The Relationship Of Self-Efficacy and Self-Concept To Academic Performance In A College Sample: Testing Competing Models and Measures

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Abstract
Self-efficacy is a construct that describes how confident people believe they are or how much control they believe they have in their ability to reach a goal or accomplish a task (Bandura, 1997). Self-concept describes what you know and understand about yourself in terms of your thoughts and feelings (Choi, 2005). Both constructs are influential in terms of task choice, performance, effort, and perseverance (Bandura, 1997; Reynolds, 1988). High levels of self-efficacy are reliable predictors of academic achievement (Bandura, Barbaranelli, Caprara & Pastorelli, 1996); self-concept is also thought to be a reliable predictor of the same. The study described in this thesis assesses the relationships between among self-efficacy, self-concept and academic performance as measured by grade point average. A model using three measures of these constructs was found to be a significant predictor of grade point average for college students. Implications and limitations are discussed.

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THE RELATIONSHIP OF SELF-EFFICACY AND SELF-CONCEPT TO ACADEMIC PERFORMANCE IN A COLLEGE SAMPLE: TESTING COMPETING MODELS AND MEASURES

A THESIS SUBMITTED TO THE FACULTY OF SCHOOL OF PROFESSIONAL PSYCHOLOGY PACIFIC UNIVERSITY FOREST GROVE, OREGON BY JOEL N. LAMPERT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN CLINICAL PSYCHOLOGY 27 JULY 2007

APPROVED: Alyson L. Burns-Glover, PhD Daniel S. McKitrick, PhD
ABSTRACT

Self-efficacy is a construct that describes how confident people believe they are or how much control they believe they have in their ability to reach a goal or accomplish a task (Bandura, 1997). Self-concept describes what you know and understand about yourself in terms of your thoughts and feelings (Choi, 2005). Both constructs are influential in terms of task choice, performance, effort, and perseverance (Bandura, 1997; Reynolds, 1988). High levels of self-efficacy are reliable predictors of academic achievement (Bandura, Barbaranelli, Caprara & Pastorelli, 1996); self-concept is also thought to be a reliable predictor of the same. The study described in this thesis assesses the relationships among self-efficacy, self-concept and academic performance as measured by grade point average. A model using three measures of these constructs was found to be a significant predictor of grade point average for college students. Implications and limitations are discussed.
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INTRODUCTION

"Excellence is achieved by the mastery of fundamentals."

-- Vince Lombardi

Self-Efficacy and Academic Outcomes

"More students leave their college or university prior to degree completion than stay" (Tinto, 1993, p. 1). Such findings have serious negative implications for higher education. While colleges and universities are making serious attempts to combat the problem, many institutions have found such attempts only marginally successful. As a result institutions have shifted their focus towards retention as a more promising means of maintaining enrollment (Tinto, 1993). One way institutions can promote student success, and subsequent retention, is by concentrating their focus on academic preparation and specifically "non-cognitive" factors.

By increasing attention on non-cognitive factors of success, institutions may be better able to predict academic outcomes in college. Non-cognitive factors include self-concept, self-efficacy, and other student perceptions (Carter, 2006). Self-efficacy and self-concept, with specific focus on academics are
examined in the current study. A model (refer to Figure 1 on p. 22) is tested for its ability to predict the *sine qua non* of academic achievement, cumulative grade point average (GPA) for college students.

Albert Bandura defines self-efficacy as “the beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (1997, p. 3). More generally, self-efficacy is how confident people believe they are, or how much control they believe they have in their ability to reach a goal or accomplish a task. This sense of control is of fundamental importance in everyday life because, theoretically, people who lack the control in their lives to produce a desired effect are individuals who will have little incentive to put forth any effort towards achievement. In the academic context, children’s beliefs in their personal efficacy to control their own educational processes and outcomes, and to become proficient in challenging subject matter, likely has a great impact on their scholastic impetus, interest, and achievement. Such a theory would predict that children with high levels of efficacy are generally higher achievers than those who have lower levels of efficacy. Indeed, high efficacy levels are robust predictors of academic achievement, positive social relationships and prosocial behaviors (Bandura, Barbaranelli, Caprara & Pastorelli, 1996). Children’s efficacy beliefs begin to influence future objectives at an early age. Essentially, the higher a child’s efficacy level, the more career options he or she will consider later in life, and the better he or she will prepare scholastically for overall success. This may be generalized to other populations
such as college students and adults to mean that the higher one's level of efficacy, the more overall success and opportunity he or she is likely to experience in life.

