

Locus of Control, Student Motivation, and Achievement in Principles of Microeconomics

Ahmad A. Kader, PhD
Department of Economics
University of Nevada, Las Vegas
4505 Maryland Parkway
Las Vegas, NV

Abstract

In the principles of microeconomics class that I taught during the summer of 2013, 44 out of 48 students participated in the completion of 5 questionnaires and a survey describing student characteristics. The questionnaires include: a 29-item Locus of Control Scale, a 12-item Achievement Goal Scale, a 19-item Test Anxiety Scale, a 16-item Procrastination Scale, and a 5-item Fear of Failure Scale. Using locus of control, the class was divided into two equal-sized groups of 22 students by a median split of 8.5. Those who scored 8 and below were treated as internals and those who scored 9 and above were treated as externals. The results of this study show that internals achieved better academically, suffered less from debilitating test anxiety, scored higher on a mastery approach, spent more hours working, and tended more to be of white ethnicity than externals. The regression results show that the locus of control variable has a negative and significant effect on the exam average.

Keywords: economic education, locus of control, student motivation

Economic educators have long been interested in the links between student achievement, as reflected by their exam average or grade, and its determinants, such as GPA, math ability, college entrance examination scores, and gender, which have been shown to have a strong influence on student performance (Anderson, et al. 1994). Other determinants that have been examined in economic education, include attendance, student standing, and study time, to mention a few. More recently, student personality type was added to the research effort to describe the relationship between student personality type as measured by Myers-Briggs Type Indicators and student success in principles of economic courses (Borg and Stranahan, 2002). However, personality attributes other than those measured by the Myers-Briggs Type Indicators have been largely ignored by economists. This includes personality traits associated with psychological theories involving the motivation to learn. To be sure, there are several of these theories, but many of them revolve around two basic premises: 1) the commitment to achieving a goal, i.e., student learning, and 2) the effort committed to its accomplishment, i.e., learning outcomes (Archer, 1994, Perrot et al., 2001). This study focuses on the achievement goal theory and locus of control to explore their effects on student motivation and learning outcomes in principles of microeconomics. As far as I know, only two research articles have appeared recently in economic education literature dealing with locus of control or the achievement goal theory. The focus of one article was on achievement goals, and the locus of control was introduced briefly as a moderator of its influence on the achievement goals variables (Hadsell, 2010). The other article dealt with locus of control and student evaluation of teaching (Grimes et al., 2004). The purpose of this study is to add to the literature in economic education by incorporating the two prominent theories in educational psychology and providing a framework of inquiry in an area that has been long being neglected in economic education.

Review of the Literature

Over the past thirty years, achievement goal theory has emerged as one of the “most prominent theories of achievement motivation” (Meece et al., 2006, 487). The source of motivation has been explained as a social-cognitive process (Anderman and Wolters, 2006). Students engage in a given task either to learn or to perform (Dweck and Elliot, 1983). These two contrasting forms of motivation have been labeled as either mastery-oriented or performance-oriented.

Students with a mastery orientation focus on developing their skills through learning and understanding, while those with a performance orientation focus on demonstrating their ability relative to others by creating an aura of competence (Avi Kaplan and Martin Maehr, 2007). Much of the research indicates that students who pursue a mastery goal approach achieve the most positive learning outcome, including persistence at difficult tasks (Jennifer Archer, 1994) and use learning strategies that enhance their understanding of the material. Research results show that performance goals are associated with surface level learning strategies such as memorizing concepts without putting in the effort to conceptually understand the material (Meece et al., 2006). However, there is evidence to suggest that students perform multiple goals in classroom situations, including mastery and performance goals, with positive learning outcomes, and that these two tasks are considered to be complementary rather than substitutes (Harackiewicz et al, 1998).

The mastery orientation is broken down into a mastery approach goal and a mastery avoidance goal. Students with the mastery approach goal want to learn the material, understand it, and be challenged, and their success is evaluated in terms of their self improvement, as well as by the satisfaction realized from learning the material. Those with a mastery avoidance goal want to avoid misunderstanding the material or not forgetting what they have learned (Pintrich, 2000). Students with the performance approach goal focus on attaining a favorable demonstration of competence through surface learning and not wanting to be challenged, and their success is evaluated by outperforming others rather than learning the material. Students with a performance avoidance goal focus on avoiding an unfavorable demonstration of ability, as reflected by underperforming others (Elliot and Church, 1997; Harackiewicz et al., 1998; Smith, 2006).

