impact on academic performance. With each one additional hour spent on commuting per week, the student is expected to have a 0.082 lower *GPA2008F* ($p = 0.001$). It is also noted that students perceiving a negative impact on their academic performance from working tended to have a 0.377 lower *GPA2008F* than those students with a perception of working having no effect on *GPA2008F* ($p = 0.001$).

Overall, these models are vulnerable with relatively small adjusted R-squares. They do not have enough strength in predicting and explaining *GPA2008F*. Therefore, further development is indicated to find more relevant information to explain *GPA2008F*.

With Past Academic Performance

From the previously presented correlation analysis, it is known that past academic performance (*GPAPre2008F*) is significantly and positively correlated with fall 2008 academic performance (*GPA2008F*). *GPAPre2008F* might in fact be a very good proxy measure for a student's academic ability, as well as other individual characteristics including demographics, past working status,

etc. It is reasonable to believe that due to academic consistency, *GPAPre2008F* should be a strong predictor of *GPA2008F*. Therefore, of immediate concern is the question that after controlling for past academic performance, which employment related variable potentially has a significant impact on *GPA2008F*?

Models are first developed using all student records. A stepwise approach is again used by entering variables in the sequence of Batch 3 (fall 2008 semester academic and employment data), Batch 2 (past academic performance variables), and Batch 1 (demographic and basic academic data). These three regressions are denoted as Model 5, 6, and 7 respectively. Table 7 shows the model summary.

Table 7: Model Summary for Using Variables in Batch 3, Batch 2, and Batch 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
5	.155[a]	0.024	0.016	0.8511	0.024	3.026	3	369	0.03
6	.703[b]	0.494	0.487	0.6143	0.47	170.654	2	367	0
7	.739[c]	0.546	0.518	0.59592	0.052	2.352	17	350	0.002

a. Predictors: (Constant), JobStatusNumeric, CreditHoursInMajor2008F, CreditHours2008F

b. Predictors: (Constant), JobStatusNumeric, CreditHoursInMajor2008F, CreditHours2008F, GPAPre2008F, CreditHoursPre2008F

c. Predictors: (Constant), JobStatusNumeric, CreditHoursInMajor2008F, CreditHours2008F, GPAPre2008F, CreditHoursPre2008F, IndianAlaskan, Hispanic, MIS, Asian, FINC, Female, Black, MGMT, Married, GBUS, NonResidentAlien, ACCT, Age, Single, AcademicLevelNumeric, MKTG, White

As expected, the prediction power of *GPAPre2008F* seems very strong. The adjusted R-square increases from 0.016 to 0.487 after we add Batch 2 variables, which means that almost half of the variations in *GPA2008F* are now explained by Model 6. Further, adding demographic information increases the model fitness significantly as well because Model 7 has an adjusted R-square of 0.518.

The coefficient estimations for the variables of the above three models are listed in Table 8. In Model 5, *JobStatus* is a significant variable (p = 0.009). This was previously discussed in the section "Without Controlling for Past Academic Performance." Model 6 has

significant variables of *CreditHoursPre2008F* (p = 0.000) and *GPAPre2008F* (p = 0.000). After controlling for demographic information, Model 7 has significant variables of *GPAPre2008F* and *Age*. In other words, each unit increase in *Age* tends to have a 0.016 increase in *GPA2008F* (p = 0.041). Each unit increase in *GPAPre2008F* tends to have a 1.027 increase in *GPA2008F* (p = 0.000).