Conversely, Bandura et al. (1996) also found that low efficacy levels frequently lead to feelings of futility and melancholy. However, as put forth in the idea of Bandura’s Social Learning Theory, this is not inevitable. In fact, through socialization and modeling, people often learn to manage themselves and embrace standards that serve as personal regulators for courses of action in many situations (Grusec, 1992). In essence, a large part of learning occurs through observation of models. People, if exposed to appropriate models, will develop correspondingly appropriate methods of coping. Thus, efficacy is dynamic and changes as individual socialization patterns change.

Self-Control and Self-Regulation

The element of control over one's own life, as well as a pro-social orientation, is a prophylactic against feelings of uselessness and depression (Bandura et al., 1996). Specifically, self-regulatory practices (such as the ability to exercise impulse control) play a key role in educational self-development. People who are good self-regulators perform much better academically than those who are not, precisely because they have “a high sense of efficacy for self-regulated learning and academic mastery” (Bandura et al.). With the continuous development and integration of technology and education, students are now educating themselves more than ever before. The self-regulatory practices
required for this are of utmost importance in relation to educational technology due to the independent, self-directed nature of these practices. As stated above, students must be good self-regulators in order to perform well academically, and thus be more successful. Similarly, students who have good pro-social relationships generally have higher senses of efficacy and self-regulation (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003).

Protective and Risk Factors for Self-Efficacy

Extensive research has been conducted regarding self-efficacy, beginning with Bandura's (1977) introduction of the concept. Since that time, self-efficacy research has been expanded to many areas including motivation, self-regulation, athletic performance, and relationship to clinical problems, among others (Pintrich & Schunk, 1995; Barling & Abel, 1983; Davis & Yates, 1982). In relation to educational research, three areas concerning self-efficacy have been examined: efficacy beliefs and college major/minor choices; teacher efficacy and student outcome; and student efficacy, motivation, performance, and academic achievement (Pajares, 2007). Common among most of the self-efficacy research is the notion of trying to explain individual variations in self-efficacy and the implications of these variations (Pajares).

Pajares (2007) cites Bandura (1986) in explaining that although the process of self-reflection is important in the process of evaluating one's experiences and thought processes, it is the beliefs about one's capacities that are truly indicative of performance/behavior. However, "[t]his does not mean that people can
accomplish tasks beyond their capabilities simply by believing that they can, for competent functioning requires harmony between self-beliefs on the one hand and possessed skills and knowledge on the other” (Pajares, p. 3). In actuality, self-efficacy beliefs influence motivation and self-regulation—the choices people make and the actions they undertake. Further, strong self-efficacy beliefs can enhance our ability to accomplish great undertakings, as well as our personal well-being (Pajares). Naturally then, efficacy beliefs influence our expectations of certain outcomes. For example, a student who is confident in his or her academic abilities will likely expect to perform better on an exam than a student who is not confident. In contrast, however, other researchers (Marzillier & Eastman, 1984) argue that efficacy beliefs can be influenced by imagined outcomes and as such, if a negative outcome is imagined, the intended behavior may be altered.

Other factors also influence self-efficacy beliefs. First, direct familial influences, such as parents, must be emphasized. Recalling assertions made by Bandura et al. (1996), one understands that parents have an unequivocal effect on the efficacy levels of their children. In addition to the influence afforded by parents directly, there are other, less direct, influences contributing to children’s levels of efficacy. For example, socioeconomic status can be a predictor. In fact, Bandura et al. found that families with higher socioeconomic status had higher academic and occupational aspirations for their children. In addition, familial socioeconomic status relates to children’s career routes (Bandura, et al., 2001), likely because the parental careers necessary to attain such status are modeled
effective assessments available to college teachers. For example, assessment through self-evaluation using teacher-developed checklists and portfolios allows students to adopt active roles in the educational process, and further promotes efficacy. By implementing such options, teachers provide students with choices, encourage the use of stratagems, make more viable methods of assessment available, and increase the engagement of low performing students. The overall effect of these changes theoretically leads to the development of students with higher levels of self-efficacy.