Achievement motivation is influenced by the extent to which individuals attribute their success or failure in response to events that are either under or beyond their control. This is referred to as locus of control. This social-cognitive theory was developed by Julian Rotter in 1954, but his work was not published until 1966 (Rotter, 1966). His theory is basically a social learning theory integrated with personality theory. Since then, the theory has generated a great deal of research in a variety of areas, including educational psychology, and it has become one of the most important constructs in the field of personality theory (Leone and Burns, 2000). The theory is conceptualized on an internal-external dimension. Individuals with an internal locus of control believe that events in their lives result primarily from their own actions, while individuals with an external locus of control believe that events in their lives are the result of someone else's action or are due to luck, fate, or chance. Internally oriented students believe in the connection between their behavior and its outcomes and as such they strive to have more control over their academic experience than externally oriented students. Thus, internally oriented and externally oriented students tend to follow different strategies to acquire learning (Grimes et al., 2004).

A study by Cassidy and Eachus (2000) showed that an internal locus of control is positively correlated with strategic learning (mastery approach) and negatively correlated with surface learning (performance approach). Another study by Siefert and O'Keefe (2001) found that high school students who were mastery oriented also exhibited internal orientation and that external orientation was negatively associated with a mastery goal. Another study by Perrot et al. (2001), using factor analysis for the goal orientation, locus of control, and learning strategies found that the majority of students in first year medical, nursing, and pharmacy at the University of Arkansas, used a mastery approach and that most of the students in the three programs reported an internal locus of control orientation. A study shows that an internal locus of control is associated with productive study habits among college freshmen, which provided a significant and positive effect on academic performance as reflected by their grades (Zhang and RiCharde, 1999). Also, research in educational psychology shows that internally oriented students tend to perform better academically than externally oriented students, as reflected by their GPA scores (Carden et al., 2004; Shepherd, et al., 2006).

As a personality variable, locus of control also is associated with procrastination, which is defined as the act of delaying a task that was originally planned despite expecting to be worse off for the delay (van Eerde, 2003). Academic procrastination has been linked to adverse behaviors and traits, such as poor study habits, missed deadlines, poor semester grades, and low self-esteem, to name a few (Solomon, 1984; Lee, 2005). Because internals perceive a contingent relationship between their behavior and its consequences, they tend to procrastinate less than externals. However, research on the relationship between academic procrastination and locus of control has shown mixed results. Some researchers found no relationship between the two variables (Ferrari, 1992; Baker and Ware, 1992), while others found that internals procrastinate less than externals (Choi, 1998; Janssen and Carton, 1999; Carden et al., 2004).

Test anxiety is another variable that is linked to locus of control. Alpert and Haber (1960) identified test anxiety related to academic tasks as having either debilitating or facilitating effects on performance. Debilitating or inhibiting anxiety is associated with decreased problem solving, coping skills, and academic exam scores, while facilitating or enhancing test anxiety tends to improve student performance in exam settings. Debilitating test anxiety has been found to be significantly and negatively related to examination performance (Defenbacher, 1977). On the other hand, facilitating test anxiety has shown to have the same effect on test situations as to those with no test anxiety (Halroyd et al., 1978).

Because internals have more control of their environment, they tend to handle stress differently than externals. Internals tend to be more adaptive to stress and attempt to reduce it through problem solving strategies, while externals respond to stress emotionally and hence may withdraw from the stressful situation. Research in educational psychology shows that internally oriented students suffer less from debilitating test anxiety than externally oriented students (Choi, 1998; Carden, et al., 2004).

Locus of control is also associated with a fear of failure. Since internals perceive having more control over their environment, they tend to be less worried and afraid about the expected outcome related to a given task than externals. However, a study found no significant association between locus of control and fear of failure (Burnett, 1981).