Table 8: Parameter Estimations for Model 5, 6, and 7

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Beta	Std. Error	Beta		
5	(Constant)	2.817	0.235		11.994	0
	CreditHours2008F	0.012	0.015	0.042	0.764	0.446
	CreditHoursInMajor2008F	-0.007	0.009	-0.041	-0.766	0.444
	JobStatusNumeric	-0.148	0.057	-0.139	-2.618	0.009
6	(Constant)	-0.498	0.253		-1.964	0.05
	CreditHours2008F	-0.004	0.011	-0.014	-0.349	0.728
	CreditHoursInMajor2008F	-0.004	0.007	-0.022	-0.536	0.592
	JobStatusNumeric	-0.021	0.041	-0.019	-0.499	0.618
	CreditHoursPre2008F	0.004	0.001	0.153	3.909	0
	GPAPre2008F	1.039	0.058	0.686	17.953	0
7	(Constant)	-1.009	0.602		-1.677	0.095
	CreditHours2008F	0.011	0.012	0.04	0.878	0.381
	CreditHoursInMajor2008F	-0.007	0.007	-0.041	-0.972	0.332
	JobStatusNumeric	0.008	0.043	0.007	0.182	0.856
	CreditHoursPre2008F	0.003	0.002	0.123	1.355	0.176
	GPAPre2008F	1.027	0.062	0.678	16.553	0
	Age	0.016	0.008	0.104	2.053	0.041
	Female	0.054	0.065	0.031	0.829	0.408
	White	0.148	0.353	0.082	0.419	0.676
	Black	-0.039	0.363	-0.014	-0.108	0.914
	Hispanic	-0.002	0.369	0	-0.006	0.995
	Asian	0.336	0.387	0.075	0.869	0.385
	IndianAlaskan	0.555	0.557	0.047	0.998	0.319
	NonResidentAlien	0.163	0.375	0.057	0.434	0.665
	ACCT	-0.197	0.232	-0.088	-0.85	0.396
	FINC	-0.151	0.235	-0.06	-0.643	0.521
	GBUS	-0.193	0.234	-0.09	-0.824	0.411
	MGMT	0.162	0.232	0.076	0.699	0.485
	MIS	-0.362	0.254	-0.104	-1.423	0.156
	MKTG	0.014	0.234	0.007	0.062	0.951
	Single	0.047	0.202	0.019	0.232	0.817
	Married	0.163	0.209	0.059	0.781	0.436
	AcademicLevelNumeric	-0.03	0.083	-0.032	-0.356	0.722
a. Dependent Variable: GPA2008F						

Model 7 is the best model with the highest adjusted R-square. Therefore, *JobStatus* has no significant impact on *GPA2008F* after controlling for both past academic performance and demographic information. This is basically the same result obtained and discussed in the first portion of the "Without Controlling for Past Academic Performance" section.

Models using the records of the working students are next developed using the subset of working students (n=303) in a similar stepwise method. The variables of Batch 3 are now combined with Batch 4 to include the current employment information of the working students group (Model 8), then Batch 2 is added (Model 9), and finally Batch 1 is incorporated (Model 10). Table 9 shows the model summary for analyzing the working students group.

Table 9: Model Summary for Working Students (Model 8, 9, and 10)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
8	.368[a]	0.135	0.103	0.80372	0.135	4.138	11	291	0
9	.734[b]	0.538	0.517	0.5894	0.403	126.052	2	289	0
10	.771[c]	0.595	0.55	0.56892	0.057	2.246	17	272	0.004

a. Predictors: (Constant), NegativeEffect, NofEmployers, CreditHours2008F, WorkingScheduleNumeric, FinancialNeed, HoursOfCommuting, CreditHoursInMajor2008F, Relevent, JobStatusNumeric, PositiveEffect, HoursOfWorking

b. Predictors: (Constant), NegativeEffect, NofEmployers, CreditHours2008F, WorkingScheduleNumeric, FinancialNeed, HoursOfCommuting, CreditHoursInMajor2008F, Relevent, JobStatusNumeric, PositiveEffect, HoursOfWorking, GPAPre2008F, CreditHoursPre2008F

c. Predictors: (Constant), NegativeEffect, NofEmployers, CreditHours2008F, WorkingScheduleNumeric, FinancialNeed, HoursOfCommuting, CreditHoursInMajor2008F, Relevent, JobStatusNumeric, PositiveEffect, HoursOfWorking, GPAPre2008F, CreditHoursPre2008F, IndianAlaskan, Hispanic, FINC, MIS, Asian, Black, Female, MGMT, Married, GBUS, Age, ACCT, NonResidentAlien, Single, AcademicLevelNumeric, White, MKTG

It is obvious that controlling for past academic information (Batch 2) leads to a much higher adjusted R-square of 0.517. Further, adding both the past academic information and the demographic information (Batch 1) can be easily justified by the significant changes of R-square. The coefficient estimations are examined next. Table 10 shows the parameter estimations.