Although efficacy has thus far been discussed as influencing motivation, the two constructs are actually reciprocally related. That is, motivation is also an important factor in increasing efficacy levels and should be considered when teachers are attempting to increase student efficacy levels. In fact, Linnenbrink and Pintrich (2003) assert that motivation is a significant concern for teachers because sentiments and convictions about interest and worth guide students to be more engaged, resulting in a higher quality of experience and learning. As a result, if students are motivated in a positive manner, they will likely be more apt to take initiative to make positive choices, thereby engaging students in a cycle of hard work and success.

In other words, students are able to develop better senses of competence and self-efficacy when they are allowed to make choices regarding their education. The support for this statement lies in the logic that if students are more interested, they are usually willing to work harder on topics they choose. In
addition, students who make their own choices regarding literacy (e.g. reading what they want to read) are more motivated to succeed, and are much more engaged in their programs (Walker, 2003).

Walker (2003, p. 186) states that "by giving choices, teaching literacy strategies, providing for self-evaluation, and changing the assessment context, teachers can lead students to experience more positive affect during challenging tasks." Schunk and Zimmerman (1997) support this in their assertion that teachers helping students learn a better strategy can help students enhance their learning. In short, understanding efficacy and capitalizing on it through innovative methods will promote higher levels of self-efficacy, and likely advance student academic performance. One of the goals of teaching is to provide a comprehensive education that generates students who are able to think independently, and ultimately be productive members of society. As the university president, Sidney Harper Marsh said, "It is intended that the study and instruction here given shall cultivate the power of right thinking and ground the student in the principles of right action" (c. 1850).

In addition to choice, Solberg, (1997) found that self-efficacy accounted for 27% of the variance in college adjustment for Hispanic students. Solberg also noted that self-efficacy and social support combined accounted for 33% of variance in college adjustment. The complete model that Solberg tested, however, included stress, self-efficacy, social support, acculturation, and gender. A total of 46% of variance is accounted for by the model. Similarly, Chemers, Hu,
and Garcia (2001) found that self-efficacy and optimism are strongly associated with academic performance. Such findings indicate that choice is but one of several other factors that influence academic performance in college students. These factors must be taken into consideration when attempting to bolster academic performance, serving as one of the reasons colleges and universities often have specialized offices and staff dedicated to specific aspects of student life and support.

The corpus of data indicate that students who achieve higher academic success have higher levels of self-efficacy and are generally well supported or at least perceive that they are well supported. Given that students are under pressure to perform well academically, as well as in extra-curricular activities, it is important to their academic success that they have a high level of self-efficacy. In addition to the self-efficacy, the notion of self-concept is also examined.

Self-Concept as Distinct from Self-Efficacy

Bong and Clark (1999) note that self-concept is multidimensional in nature because it has both cognitive and affective components. Self-concept is more broad-based than self-efficacy in that it “is a composite of cognitive description of one’s attributes and affective evaluation of those attributes in comparison with others” (Choi, 2005, p. 198). In addition, self-concept, like self-efficacy, may be viewed as a hierarchical construct that includes several components, one of which is academic self-concept. Academic self-concept involves “a mixture of self-beliefs and self-feelings regarding general academic function” (Lent, Brown
& Gore, 1997, p. 308); in more general terms, self-concept is what you know and understand about yourself in terms of your thoughts and feelings (Choi). Further, Choi notes that self-concept may not be as valid of a predictor for academic success as context-specific self-efficacy. However, it is still likely to be a strong predictor.

Given this information, it is apparent that self-efficacy and self-concept cover similar domains of functioning and self-perception. Nonetheless, there are inherent differences between the two constructs. One difference between the two constructs has to do with self-comparison. Self-comparison refers to an individual comparing him- or herself to others, and therefore, heavily influences self-concept (Bong & Clark, 1999). In contrast, comparing only one’s own current and past performance is key in influencing self-efficacy.