This study measures mastery and performance goals, debilitating and facilitating test anxiety, procrastination, fear of failure, and academic performance among internally and externally oriented students in principles of microeconomics. Student characteristics that might affect student behavior, including GPA, age, student classification (freshman, sophomore, junior, senior, other), gender, race, employment status, attendance, and study time were also measured and tested in terms of student orientation as internals or externals. The present study differentiates itself from others by testing the behavior of internally and externally oriented students in an economics course, which is done for the first time. The separation of the locus variable into internal and external orientation is designed to quantify student attributes and personality traits based on the achievement goal theory and its interaction with the locus of control orientation. The study is intended to show how this separation might affect student behavior, particularly in the areas of procrastination, test anxiety, and fear of failure. Secondly, the present study adds to the research literature by incorporating the achievement goal variables (mastery approach, mastery avoidance, performance approach, and performance avoidance), locus of control, as well other behavioral variables (debilitating test anxiety, facilitating test anxiety, procrastination, and fear of failure) to test for student performance as measured by average score. Thirdly, the study examines the association between demographic and educational student characteristics and their behavior as internally or externally oriented with characteristics variables such as attendance, study time, employment, ethnicity, gender, and age.

Data and Methods

During Summer Session III of 2013, I taught a principles of microeconomics class consisting initially of 49 students. Three exams of equal weight were given during the session. A survey questionnaire covering student characteristics including GPA, student classification, employment status (employed, number of hours employed weekly, or unemployed), gender, age, and race (white vs. nonwhite) was given at the end of the session. The mean of these characteristics and their standard deviation, including the average score of the three exams and actual attendance are shown in Table 1. Also, the questionnaire included five surveys that have become popular and are being tested in educational psychology research. This includes a 29-item Internal-External Locus of Control questionnaire with answers of "a" or "b" for each item. One point is awarded for certain answers and zero for the rest on 23 of the items. The other 6 items are filler. The other four surveys have a scale from 1 to 5 for each item. This includes a 35-item procrastination survey, and from those items 16 are recommended by the author for testing procrastination due to the demonstrated reliability of these items, but because the 35 items are also used in other research work, both the 35 and the 16 items will be examined here (Tuckman, 1991). A 19-item Achievement Anxiety Test survey with 10 items describing debilitating test anxiety and 9 items describing facilitating test anxiety also was included (Alpert and Haber, 1960). However, the scale for each item is reversed from the original paper so that a higher scale indicates a greater level of anxiety. A 5-item Fear of Failure survey (Conroy, 2001), and a 12-item survey with 3 each describing mastery approach, mastery avoidance, performance approach, and performance avoidance also were included (Elliot and Murayama, 2008).

The surveys were voluntary and confidential, but not anonymous. Students were given extra credit points for their participation, but these points were not included in the test results. Of the 48 students who remained enrolled in the class, 44 participated in the survey, which represents a 92% participation rate. Also, the survey data were supplemented with students' attendance records, which were maintained by the instructor periodically, and grades.

Empirical Models and Estimated Results

1. The null hypothesis to be tested is that internally and externally oriented students do not differ from each other with respect to their academic achievement, as reflected by their average exam score in the course and their cumulative GPA vs. the alternative that they do.
2. The null hypothesis to be tested is that internally and externally oriented students in the introductory microeconomics class do not differ from each other in their behavior with respect to the following variables: procrastination, debilitating anxiety, facilitating anxiety, mastery approach, mastery avoidance, performance approach, performance avoidance, and fear of failure vs. the alternative hypothesis that they do.
3. The null hypothesis to be tested is that internally and externally oriented students do not differ from each other with respect to their student characteristics vs. the alternative hypothesis that they do.

