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MEASURES OF STUDENT EFFORT AS  
PREDICTORS OF STUDENT'S GRADES

BY

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ABSTRACT

Astin (1984) has argued that college students' academic successes vary positively with the quality and quantity of their academic efforts. Despite this claim, empirical research has demonstrated that time spent studying--a prime example of student effort--is only a weak predictor of grades. It is argued in this article that this finding does not refute Astin's claim that effort and grades are related, because academic effort is more than just studying for exams; it is multidimensional. A cross-sectional, correlational research design was used in this study to test the relationship between academic success and the many dimensions of student effort. It was found that present semester grades vary positively with academic commitment, setting and honoring priorities, and time spent studying, but vary inversely with alcohol usage, partying, number of hours spent socializing with friends, absences due to boredom with classes, and absences due to the fatigue associated with excessive socializing and partying.

INTRODUCTION

In "Student Involvement: A Developmental Theory for Higher Education," Alexander W. Astin (1984: 301) argued that

...the extent to which [undergraduate college] students can achieve particular developmental goals [good grades] is a direct function of the time and effort they devote to activities designed to produce these gains.

This notion appears to be so basic and true that testing its veracity would seem like a waste of a researcher's own time and effort. But accepting

this notion at face value would be misleading, because some empirica' evidence attacks the veracity of this claim; for instance, the correlation between the amount of time college students spend studying--a prime example of student effort--and grades is very weak (Schuman et al. 1985). College students who spend the most time studying do always get the best grades, because student effort is more than just the amount of time college students spend studying for exams. It also entails attendance, amount of time reading textbooks, amount of material that is comprehended, academic commitment, and the best management and use of time (Astin 1984).

Students, professors, and college administrators would be more effective learners and educators if they understood the complexities of student effort. Because of their understanding of social organization and human behavior, sociologists are in an excellent position to assist them in these tasks. Up to this point, however, most researchers have ignored the multi-faceted impact of student effort on academic performance and have focused instead on only one or two dimensions of effort at a time. For instance, Wyatt's (1992) main concern was with absenteeism, while Britton and Tesser (1991) and Macon et al (1990) limited their analyses to time management activities. Michael and Mieth (1989) and Schuman et al (1985) focused on both absenteeism and study time, but they largely ignored other aspects of student effort. As a consequence of the narrowness of past studies, the impacts that student effort has on academic performance have been misunderstood and misapplied by college administrators, professors, and students.

The main goals of this research are to bring greater understanding to this issue by focusing on the multidimensional nature of student effort and investigating its relationship with college students' academic performances.

## REVIEW OF LITERATURE

The sociological study of student effort has emerged only during the previous decade. During this time, researchers have ascertained the empirical nature of student effort and its relationship with academic performance. As a result of these endeavors, it appears that student effort has three basic components: (1) absenteeism and the factors associated with attendance, (2) amount of time spent studying, and (3) the management and use of time. Interestingly, the amount of time spent working is not related in any statistically significant way with academic

success. The research in each of the three areas are reviewed below.

Wyatt (1992), Craig (1990), Michael and Miethe (1989), and Schuman et al. (1985) have found that absenteeism from classes is inversely related with grades. It also appears that student activities that lead to absenteeism--such as drug and alcohol usage (Wyatt 1992; Kowalewski, Holstein, and Schneider 1989; Galichon and Friedman 1985), excessive socializing and partying with friends (McCutcheon and Beder 1989), like or dislike of classes (Wyatt 1992), and boredom with academic life (McCutcheon and Beder 1989)--also spawn lower academic performances.

Although there has been little debate concerning the impact of absenteeism on grades, researchers have not agreed on the impact of time spent studying on academic performance. Schuman et al. (1985) claim that increased effort, when measured by time spent studying, does not generally improve grades; indeed, they found that there is only a weak relationship between these variables ( $r = .111$ ). Michael and Miethe (1989) disagree; they found that the relationship is much greater, but only under certain conditions. For instance, they (1989: 316) found that there is a significant relationship between effort and grades for students who study throughout the week ( $r = .230$ ), but not for students who "cram" for exams ( $r = .097$ ). And, that the relationship is stronger for freshmen and sophomores ( $r = .244$ ) than for juniors and seniors ( $r = .127$ ) and stronger for those who have no study routine ( $r = .230$ ) than for those who have a routine ( $r = .157$ ).