The Lake Wobegon Effect

Several researchers have found that students commonly misreport their grade point average (GPA) in situations where they are asked to self-report (Wilson & Zietz, 2004; Zimmerman, Caldwell, & Bernat, 2002). This concept has previously been dubbed the “Lake Wobegon” effect by Maxwell and Lopus (1994). The name comes from the American Public Radio show “A Prairie Home Companion” in which Garrison Keillor declares that in the little town of Lake Wobegon, “all the women are strong, all the men are good-looking, and all the children are above average” (Lee, 1991). Thus, by over-estimating their GPA, (Zimmerman et al., 2002), students may be striving to fulfill the common Lake
Wobegon stereotype that "all the children are above average." All this being said, such trends do not always hold true. In fact, Hishinuma et al. (2001) found a 0.76 correlation between actual and self-reported GPA for students who identify as Asian/Pacific Islander, indicating that students in this group do not necessarily misreport their GPA. Regardless, Hishinuma et al. and Herman (2003) both suggest caution when using self-reported GPA for research purposes. Herman goes on to suggest that there is a significant unexplained variance between self-reported GPA and actual GPA, although Herman did not explicitly study Asian/Pacific Islanders.

Purpose of the Current Study

The purpose of the current research is to assess the relationships among self-efficacy, academic self-concept, and academic performance [as measured by cumulative grade point average] of college students. Variations of two non-cognitive factors, self-efficacy and self-concept, previously recognized as being potentially influential (Walker, 2003; Reynolds, 1988) in the level of academic performance exhibited by students are examined for the feasibility of predicting academic performance (Table 1). Last, a brief examination of the Lake Wobegon effect will be undertaken.
Table 1.  
**Explanation of Constructs**

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<tr>
<th>Construct</th>
<th>Theoretical Assumptions</th>
<th>Measures Chosen</th>
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<tr>
<td>Academic Self-Concept</td>
<td>Non-cognitive component of college success developed as a more specific element of self-concept (Reynolds, 1988)</td>
<td>Academic Self-Concept Scale</td>
</tr>
<tr>
<td>Academic Self-Efficacy</td>
<td>Non-cognitive, specific, measure of self-efficacy, focused on mastery (Owen &amp; Froman, 1988)</td>
<td>College Academic Self-Efficacy Scale</td>
</tr>
<tr>
<td>Generalized Self-Efficacy</td>
<td>Non-cognitive, overall general measure of self-efficacy, with specific subscales focused on mastery (Sherer et al., 1982)</td>
<td>Self-Efficacy Scale</td>
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Note. Self-concept may be perceived to be fundamentally designed as a more theoretical construct, whereas self-efficacy is perceived as much more concrete in nature and focused on mastery.

Specifically, the following questions are asked: do demographically different participants significantly vary in how they respond on the measures used; does each scale predict variance in GPA; and how well does the model represented by the College Academic Self-Efficacy Scale (CASES), the Self-Efficacy Scale (SES), and the Academic Self-Concept Scale (ASCS) predict variance in GPA? The hypotheses tested in this study are:

1. CASES, SES, and ASCS will predict significant variance in the GPA
2. Different demographic groups (entering freshman vs. transfer student, traditional vs. nontraditional aged, ethnicity, etc.) will not vary in their scores on the CASES, SES, and ASC nor in GPA.
3. The complete model (CASES, SES, and ASCS, combined) will be a more powerful predictor (higher R squared) than any one measure alone.
4. Self-efficacy is a better predictor of GPA than self-concept.

5. The Lake Wobegon effect will not hold true for this sample given the unique demographic makeup of the study population.
freshmen (at the time of matriculation), in that they went to college directly out of high school and did not transfer between institutions.

Materials/Instruments

Three instruments were used in the current study. These were the College Academic Self-Efficacy Scale (CASES, Owen & Froman, 1988) which measured self-efficacy specifically for academics in college; the Self-Efficacy Scale (SES, Sherer et al., 1982), which is designed for measuring more general self-efficacy as well as social self-efficacy; and the Academic Self-Concept Scale (Reynolds, 1988), or ASCS, which measures academic self-concept. These measures were selected because each operationalizes potentially influential, non-cognitive factors found to predict college performance. In addition, each participant was asked to fill out a Demographic Information Form (Appendix A), and, as part of the Informed Consent Document (Appendix B), was also asked to allow the researcher access to their academic records (GPA) from the University Registrar.