A one tailed t-test was used to confirm or reject the three aforementioned hypotheses. Also, for the whole sample of 44, the Pearson-Moment correlation coefficient was used to test for the degree of association between locus of control and the other variables to provide further evidence of rejecting or accepting the hypotheses above. Finally, several OLS regressions were run for the whole sample to test for the determinants of student achievement as reflected by the average score

For the whole sample, The Rotter scale score ranged from 1 to 18 with a mean of 8.773. Internal and external orientation of locus of control was determined by a median split of 8.5 and the sample was divided equally. Those (n=22) with a score of 8 and below were considered internally oriented and those (n=22) with a score of 9 and above were considered externally oriented. The average score for internals is 5.091 while for the externals it is 12.476 with a standard deviation of 2.467 and 2.754 respectively (Table 1). I must maintain that there are no hard rules for determining which group is externally oriented and which is internally oriented since this varies from one sample to another. For example, in the study by Carden et al. (2006, 581) the sample was divided by a median split of 10.5. The point here is that those who are externally oriented score above the median and those who are internally oriented score below it.

Table 1 reports the data for internally and externally oriented students including the locus of control scale, achievement goal measures, as well as data pertaining to student characteristics. Of all of the variables that have being tested on the basis of locus orientation, seven showed significant differences between internals and externals, as shown in Table 2. Of those seven, five are from demographic and educational characteristic variables including average score, age, employment, gender, and race. With respect to the average score and using a one tailed t test, the results show that internals achieve a significantly better average score than externals and with t value of 2.049, which is significant at the 5 percent level. This supports prior findings that internals achieve better academically than externals, although most of the results of prior research was based on self-reported GPA rather than on the average score (Carden, et al., 2004; Shepherd, et al., 2006). The significant difference in average score result found in this study was further supported by the negative and significant association between locus of control and average score obtained for the whole sample, as shown in Table 3, with an r value of -0.362 and a p value of 0.008. Note that the negative value of r shows that externals are underperforming internals in their average score. This study failed to find a significant difference between internals and externals in terms of their GPA measure. The t value was only 0.452 and was insignificant. With respect to age, the t value was 1.556, which is significant at the 10 percent level and shows that older students tend to be more externally oriented than younger ones, which is contrary to expectation. Even though the t value for the age group was significant, the r is small (0.099) and is insignificant when the whole sample is tested by comparing locus of control and age.

The third variable is employment, with a t value of 1.535, which is significant at the 10 percent type one error level. The results indicate that internals tend to work significantly more hours than externals. The results are also confirmed by the r value of -0.210 for the whole sample and with a p value of 0.086, which is significant at 10 percent. The fourth variable is gender, with a t value of 1.555, which is significant at the 10 percent level.

However, for the whole sample, the correlation value drops to -0.05 and with a p value of 0.371, which is insignificant. So, the overall results are inconclusive with respect to gender. The fifth variable describing student characteristics is race with a t value of 1.837, which is significant at the 5 percent level. The results also are supported by an r value of -0.265 and a p value of 0.041. Thus, the results show that whites tend more to be internals than non-whites. The last two significant variables pertain to achievement goal theory, as well as other behavioral variables from educational psychology. Table 2 results show that externals suffer significantly higher debilitating test anxiety than internals do, with the t test of -1.383, which is significant at the 10 percent level. This also is supported by the correlation coefficient obtained in Table 3, which shows an r value of 0.216 and a p value of 0.046. The results are consistent with the findings in a number of studies (Choi, 1998; Janssen and Cooper, 1999; Carden et al., 2004).

Mastery approach is another variable that is significantly different between internals and externals, with a t value of 1.479, which is significant at the 10 percent level. The result for the whole sample shows that the locus of control variable is negatively correlated with the mastery approach, which is as expected, with an r value of -0.228 and a p value of 0.068. Again, for the mastery approach and for the whole sample, externally oriented students are underperforming internals. The results show that internally oriented students are associated more with the mastery approach than externals are. This supports the findings of Cassidy and Eachus (2000), Siefert and O'Keefe (2001), and Perrot et al. (2001) mentioned earlier.

The t-test failed to find a significant difference between internals and externals with respect to procrastination for both the 35 survey items and the 16 items recommended by Tuckman. Their t values are 0.73 and 0.326, respectively. This is inconsistent with the results obtained by Carden et al. (2004, 582) who showed that externals tend to procrastinate more than internals with the 35 survey items and with a t value of -2.16 and a p value of 0.02. However, for the whole sample and with 16 survey items, the results of Table 3 show that locus of control is significantly and positively associated with procrastination, with an r of 0.22 and a p of 0.076. But, the r value drops to 0.121 and becomes insignificant with a p value of 0.217 if the 35 survey items are used instead. The results are obviously not conclusive enough to indicate that externals tend to procrastinate more than internals. This is consistent with some of the research findings in educational psychology (Ferrari et al., 1992) with the realization that these studies use only correlations to test for the relationship between locus of control and procrastination.