Closely related with the conditions that enhance or diminish the correlation between study time and grades is the notion of time management--cramming for exams and study routines are ways in which students manage their time. In fact, this evidence leads us to ask whether other aspects of time management are also correlated with grades. The literature supports the notion that time management is multidimensional and improves grades (Britton and Tesser 1991; Macon et al 1990).

"Multidimensional" means that students use different kinds of time management activities and that these different kinds of activities have varying degrees of impact on academic performance. Using factor analysis, Macon et al (1990) identified four dimensions of time management: (1) setting goals and priorities, (2) mechanics of time management such as planning, scheduling of appointments, and study time, (3) perceived control of time, and (4) preference for disorganization. They found that students who scored high on the first

three dimensions of time management also had higher GPAs and perceived themselves as having less ambiguity concerning their academic role as students. Preference for disorganization was related with role ambiguity but not with grades.

Britton and Tesser (1991) also looked at the relationship between grades and time management. Their factor analysis came up with three dimensions: short-term planning activities (e.g., making lists of things to do; setting daily goals; honoring priorities), long-term planning activities, and attitudes toward time management (e.g., feel in charge of own time; use time constructively). The first and last factors were found to be related positively with grades.

To sum up the literature on the relationship between student effort and grades, it must be stressed that student effort is more than just studying for exams. It also involves going to class and the adequate use of time. Nonstudent effort--excessive socializing with friends, partying, alcohol usage, and skipping classes--has a negative impact on academic success.

### THEORETICAL MODEL

Astin's model of student involvement (1984: 298) is used to integrate the empirical generalizations derived from the review of literature. Astin's model has five major components (in italics). The first three identify the multiple dimensions of student effort. The fourth component is a research proposition, while the fifth is a policy statement.

1. *Dimensions of student involvement include physical and psychological investment in academic and nonacademic activities.* These investments may be general (e.g., academic commitment; setting priorities; avoiding excessive socializing and partying) or specific (hours spent studying for a particular exam; honoring priorities; attending class sessions).

2. *There is a distribution of investment;* for instance, some students spend several hours studying, while others spend little time preparing for exams; some students miss several classes, while others have perfect attendance; some students manage their time effectively, while others have very little sense of time and its management. Indeed, investment falls along a continuum.

*3. There are both qualitative and quantitative dimensions of student investment.*

For instance, time spent studying is a quantitative measure of effort, while actually being able to comprehend the material that is being studied is a qualitative measure.

*4. Academic successes (grades) vary positively with both the quality and quantity of student effort.*

*5. Educational policies directed at improving academic performances must increase student involvement.*

In general terms, getting good grades requires not only studying but also academic commitment, going to class, and adequate use of time. In this study, hypothesis testing focuses on how grades vary with the quantitative aspects of both the general and the specific dimensions of

## METHODS

From a methodological standpoint, the main goal of this research is to test a version of Astin's model by, first, testing relevant hypotheses and, second, determining which factors explain the most variance in academic performance.

The null form of the following ten research hypotheses are tested:

- H<sub>1</sub>: Time students spend studying varies positively with their grades.
- H<sub>2</sub>: Academic commitment varies positively with student's grades.
- H<sub>3</sub>: The effort spent setting priorities varies positively with student's grades.
- H<sub>4</sub>: The effort spent honoring priorities varies positively with student's grades.
- H<sub>5</sub>: The amount of alcohol usage varies inversely with student's grades.
- H<sub>6</sub>: The amount of time spent socializing with friends varies inversely with student's grades.
- H<sub>7</sub>: The amount of time spent partying varies inversely with student's grades.
- H<sub>8</sub>: The number of excused absences varies inversely with student's grades.
- H<sub>9</sub>: The number of absences due to fatigue varies inversely with student's grades.
- H<sub>10</sub>: The number of absences due to boredom with classes varies inversely with student's grades.  
student effort.