College Academic Self-Efficacy Scale

The CASES is a 33-item self-report measure (Appendix B) designed to measure academic self-efficacy by asking students to rate how confident they feel regarding their abilities to perform common academic-related behaviors in college (Owen & Froman, 1988). The questionnaire uses a 5-point Likert-type scale that ranges from "Lots" (choice 'A') to "Little" (choice 'B'). An example item is: "understanding most ideas presented in class." This measure was selected for this research because it is constructed to be a measure of relative
specificity for academics rather than the more general constructs of self-concept and general self-efficacy.

When Owen & Froman (1988) examined the test-retest reliability of the CASES, they administered the questionnaire twice over an 8-week period and noted alpha coefficients of .90 and .92, respectively. The authors also reported a test-retest reliability of .85 after the 8-week interlude between administrations. In the current study, the alpha coefficient is .87.

Self-Efficacy Scale

The SES is a 30-item self-report measure (Appendix C) designed to measure general self-efficacy as well as social self-efficacy (Sherer et al., 1982). General self-efficacy is the most global form of self-efficacy that was measured in the current study and is proposed by the authors of the scale to not be task-specific (Sherer et al., 1982). Aside from general self-efficacy, five items on the scale were devoted to the assessment of social self-efficacy, while seven items were used as filler. The measure of general self-efficacy as well as a specific aspect of the construct make this questionnaire a good complement to the CASES. The questionnaire used a 5-point Likert-type scale ranging from “Disagree Strongly” (choice ‘A’) to “Agree Strongly” (choice ‘E’). An example of an item designed to assess general self-efficacy is “when I make plans, I am certain I can make them work;” an example of an item designed to assess social self-efficacy is “it is difficult for me to make new friends;” and an example of a filler item is, “I like to grow houseplants.”
Each scale of the questionnaire is scored independent of the other; filler items are not scored. In the original validation study for this scale, Sherer et al. (1982) noted Cronbach alpha coefficients of .86 and .71 for the general and social self-efficacy subscales respectively. In the current study, alpha coefficients of .79 for the general subscale and .57 for the social subscale were found. From this, it is likely that, as Choi (2003) reported, scores on the general subscale are more reliable than scores on the social subscale.

Academic Self-Concept Scale

In the current study, self-concept was measured using the ASCS (Reynolds, 1988; Appendix D), which is a 40-item self-report measure. The questionnaire used a 4-point Likert-type scale to measure an academic aspect of general self-efficacy. Reynolds (1988) noted that although general self-concept has not been found to be a significant predictor of academic success, as measured by GPA, the related construct of academic self-concept should be a much better predictor. This measure was selected for use in the present study in addition to the measures of self-efficacy because it is an additional non-cognitive construct that may play a role in achieving academic success. As well, this is conceptually different than the others in what it purports to evaluate. A sample item is, “I do well in my courses given the amount of time I dedicate to studying.” Further, the overall ASCS reported alpha coefficient was .91. In the current study and sample reported, the measure also was internally reliable ($\alpha=.90$).
Procedure

Approval for this study was obtained from the Institutional Review Board at Pacific University in Forest Grove, Oregon (#055-07) and data collection occurred during April and May, 2007, at a small liberal arts university in the Pacific Northwest. Undergraduate students were recruited in psychology courses, the student union building, and in residence halls. Participants were provided with a packet prepared in advance, and an envelop containing study materials (CASES, ASCS, SES, and demographic information form), informed consent forms, and a ticket which could be filled out for a chance to win a drawing for a gift card. As part of the demographics, participants were also asked to report their overall GPA. Participants' actual GPAs were then obtained from the University Registrar via special release detailed in the informed consent form.

Participants were briefed about the informed consent and study procedures, asked to complete the study materials and then to return the completed packet to the researcher via the campus mail system or a research assistant. As noted above, the number of packets distributed was 150 and of those, 85 were returned. Completed and viable data packets numbered 81 (95.3% usable rate). Data were analyzed using SPSS 14.0 (SPSS, Inc., 2005).
RESULTS

This study was designed to test two opposing models of academic performance: self-efficacy and self-concept. Self-efficacy theory requires that measures of the construct be task-specific, although general self-efficacy is also measurable (Bandura, 1997). In this case, the Self-Efficacy Scale includes a general, as well as a social subscale. In addition, a specific measure of Academic Self-Efficacy is used. These measures are compared with a measure of academic self-concept, which is intended to be specific, but which does not focus on mastery. For this research, these measures are intended to be predictors of college GPA.