From the results obtained in Table 2 and Table 3, average score, employment, race, debilitating test anxiety, and mastery approach seem to be the only five variables that have robust results when comparing the t-test and r values. Therefore, it seems reasonable to reject the hypotheses that internals and externals do not differ from each other with respect to the above five variables in favor of the alternative hypothesis that they do differ.

Finally, this study examines the effect of locus of control along with other explanatory variables on student achievement, as reflected by the average score. Several OLS regressions were run with the following regression equation:

$$F = \alpha_1 + \alpha_2 G + \alpha_3 A + \alpha_4 Gn + \alpha_5 R + \alpha_6 S + \alpha_7 E + \alpha_8 At + \alpha_9 Lc + \alpha_{10} P + \alpha_{11} M + \alpha_{12} Mav + \alpha_{13} Pr + \alpha_{14} Prav + \alpha_{15} T + \alpha_{16} Ft + \alpha_{17} Ff + \varepsilon$$

Where:

F = Average score of the three exams is used as the dependent variable and it represents the best measure of student learning in the course

G = Student self reported GPA at the time of the survey

A = Age of student at the time of the survey

Gn = Gender (0 = female, 1 = male)

R = Race (0 = nonwhite, 1 = white)

S = Standing Classification (1 = freshman, 2 = sophomore, 3 = junior, 4 = senior, and 5 = other)

E = Employment Status (0 = unemployed, 1 = less than 5 hrs. per week, 2 = 5-15, 3 = 15-25, 4 = 25-35, 5 = above 35)

St = Study Time per week, 1 = 0-2 hrs 2 = 2-4 3 = 4-6, and 4 = >6

At = Attendance (1 = low level, 5 = high level)

Lc = Locus of Control (average score per student)

P = Procrastination (average score per student)

M = Mastery (average score per student)

M_{av} = Mastery avoidance (average score per student)
 P_r = Performance (average score per student)
 P_{rav} = Performance avoidance (average score per student)
 T = Debilitating test anxiety (average score per student)
 F_t = Facilitating test anxiety (average score per student)
 F_f = Fear of failure (average score per student)
 α = Coefficient to be estimated
 ϵ = Error term

The regression results are shown in Table 4. Model I shows the influence of student demographic characteristics such as age, gender, race, and employment, plus educational characteristics data, that may influence students' performance including GPA, attendance, standing, and study time. GPA is the only significant variable in this model with a t value of 2.25, which is significant at the 5 percent level and is consistent with other studies in economic education (Agarwal and Day, 1998; Savage, 2009). However, the overall results are insignificant, as is shown by the small values of R^2 (0.22) and F (1.234). Model II, which includes the influence of locus of control plus the achievement goal variables, provides much better results than in Model I, as shown by the significant value of F (2.974) and by the higher R^2 value (0.44). Still, only two variables are significant in this model, namely locus of control and debilitating test anxiety. However, both variables are significant and carry the correct negative sign with the locus of control with a t value of -2.227, which is significant at the 5 percent level and debilitating test anxiety with a t value of -3.083 and is significant at the 1 percent level. Note that the negative regression coefficient value of the locus of control shows that externals are underperforming internals in their average.

The results in this test confirm the findings by Hadsell (2010) which show that mastery approach, mastery, avoidance, performance, approach, performance avoidance, as well as fear of failure coefficients were all insignificant. However, locus of control in his study was found to be insignificant, which is contrary to what was found in this study. Note that the study of Zhang and RiCharde (1999) mentioned earlier which shows a positive effect of internals on exam average is consistent with the finding in this study. In this study the negative sign is the result of external effect on student performance, which supports the results of their study. The results of debilitating anxiety support the finding reported by Defenbacher (1977) which shows the negative and significant influence of this variable on student performance. Model III, which includes the significant variables from Model I and Model II, seems to provide a better specification of the determinants of student performance as reflected by their average exam. The GPA is positive in its effect on average score, with a coefficient value of 7.793 and a t value of 2.309, which is significant at the 5 percent level. Locus of control has a small coefficient value of -0.626 with a t value of -1.832, which is significant at the 10 percent level. Debilitating test anxiety appears to have a very strong impact on student performance, with a coefficient value of -6.089 and a t value of -3.099, which is significant at the 1 percent level. Apparently, those students who suffer from debilitating test anxiety may end up wiping out all of the gains obtained from their GPA performance due to their worries about taking exams. So the predicted gain from higher GPA is negated by their inhibiting test anxieties.