## DESIGN AND SAMPLE

A survey questionnaire was designed and submitted to a purposive sample of students at a state university in the Great Plains region of the United States. An introductory psychology class of 356 students was selected because it was a representative sample of first-year students. Only the questionnaires completed by the first-year students were used when testing the research hypotheses. Seventy-one percent of the students were first-year students. This segment was chosen as the target population and isolated from sophomores, juniors, and seniors for one practical reason: school administrators are most concerned with the academic efforts and performances of first-year students (Upcraft and Gardner 1990: 1). The questionnaire, which was administered during the spring semester of 1993, assured students of their complete anonymity.<sup>1</sup>

## VARIABLES

**Grades.** Present semester's grade point average (PGPA) is the dependent variable in this study. Students were asked to indicate the classes that they were presently enrolled and the grades they expected to get in these classes. Present semester GPA was used instead of cumulative grade point average (CGPA), because PGPA comes in time after the independent variables have occurred, while some of the grades used to calculate CGPA come before the independent variables have occurred. Thus, CGPA cannot in any way be a dependent variable. Expected grades were calculated and used instead of actual grades because all students were assured that their responses were anonymous.

**Time spent studying.** The number of hours per week spent studying is the primary measure of academic effort used in this study. It was measured on a ten-point scale ranging from 0 hours to over 32 hours. This item was standardized by dividing the values by the number of credit hours taken during the present semester.

**Academic conunitment.** A fifteen point index was developed by adding

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<sup>1</sup>A copy of the questionnaire can be obtained by contacting the author at: Sociology Department, South Dakota State University, Box 504, Scobey Hall #204, Brookings SD 57007-1296.

the scores from three items: How important are "getting high grades," "being a good student," and "receive a good education." Each of these items were measured on a five point scale ranging from not important (=1) to most important (5). ACADEM is used in the tables to refer to this variable.

**Setting and honoring priorities.** Dimensions of time management are aspects of academic effort. Six questions were used to measure the use of time management activities. This was done by asking students about the extent to which they do the following:

- I make lists of the things I have to do each day.
- I plan my day before I start it.
- I spend part of each day planning.
- I have a clear idea of what I want to accomplish next week.
- I set and honor priorities.
- I determine which tasks are most important and do them first.

The first five of these items were taken from Britton and Tesser (1991). These items were measured on a five-point scale, with 1 = never and 5 = always. Factor analysis was employed to determine if these items were measuring similar dimensions of time management. Based on the factor analysis, the first four items were combined and labeled TMANG1, while the last two items were combined and labeled TMANG2. Although each of these items measured a dimension of short term planning activities, the items in TMANG1 deal with **setting priorities**, while those items that make up TMANG2 deal specifically with both **setting and honoring priorities**.

**Absenteeism.** Absenteeism is also a measure of academic effort, but it is an inverted measure; that is, the higher the absenteeism, the lower the academic effort. Students miss classes for many reasons and it seems logical that grades would not be affected equally by all forms of absenteeism. But what are the different forms of absenteeism? McCutcheon and Beder (1989), through factor analysis, have discovered six general kinds of absences: (1) absences due to negative perceptions of professor, (2) absences due to irresponsible pursuit of pleasure, such as missing class due to a hangover, (3) absences due to fatigue associated with excessive socializing, (4) absences due to low incentives for attendance, (5) absences due to the high probability of dropping out, and (6) absences due to external responsibilities, such as being sick or having a dental appointment.



Based on these dimensions, four measures of absenteeism were developed for this study. The first, SKIPS, included all absences regardless of whether or not the absences were "excused" or "unexcused." The second measure, EXCUSED, is an index developed by adding the number of absences due to: "personal problem (other than being ill or having a hangover)," "illness that you had," "illness in the family (or other family problem)," "weather (icy roads, snow storms, etc)," "had transportation problem," and "college excused absence (sporting activity, band, judging team, etc)." The third measure, BORING, included only those unexcused absences due to "didn't like teacher" and "didn't feel like going (or class was boring)." The final measure, FATIGUE, included only those unexcused absences that resulted from "overslept" and "hangover." These four indices were also standardized by dividing by credit hours.