The choice of regression model was made based on the results of demographic analyses of participants' variations on the GPA, and four predictor variables (CASES; ASCS; Social Self-Efficacy, and General Self-Efficacy). No statistically or clinically significant demographic (age, ethnicity, year at school, etc.) differences were found among participants. Given this, the final regression model included only the four predictor variables themselves.

Descriptive Results

All measures used in this research had good to high reliability levels (Pallant, 2006, p. 92). The CASES demonstrated good internal consistency with a
Cronbach alpha coefficient of 0.87. The general scale of the SES has good internal consistency with a Cronbach alpha coefficient of 0.83. The social scale of the SES has good internal consistency with a Cronbach alpha coefficient of 0.66. The ASCS had good internal consistency with a Cronbach alpha coefficient of 0.66.

Demographic Information For The Current Sample

The ranges and means for this sample are reported in Appendix F. Overall, the sample is representative of the population studied. Principle demographic elements of the study participants are reviewed above. Although the current sample generally compares favorably with prior studies in terms of ethnic diversity, gender ratio, and age, this sample does have a significantly higher percentage of participants who identify as Asian/Pacific Islander than other studies (Choi, 2005; Elias & Loomis, 2000).

Building the Prediction Model: Self-Efficacy vs. Self-Concept

A multivariate regression analysis was performed using the ASCS, CASES, and SES (which includes both general and social subscales) as predictors to estimate variance in the criterion variable, Actual GPA. Actual GPA alone was used as the criterion because there was no statistically significant difference between actual and reported GPA. Thus, only actual GPA was used in the model (Figure 1). The results of the regression are displayed in Table (2).
Figure 1. *Diagram of Model 1*. Beta (β) coefficients are reported.

Table 2.

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Results of multivariate regression analysis using predictors: (Constant), SUMASCS, SUMSESSocial, SUMOFCASES, SUMSESGeneral.

From the regression model summary, it is evident that the model as a whole predicts nearly 18% of the variance in GPA (p=.003). In addition, ANOVA results indicate that the model is significant [F(4,61)=4.55, p=.003]. However, what is not known is which predictors made the largest contribution to the predictive value of the overall model. Therefore, the relative benefits of the specific versus global measures of self-efficacy needed to be tested. A
hierarchical regression analysis was used to resolve this question. To that end, a second model (Figure 2)

![Diagram of Model 2: Testing two competing models of Academic Performance: Self-Concept vs. Self-Efficacy. The ASCS and the SES General scale make no unique contributions to the model; however, the CASES and the SES Social scale are significant. Beta (β) coefficients are reported.](image)

was tested, where ASCS and CASES were held constant and then the relative effects of General and Social scores were regressed on GPA. The results of this model are displayed in Table (3).

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<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
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Results of hierarchical regression analysis using first, predictors: (Constant), SUMASCS, SUMOFCASES; and second, predictors: (Constant), SUMASCS, SUMOFCASES, SUMSESSocial, SUMSESGeneral.

This model allows one to conclude that academic self-efficacy is a good predictor of GPA (β=.294; p<.05). In fact, academic self-efficacy, which is a specific construct, is a better predictor of GPA than academic self-concept or
general self-efficacy even when the deleterious effects of social self-efficacy ($\beta=.378, p<.05$) are partialed out. Thus, we may conclude that the most significant predictor used in the model is the measure of academic self-efficacy, although social self-efficacy is also shown to have a significant effect. Further, when the CASES and social self-efficacy subscale of the SES are correlated with GPA (social held constant), the CASES is still statistically significant ($r=.378; p<.05$).

Parsimony would require that if only one scale were available to predict GPA, the CASES is the best measure tested in this model. However, the social scale of the SES might also be useful to identify how social efficacy (or lack of it) affects GPA given its negative correlation. The social self-efficacy negative correlation appeared to be curvilinear: an inspection of the scatterplot indicated those very high on social self-efficacy and those very low on social self-efficacy had the lower GPAs (Figure 3).