Conclusion

Much has been written in economic education about the determinants of student achievement, including student personality type as measured by Myers-Briggs Type Indicators. But this paper is the first to explicitly examine student personality on the basis of two prominent theories in educational psychology, namely locus of control and achievement goal theory combined to unveil personality traits and motivation based on social-cognitive behavior. This paper adds knowledge to the field of economic education by quantifying motivational attributes that may affect student motivation and academic achievement. It shows that internals behave differently than externals in terms of the commitment to achieve a task as well as the effort to accomplish it. This is reflected in their differences in terms of learning the material as well as their learning outcomes.

The evidence in this paper indicates that internals pursue deep learning strategies while externals follow a surface learning approach. As a result of this, internals on the average achieve better grades than externals. They also seem to be more in control of their environment and as such suffer less debilitating test anxiety than externals. The lesson to educators is that the classroom environment created by the teacher, whether it is mastery or performance oriented, could have an impact on learning outcomes.

This is if we assume that locus of control behavior can be modified. There are some who argue that a person's locus of control is an inherited trait (Pedersen et al., 1989). If this is the case, then the influence of a teacher in the classroom setting will be of little value in changing locus of control behavior. However, a study by Lindeman, Duek, and Wilderson (2001) tested 91 dental 115 medical students entering the class of 1998 at the University of California, Los Angeles, showed that dental students entered with more of a surface approach than medical students, and both groups appeared to regress to the mean by the time of graduation. Another study conducted by Linda Reed for her Doctor of Education dissertation revealed that internal locus of control frequencies decreased for the 153 medical students and increased for the 27 physicians' assistants who participated in her study at the Medical School of the University of North Texas by the end of the semester of the study (2007). Obviously, cognitive learning approach can change over time and the instructor could have an impact in the classroom in modifying external orientation in a positive way, but it also could move in another direction. The results of this paper also indicate that locus of control along with debilitating test anxiety are important determinants of student achievement. Of course, this study is based on a sample given in one course and obviously much more research is needed to add to the knowledge in this area. Aside from what is being investigated in this paper, other topics that should be of interest in future research including task difficulty, alienation, non-cognitive learning approach, and high risk students vs. low risk students, to mention a few. This paper attempts to fill some of this gap in economic education.

Variable	Mean	SD	Variable	Mean	SD
Locus			Study Time		
Internals	5.091	2.467	Internals	2.909	0.921
Externals	12.476	2.754	Externals	2.727	1.32
GPA			Procrastination		
Internals	3.262	0.489	Internals	2.760	0.484
Externals	3.200	0.419	Externals	2.809	0.386
Average Score			Mastery Approach		
Internals	79.303	11.363	Internals	4.682	0.487
Externals	72.030	12.169	Externals	4.439	0.588
Age			Mastery Avoidance		
Internals	21.363	2.985	Internals	4.075	0.861
Externals	23.454	4.554	Externals	4.031	1.018
Gender			Performance Approach		
Internals	0.727	0.785	Internals	4.031	1.033
Externals	0.500	0.512	Externals	4.152	1.536
Employment			Performance Avoidance		
Internals	2.545	2.041	Internals	3.834	1.292
Externals	1.591	2.085	Externals	3.848	1.225
Standing			Debilitating Test Anxiety		
Internals	2.955	0.785	Internals		
Externals	3.136	0.990	Externals	2.677	0.921
				2.995	0.643
Race			Facilitating Test Anxiety		
Internals	0.636	0.492	Internals		
Externals	0.363	0.492	Externals	2.949	0.772
				2.762	0.671
Attendance			Fear of Failure		
Internals	3.000	1.718	Internals	3.189	0.890
Externals	3.333	1.688	Externals	3.209	1.028

Locus of Control: The class is divided equally with a median locus score of 8.50.