Table 10: Parameter Estimations for Models for Model 8, 9, and 10

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
8	(Constant)	2.968	0.434		6.843	0
	CreditHours2008F	0.026	0.018	0.096	1.473	0.142
	CreditHoursInMajor2008F	-0.01	0.01	-0.055	-0.953	0.341
	JobStatusNumeric	-0.259	0.136	-0.116	-1.913	0.057
	NofEmployers	-0.227	0.114	-0.114	-1.992	0.047
	HoursOfWorking	0.007	0.005	0.085	1.24	0.216
	HoursOfCommuting	-0.074	0.025	-0.17	-2.97	0.003
	WorkingScheduleNumeric	0.045	0.056	0.046	0.808	0.42
	Relevent	0.012	0.108	0.007	0.116	0.908
	FinancialNeed	0.283	0.182	0.09	1.551	0.122
	PositiveEffect	0.005	0.16	0.002	0.029	0.977
	NegativeEffect	-0.385	0.108	-0.227	-3.554	0
9	(Constant)	-0.652	0.395		-1.649	0.1
	CreditHours2008F	0.012	0.013	0.042	0.869	0.386
	CreditHoursInMajor2008F	-0.002	0.008	-0.01	-0.23	0.818
	JobStatusNumeric	0.095	0.102	0.043	0.931	0.353
	NofEmployers	-0.298	0.084	-0.15	-3.542	0
	HoursOfWorking	0.007	0.004	0.086	1.71	0.088
	HoursOfCommuting	-0.063	0.019	-0.145	-3.424	0.001
	WorkingScheduleNumeric	0.032	0.041	0.032	0.77	0.442
	Relevent	0.013	0.08	0.007	0.16	0.873
	FinancialNeed	0.187	0.135	0.06	1.389	0.166
	PositiveEffect	-0.028	0.117	-0.011	-0.243	0.808
	NegativeEffect	-0.176	0.082	-0.104	-2.155	0.032
	CreditHoursPre2008F	0.004	0.001	0.149	3.368	0.001
	GPAPre2008F	0.992	0.064	0.671	15.459	0
10	(Constant)	-1.064	0.79		-1.347	0.179
	CreditHours2008F	0.029	0.014	0.107	2.02	0.044
	CreditHoursInMajor2008F	-0.006	0.008	-0.035	-0.766	0.445
	JobStatusNumeric	0.174	0.121	0.078	1.439	0.151
	NofEmployers	-0.313	0.086	-0.157	-3.655	0
	HoursOfWorking	0.004	0.004	0.052	1.035	0.301
	HoursOfCommuting	-0.072	0.019	-0.164	-3.856	0
	WorkingScheduleNumeric	0.027	0.042	0.027	0.63	0.529
	Relevent	-0.028	0.08	-0.015	-0.348	0.728
	FinancialNeed	0.175	0.134	0.056	1.308	0.192
	PositiveEffect	-0.004	0.115	-0.001	-0.034	0.973
	NegativeEffect	-0.18	0.083	-0.106	-2.183	0.03
	CreditHoursPre2008F	0.006	0.003	0.237	2.21	0.028
	GPAPre2008F	1.032	0.068	0.698	15.262	0
	Age	0.021	0.009	0.128	2.344	0.02
	Female	0.008	0.072	0.005	0.118	0.906
	White	0.218	0.342	0.121	0.637	0.525
	Black	0.157	0.353	0.059	0.445	0.656
	Hispanic	-0.015	0.36	-0.005	-0.042	0.967
	Asian	0.287	0.379	0.069	0.759	0.448
	IndianAlaskan	0.325	0.676	0.022	0.48	0.631
	NonResidentAlien	0.153	0.39	0.049	0.393	0.695
	ACCT	-0.241	0.427	-0.11	-0.563	0.574
	FINC	-0.168	0.431	-0.068	-0.389	0.697
	GBUS	-0.126	0.428	-0.06	-0.295	0.768
	MGMT	0.174	0.427	0.084	0.408	0.683
	MIS	-0.339	0.444	-0.099	-0.764	0.446
	MKTG	-0.028	0.429	-0.013	-0.065	0.948
	Single	-0.216	0.219	-0.088	-0.985	0.326
	Married	-0.119	0.235	-0.044	-0.504	0.615
	AcademicLevelNumeric	-0.154	0.096	-0.164	-1.611	0.108
a. Dependent Variable: GPA2008F						