![Figure 3. Scatterplot of the Social Scale of the SES and Actual GPA. Note the curvilinear relationship apparent between the two variables.](image-url)
However, in the absence of knowing the participant’s general self-efficacy, one could still predict a participant’s score by knowing his/her score on the CASES. Finally, the CASES and the ASCS are distinct constructs that, although similar in some aspects, are fundamentally different in others. They are not significantly correlated ($r=.200; p>.05$). Therefore, self-efficacy and self-concept are both conceptually and mathematically distinct.

**Other Hypotheses Tested**

Statistically significant differences were found in two areas; class standing on the ASCS and on the social scale of the SES for participants who identified as having transferred to the university. Specifically, freshmen differed from other groups on the ASCS on three items, “most of my classmates do better in school than I do” ($F(3, 77)=4.46, p<.05$), “I feel teachers’ standards are too high for me” ($F(3, 77)=4.01, p<.05$) and “I enjoy doing my homework” ($F(3, 77)=3.57, p<.05$). In addition, transfer students differed from other groups on one item, “it is difficult for me to make new friends” ($F(3, 77)=4.83, p=.05$). Regardless, these differences are minor considering their specificity and do not likely have clinical significance. No other demographic/group differences were noted.

The hypothesis that the complete model (CASES, SES, and ASCS, combined) will be a more powerful predictor (higher $R^2$ squared) than any one measure alone was supported. The model represented by the CASES, SES, and ASCS predicts approximately 18% of the variance in actual GPA ($F(4, 61)=4.55, p<.05$).

In addition, the Lake Wobegon effect does not hold true for this sample and that students’ self-reported GPA was not significantly over-estimated. The mean
self-reported GPA (~3.07 on a 4.0 scale) was slightly, but not significantly, higher than the mean actual GPA (~3.04; as reported by the University Registrar).

However, all participants were generally accurate in self-reporting their GPAs as evidenced by the significant correlation between the two variables ($r=.93$, $N=73$, $p<.001$).
DISCUSSION

First, the measures used in this study were each found to be reliable. This is expected, considering each measure has undergone construct and validation studies (Owen & Froman, 1988; Reynolds, 1988; Sherer et al., 1982). In addition, in a study similar to this one, Choi (2005) found the measures reliable for his sample.

Second, demographic information for the study participants is representative of the larger population of the campus. The university population surveyed for this study is particularly unique in that approximately 20% of the undergraduate students are from the Pacific Islands (Hawaii, the Philippines, etc.) (K. Martin, personal communication, February 19, 2007). Such research is relevant because the university where this research was conducted is a small, private, liberal arts university in the Pacific Northwest. Approximately two-thirds of the student population identified as traditional-aged (18-25 years) females which is representative of the university population. In addition, ethnic diversity among the study participants is also representative of the university population. Further, the university in question requires that all freshmen and sophomores live on campus and also plays residential host to a growing number of juniors and seniors (A. Stockman, personal communication, May 15, 2006).
The variety of class standing among participants may be accounted for, given that participants were solicited on campus in classes, residence halls, and the student center.

Third, with some exceptions, the overall demographics of the population surveyed are comparable to other populations used in similar studies (Choi, 2005). However, given that approximately 20% of the undergraduate student population at the university in question are from the islands, there is a larger percentage of participants who identify as Asian/Pacific Islander in the current sample. This is important because studies indicate that Asian/Pacific Islander students do differ somewhat in their academic attitudes (Mizokawa & Ryckman, 1990).

Although demographic differences were not statistically significant, their practical implications are discussed here. The differences found were between freshman and other student cohorts in their responses to certain items on the ASCS. The first item was, “most of my classmates do better in school than I do” (M=2.32, SD=.74). With regard to this item specifically, research on perceived norms for alcohol use among entering freshmen may be generalized for interpretation purposes. For example, Read, Wood, Davidoff, McLacken, and Campbell (2002) noted that perceived norms about alcohol use by college freshmen were significant predictors of freshmen alcohol use. Thus, it is possible that students who perceive that their classmates to be performing better than themselves may actually make that notion their reality, as was the case with
participants in the alcohol use study (Read et al., 2002), who actually drank more because they perceived that their peers drank more.