**Nonacademic effort (alcohol usage; socializing with friends; partying).** Nonacademic effort includes those activities that have little, if anything, to do with academic effort and that use up time that could otherwise be spent on academic pursuits. Three measures are used in this study: alcohol usage, socializing with friends, and partying. The extent of alcohol usage was measured by combining the scores for the following two questions: "During a typical week, how many days do you drink alcoholic beverages?" "When you drink alcoholic beverages about how many drinks do you usually have?". The scores were combined after they were transformed to the same scale. As a final step, the standardized scores were divided by the number of credit hours taken during the present semester.

Socializing with friends and partying were measured by asking students to indicate the number of hours they spend doing those activities. A ten-point scale ranging from none to over 32 was developed. These items were standardized by dividing the values by the number of credit hours taken during the present semester.

## STATISTICS

Means and standard deviations are reported in Table 1 for each variable in the study. Associations were calculated using the Pearson's product-moment correlation procedure. Multiple regression and stepwise regression formulas were used to determine which factors explain the most variance in PGPA.

TABLE 1. MEANS AND STANDARD DEVIATIONS FOR SELECTED VARIABLES

VARIABLE	N	MEAN	STD DEV
--- academic performance ---			
Present Semester GPA	149	3.00	0.57
--- academic commitment and effort ---			
Hours Spent Studying	150	3.84	1.97
ACADEM	150	11.99	2.11
-- time management --			
TMANG1 (setting priorities)	150	11.85	3.59
TMANG2 (honoring priorities)	149	7.21	1.65
--- absenteeism*---			
SKIPS (all absences)	150	.94	.74
EXCUSED	147	.37	.39
FATIGUE	147	.15	.22
BORING	147	.30	.33
--- nonacademic effort ---			
# Hours Socializing w/Friends	150	4.30	2.38
# Hours Partying	150	1.57	1.30
Alcohol Usage	150	0.25	0.22

\*The absences per credit hour are reported.

## RESULTS

### HYPOTHESIS TESTING

An analysis of Pearson correlation coefficients supports the hypotheses that academic performance is related with academic commitment, time management, and academic and nonacademic effort

(see Table 2). Only one measure, the number of EXCUSED absences, was found to be significantly related with PGPA. Results of hypothesis testing are found below.

Ho<sub>1</sub>: Time students spend studying does not vary positively with their grades.

Although a weak positive relationship (+.178) was found, it was statistically significant. The null hypothesis is, therefore, rejected.

Ho<sub>2</sub>: Academic commitment does not vary positively with student's grades.

A weak, but statistically significant, positive relationship (+.227) was found. The null hypothesis is, therefore, rejected. . .

Ho<sub>3</sub>: The effort spent setting priorities does not vary positively with student's grades.

A weak, statistically significant, positive association (+.186) was found, This null hypothesis was also rejected.

Ho<sub>4</sub>: The effort spent honoring priorities does not vary positively with student's grades.

The correlation of +.359 for the association between honoring priorities and PGPA was the strongest one found in this study. Because it was also statistically significant, the null hypothesis was rejected.

Ho<sub>5</sub>: The amount of alcohol usage does not vary inversely with student's grades.

The association for alcohol usage and grades was -.222, which was statistically significant. Because the variables are indeed related in an inverse manner, the null hypothesis is rejected.

Ho<sub>6</sub>: The amount of time spent socializing with friends does not vary inversely with student's grades.