Comparing Tables 6 and 9, Model 3 and Model 8 are identical with the same set of variables in Batch 4 and Batch 3. This model was discussed after the presentation of Table 6. All the significant variables, as well as the coefficients, are the same. Model 9 shows that after controlling for Batch 2 (past academic information), the following variables are significant: *NofEmployers*, *HoursOfCommuting*, *NegativeEffect*, *GPAPre2008F*, and *CreditHoursPre2008F*. *HoursOfWorking*'s coefficient has a *p* value of 0.088. However, 0.05 is used as the cut-off value for significance. Further, after controlling for both past academic performance and demographic information (Model 10), the following variables are significant: *CreditHours2008F*, *NofEmployers*, *HoursOfCommuting*, *NegativeEffect*, *CreditHoursPre2008F*, *GPAPre2008F*, and *Age*. Hence, *HoursOfWorking* is not significant in any model.

Model 10 in Table 9 of the working students group has the highest adjusted R-square. Each unit increase in *CreditHours2008F* tends to have a 0.029 higher *GPA2008F* (p = 0.044). Each unit increase in *NofEmployers* tends to have a 0.313 lower *GPA2008F* (p = 0.000). Each unit increase in *HoursOfCommuting* tends to have a 0.072 lower *GPA2008F* (p = 0.000). *NegativeEffect* has a coefficient of -0.180 (p = 0.030), which means that students having a perception of working negatively impacting their academic performance do have a 0.180 lower GPA than others (students with perceptions of positive impact or no impact). Each unit increase in *CreditHoursPre2008F* tends to have a 0.006 higher *GPA2008F* (p = 0.028). Each unit increase in *GPAPre2008F* tends to have a 1.032 higher *GPA2008F* (p = 0.000). Each unit increase in *Age* tends to have a 0.021 higher *GPA2008F* (p = 0.020).

CONCLUSION

One of the strongest observable outcomes of the research is that there is almost a direct relationship between students' cumulative GPAs prior to the fall 2008 semester and their GPAs for the fall 2008 semester. It is difficult, if not impossible, to interpret what this means. One possible explanation is that for many students the environment surrounding their undergraduate academic career remains relatively

static, at least in terms of the variables examined. Of course, gender and ethnicity are constant. Marital status was dominated by single students in our sample and once declared, majors may not change for the majority of students. This perhaps extends to their working circumstances as well. Students may work as much as necessary and some are capable of handling it better than others. Due to various financial aid and parents' health insurance requirements, a large number of students do not have the option to adjust their course load to less than 12 credit hours per long semester in order to improve their GPAs. They also may have little opportunity to modify their workloads. Therefore, perhaps once established, the pattern persists; some do well, others do not perform as well. Attempting a longitudinal study to examine cumulative GPA factors would be a daunting task.