GPA is the self reported GPA at the time of the survey.

Age represents the age of students at the time of the survey.

Gender (0 = female, 1= male)

Employment Per week (0=unemployed, 1=less than 5 hrs, 2=5-15, 3=15-25, 4=25-35, 5=above 35)

Standing (1= freshman, 2 =sophomore, 3= junior, 4 =senior, and 5= other)
 Race (0 = nonwhite, 1 = white)
 Attendance (1= low level, 5= high level)
 Study Time Per week (1=0-2 hrs, 2=2-4, 3=4-6, 4= > 6)
 Procrastination (1=low level, 5=high level)
 Mastery Approach (1= low level, 5= high level)
 Mastery Avoidance (1= low level, 5= high level)
 Performance Approach (1= low level, 5 high level)
 Performance Avoidance (1= low level, 5= high level)
 Debilitating Test Anxiety (1= low level, 5= high level)
 Facilitating Test Anxiety (1= low level, 5= high level)
 Fear of Failure (1= low level, 5= high level)

	Average Score	Age	Employment	Gender	Race	Debilitating Test Anxiety	Mastery Approach
Mean w/Internally Oriented	79.303	21.455	2.545	0.727	0.636	2.677	4.682
Mean w/Externally Oriented	71.030	23.435	1.591	0.500	0.363	2.995	4.440
Variance w/Internally Oriented	129.121	8.636	4.165	0.208	0.242	0.849	0.237
Variance w/Externally Oriented	148.084	20.736	4.348	0.262	0.242	0.413	0.353
Observations w/Internally Oriented	22	22	22	22	22	22	22
Observations w/Externally Oriented	22	22	22	22	22	22	22
t Stat	2.049**	-1.566*	1.535*	1.555*	1.837**	-1.383*	1.479*
p (T<=t) one-tail	0.023	0.063	0.066	0.068	0.037	0.087	0.0735

*significant at the .10 level **significant at the .05 level

Variable	r	p
Locus of Control vs. Average Score	-0.362***	0.008
Locus of Control vs. Debilitating Test Anxiety	0.266**	0.040
Locus of Control vs. Procrastination	0.220*	0.076
Locus of Control vs. Mastery Approach	-0.228*	0.068
Locus of Control vs. Employment	-0.2098*	0.0858
Locus of Control vs. Race	-0.2649**	0.0411

*significant at the .10 level **significant at the .05 level ***significant at .01 level

Independent Variable	Model I	Model II	Model III
Constant	48.981*	128.227***	73.248***
	(2.759)	(6.652)	(5.475)
GPA	10.362**		7.793**
	(2.255)		(2.309)
Standing	0.273		
	(0.115)		
Gender	0.716		
	(0.179)		
Race/Ethnicity	4.084		
	(1.027)		
Age	-0.410		
	(-0.712)		
Employment	-1.152		
	(-1.176)		
Study time	0.730		
	(0.362)		
Attendance	-0.177		
	(-0.147)		
Locus of control		-0.825**	-0.626*
		(-2.227)	(-1.83)
Procrastination		-0.854	
		(-0.482)	
Mastery		-4.018	
		(-1.210)	
Mastery avoidance		2.379	
		(1.137)	
Performance		-0.983	
		(-0.446)	
Performance avoidance		2.306	
		(1.141)	
Fear of failure		-2.681	
		(1.236)	
Debilitating test anxiety		-7.662***	-6.089***
		(-3.083)	(-3.100)
Facilitating test anxiety		-3.288	
		(-1.198)	
Regression Statistics			
Observations	44	44	44
R ²	0.22	0.44	0.407
Standard Error	11.945	10.266	9.745
F	1.234	2.974	9.144

Note: The upper number for each independent variable is the estimated regression coefficient. The lower numbers in parentheses are t-Statistics. *significant at 0.10 level, **significant at 0.05 level, and *** significant at 0.01 level.

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