Table 2. PEARSON PRODUCT-MOMENT CORRELATIONS OF GRADES (PGPA) WITH THE INDEPENDENT VARIABLES

	1	2	3	4	5	6	7	8	9	10	11
(1) Present semester GPA											
(2) Time spent socializing	.159*										
(3) Hours spent partying	.231**	.371***									
(4) Alcohol usage	.222**	.272***	.743***								
(5) ACADEM	.227**	.071	.138	-.108							
(6) Hours spent studying	.178*	.098	.054	.016	.351***						
(7) TANGI	.186*	.019	.085	-.052	.341***	.343***					
(8) TMANWZ	.353***	-.026	-.185*	-.157	.298***	.258**	.439***				
(9) SCIPS	-.322***	.267***	.131	.140	-.173*	-.240**	-.299***	-.182*			
(10) EXCUSED	.134	.039	.054	.032	.081	-.023	.157	-.104	.725***		
(11) FATIGUE	-.324***	.241**	.236**	.310***	-.202*	-.240**	-.159	-.143	.691***	.182*	
(12) BORDR	-.187*	.371***	.067	.042	-.133	-.228**	-.295***	-.151	.686***	.209*	.287***

\*  $p \leq .05$  \*\*  $p \leq .01$  \*\*\*  $p \leq .001$

A weak, but statistically significant, negative relationship (-.199) was found. The null hypothesis is, therefore, rejected.

Ho<sub>7</sub>: The amount of time spent partying does not vary inversely with student's grades.

A weak, but statistically significant, negative relationship (-.231) was also found when time spent partying was correlated with grades. The null hypothesis is, therefore, rejected.

Ho<sub>8</sub>: The number of excused absences does not vary inversely with student's grades.

This null hypothesis was the only one to be rejected. The correlation of -.134 was not statistically significant.

Ho<sub>9</sub>: The number of absences due to fatigue does not vary inversely with student's grades.

The correlation of -.324 for the association between absences due to fatigue and PGPA was the second strongest one found in this study. Because it was statistically significant, the null hypothesis was rejected.

Ho<sub>10</sub>: The number of absences due to boredom with classes does not vary inversely with student's grades.

A weak, but statistically significant, negative relationship (-.197) was also found when time spent partying was correlated with grades. The null hypothesis is, therefore, rejected.

In sum, grades (PGPA) are related moderately and significantly with honoring priorities (+.359), unexcused absences due to fatigue (-.324), total absences (-.292), number of hours per week spent partying (-.231), and academic commitment (+.227). The analysis found weak but statistically significant relationships between PGPA and most of the other measures: extent of alcohol usage (-.222), number of hours per week spent socializing with friends (-.199), absences due to disinterest with classes (-.197), setting priorities (+.186), and number of hours spent studying per week (+.178). Although none of these correlations are strong, the research hypotheses have been accepted.

TABLE 3. MULTIPLE REGRESSION ANALYSIS OF PGPA WITH MEASURES OF ACADEMIC EFFORT (unstandardized regression coefficients are on the first line; standardized regression coefficients are on the second line)

INDEPENDENT VARIABLES	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Intercept	2.809***	2.276***	1.904***	2.147***	2.237***
Time Spent Studying	0.711 (0.178)	0.448 (0.112)	0.238 (0.059)	0.030 (0.007)	0.177 (0.044)
ACADEM		0.050* (0.188)	0.031 (0.166)	0.022 (0.085)	0.018 (0.068)
TMANG1			-0.001 (-0.008)	-0.005 (-0.030)	-0.002 (-0.014)
TMANG2			0.107*** (0.313)	0.108*** (0.307)	0.103*** (0.294)
EXCUSED				-0.056 (-0.038)	-0.070 (-0.048)
FATIGUE				-0.595** (-0.238)	-0.478** (-0.191)
BORING				-0.125 (-0.072)	-0.052 (-0.030)
Time socializing with friends					-0.363 (-0.113)
Alcohol usage					-0.347 (-0.076)
R <sup>2</sup>	.0300	.0625	.1477	.2250	.2432
ADJ R <sup>2</sup>	.0250	.0496	.1239	.1857	.1931

\*p ≤ .05 \*\*p ≤ .01 \*\*\*p ≤ .001

### MULTIPLE REGRESSION ANALYSIS

Even though correlation analysis has supported nearly all of the research hypotheses, this kind of analysis has its weaknesses. For instance, Pearson's correlation analysis does not account for the multicollinearity among the independent variables. Multiple regression analysis controls for multicollinearity and it is used to further our

analysis of academic effort's impact on academic performance.