Working obviously has some influence on the sample students' academic performances. Since variables other than the number of hours worked per week are significant, some thought is given as to the possible implications. One of the strongest negative associations with fall 2008 GPA is the number of employers. As would be expected, the number of employers is significantly positively correlated with the number of hours spent commuting to and from work, which is also significantly negatively associated with fall 2008 GPA. Hours of commuting is also positively correlated significantly with the number of hours worked per week. It may be able to be inferred that a student having multiple jobs will spend more time getting to and from those jobs, resulting in a negative influence on their academic performance, while at the same time possibly working more hours than a student with a single job. Multiple jobs could also complicate class scheduling and attendance. (Although not a part of the design of this study, the number of hours worked were combined with the time spent commuting to establish a definition of working used by Nonis and Hudson (2006). This combined variable of the number of hours devoted to work activities was also not significant in relation to students' academic performances, just as it was not in the study by Nonis and Hudson.)

The fact that a perceived negative impact on academic performance from working is a significant negative influence on fall 2008 GPA in two of the previous models and almost in the third (p = 0.055), is of interest as well. It could indicate that students are

knowledgeable and don't fool themselves with respect to the real effect their particular working circumstances have on their academic performances. This may be a potential source of valuable information that could be used to identify and help students struggling with working and academic achievement.

Age being the only significant demographic factor is consistent with the work of Cubeta et.al (2001) who found that students more successful than their peers tended to be older and reported past positive educational experiences. Their observation that "these findings suggest that high GPA may, in part, result from hard work and dedication on the part of students who are successful" could also provide some insight into this study finding that the best predictor of current academic performance is past performance regardless of their current working situation.

There is no overall support found for the general feelings of faculty that the academic performance of working students declines during their progression from lower level through upper level coursework. There is no insight gained with respect to any relationship between varying reasons why students work and academic performance, since almost all (92%) of working students in this study do so for financial reasons. Working students' majors also do not help explain their academic performances.

Finally, some additional observations related to working students are warranted. Cited studies suggested that probably over 50% of full-time university students in the United States work. In fact, 81% of the population sample of this study works! Not only do they work; of those making up the working group, 92% indicate they work primarily for financial reasons and 69% say their work is not relevant to their major. Perhaps even more indicative of the financial pressures increasingly driving them toward work is the average 29.8 hours per week worked and 1.8 hours per week spent commuting to and from work. This combines for a total average 31.6 hours per week consumed by work related activities while attempting an average 13.2 credit hours during the fall 2008 semester. From this, it is reasonable to conclude that full-time College of Business students at this public university are gradually becoming full-time workers as well.

FUTURE RESEARCH DIRECTIONS

Judging the effects of working on the academic performance of undergraduate college level students is not a simple task. The number of potential interrelated factors is huge. This research, while contributing to the existing body of literature on the subject, has not definitively clarified previous conflicting results. What is becoming apparent is a greater number of college students are by necessity working longer hours in order to pay for their education. Bradley's (2006) finding that 87% of Australian students sampled in his study of 2004 worked (an average of 15 hours per week) is indicative of this trend. This study's finding of 81% of the student sample working an average of about 30 hours per week is no less dramatic when compared to most of the recent literature citing a *probable* working rate of over 50% in the United States.

In Australia (Bradley, 2006), in the UK (Callender, 2008), and in the United States government financial support for public higher education continues to decline. Subsequently, costs for tuition and fees rapidly increase and the necessity to work extensively while attending college becomes ubiquitous. At the same time, the demand for quality college graduates continues to accelerate. These are obviously conflicting trends.

Recognizing that almost all students at public universities will be significantly employed, it would appear that attention should perhaps be directed toward a more open-ended research approach in which students who feel their academic performance is negatively affected by working are asked why. The insight gained from this approach could be used to develop a survey instrument to establish the relative importance of newly identified factors and perhaps help these students.

On the other hand, it may be more appropriate to just accept that working affects students differently in terms of their academic performance and attempt to examine whether or not the reduction in government financial support for public higher education in the United States and other countries (the underlying cause of increasing student employment?) is in fact a greater driver of overall academic performance and subsequent graduation rates.

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