An examination of the multiple regression analysis shows the R2 and Adjusted R2 improve with the addition of predictor/independent variables (see Table 3). Time spent studying (Model 1), although significant, explains only 3% of the variation in PGPA. With the addition of academic commitment (Model 2), R2 increases to .0625. With the addition of the time management variables (Model 3), R increases to .1477--a sizable jump; the improvement of Model 3 over Model 2 comes with the addition of TMANG2 (honoring priorities) The addition of measures of absenteeism (Model 4) again improves R2- now up to .2250. The improvement comes with the addition of FATIGUE (absences due to oversleeping and hangovers). Model 5 also increases the amount of variance in PGPA that can be explained (R2 up to .2432); however, this increase is not statistically greater than Model 4.

TABLE 4. STEPWISE MULTIPLE REGRESSION OF ANALYSIS:  
PGPA WITH SELECTED PREDICTOR VARIABLES

INDEPENDENT VARIABLES	PARTIAL R <sup>2</sup>	MODEL R <sup>2</sup>	F	PROB > F
TMANG2 (honoring priorities)	0.1371	0.1371	22.8827	0.0001
FATIGUE	0.0753	0.2124	13.6850	0.0003
Time spent socializing w/friends	0.0171	0.2295	3.1555	0.0778

### STEPWISE REGRESSION ANALYSIS

Stepwise regression analysis is a more parsimonious account of the variance in the criterion/dependent variable accounted for by the predictor/independent variables than is the linear regression analysis used above. The findings from this analysis are found in Table 4. An examination of these findings reveal that TMANG2 (honoring priorities) is the predictor variable that explains the most variance in PGPA (partial R<sup>2</sup> .1371). FATIGUE (absences due to oversleeping

and hangovers) is the predictor variable that explains the most of the remaining (residual) variance in PGPA (partial  $R^2 = .0753$ ). Time spent socializing with friends explains the second most amount of the residual variance (partial  $R^2 = .0171$ ). The variance explained by each of the remaining variables is not statistically significant. Just less than twenty-three percent (Model  $R^2 = .2295$ ) of variance in PGPA is accounted for by these three variables.

## DISCUSSION

The results of hypothesis testing gives credence to Astin's theory of student involvement. Academic successes do indeed vary positively with students' involvement in their academic activities--all variables except the number of excused absences were related significantly with grades. Even so, some dimensions of effort are more meaningful than others. For instance, time spent studying and setting priorities are weak predictors of students' grades, while honoring priorities and skipping classes due to fatigue are stronger predictors.

If these results are indeed valid, students who want to improve their GPAs would benefit by honoring the priorities that they set for themselves. They would also benefit largely by cutting down on their absences due to fatigue. If the Pearson correlation coefficient between Alcohol usage and FATIGUE is any indicator, many students can accomplish this by reducing the amount of alcohol they consume during any given week.

Even though the research hypotheses were accepted, it certainly appears that more research is needed. The correlations between PGPA and student effort are moderate at best and the best regression model explains only 24.32 percent of the variance in grades. It is expected that the model  $R^2$  would improve if Astin's model of student involvement was expanded to include other relevant variables. It must be remembered that Astin's model includes only variables that have to do with student effort. It is expected that grades, or the relationship between student effort and grades, would also vary by ability (intelligence), gender, race, social class, and other traditional sociological variables. Indeed, a replication of this study with these controls might produce more meaningful results. More meaningful results might also be produced if a more objective measure of grades had been used. Actual grades could not be used in this study because students were assured of their anonymity. Future studies should find



a way to overcome this methodological constraint. The veracity of Astin's theory also must be tested with a more diverse sample of students--most of the students in the sample were white females from working class and lower middle-class backgrounds. Finally, replications should attempt to make the model more predictive of students grades; this will give strength to its validity.

What of the policy implications of the study? It can be easily argued that administrators will be able to assist students in their quests for better grades by sponsoring time management seminars. This certainly seems reasonable, but the relationship between grades and attendance in a time management seminar needs to be investigated scientifically before it can be accepted outright.

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