The item, "I feel teachers' standards are too high for me," (M=2.07, SD=.59), elicited stronger agreement among freshman groups than non-freshman groups. Given this, challenges to college students should be considered. Kuo, Hagie, and Miller found that the three main challenges for students in college are "balancing academic and personal life, paying for college, and academic success" (2004, p. 63). Thus, students struggle to balance their personal and professional lives, academic funding, and overall success; whilst simultaneously attempting to transition from childhood to adulthood. So much change is occurring at one time that students can become overwhelmed, resulting in academic underperformance, as well as underperformance in other areas of their lives. Being academically successful may hold different meaning for different students, and may not reflect/react to teachers' standards as much as personal standards. For example one anonymous student interviewed in a previous study (Lampert, 2007) reported

...if I looked back on it I honestly did everything I could in that class...and it's a matter of...the professor and I hav(ing) not seen eye to eye. I guess my motivation there goes from...if I've done everything I can, then the room for disappointment should be very little. The motivation...just come(s) from looking at those around me and looking at myself and saying, 'have I given everything I could to this and have I reasonably done everything I could?
part of the first year core curriculum, but who is intent on becoming a history major, may not like doing the homework for the course.

Transfer students differed (M=3.75, SD=1.04) from other groups in their responses on the item, "it is difficult for me to make new friends." The phenomenon of "transfer shock" may play a role in this as transfer students, like new freshmen, may encounter more challenges than resident students, simply because of the transition to university life is a challenging one (Hills, 1965). One can imagine what it must be like for people to make any kind of transition to a new, unfamiliar place and appreciate the potential challenges of creating a new social network for oneself. Thus, coupled with the notion that many college transfer students are of a non-traditional age (25 years or older; E. Hobizal, personal communication, May 19, 2007), and most conventional residential universities cater to a traditional aged (i.e., 18-25 years) student group, transfer students often may feel out of place and find it difficult to form relationships given the social and developmental differences between themselves and other students.

Results from this study indicate that the measures used may serve to explain academic performance as represented by actual GPA. Two measures, the CASES and the social scale of the SES, are correlated with actual GPA (as noted above), and thus, may serve as predictors, albeit not necessarily good ones. Accordingly, the coefficient of determination for the CASES is 0.06 and the percent of variance in actual GPA that it accounts for is 5.76%—meaning that students’ scores on the CASES can account for/explain 5.76% of the variance in
actual GPA. Likewise, the coefficient of determination for the social scale of the SES is 0.0676, and the percent of variance in actual GPA that it accounts for is 6.76%—meaning that students’ score on the social scale of the SES can explain 6.76% of the variance in actual GPA.

Further, the model as represented by the CASES, SES and ASCS is also shown to predict actual GPA. In fact, the model as a whole predicts approximately 18% of the variance in actual GPA. This is much better than other measures purported to predict GPA such as the Scholastic Aptitude Test (SAT), which consistently predicts 11.7% of the variance in GPA for white college students in predominantly white colleges (Fleming & Garcia, 1998).

Fleming and Garcia (1998) also noted that the SAT predicts about 9.9% of the variance in GPA for Black students attending predominantly white colleges. In addition, Fleming (1990; as cited in Fleming & Garcia) reported that SAT scores predicted an average of 20.1% of college GPA for Black students at Black colleges (Figure 4).
However, there seems to be some controversy over this finding in that arguments can be made that the SAT does not predict academic performance for Black students (Boyd, 1977); there are strong, positive correlations for SAT and GPA for Black students (Morgan, 1990); and that students actually performed worse (Vars & Bowen, 1998) or better (Houston, 1983) than their test scores indicate they should. Fleming notes that "over-prediction (performing worse) is the most consistent occurrence in Black predictive validity studies" (2002, p. 283). Overall, the predictive value of the model used in the current study is greater than that of the SAT alone.

Finally, the Lake Wobegon effect did not hold true for the current study population. Although there is a possibility that the slight difference in self-reported GPA and actual GPA is somehow meaningful and ultimately
supportive of the Lake Wobegon effect, the actual difference of .03 is rather insignificant in terms of real-world application. Participants were fairly accurate in reporting their GPA’s, and it is possible that difference between reported and actual GPA values could be accounted for by misremembering. One participant commented that she could not remember the actual value of her GPA, but reported what she perceived to be a close estimate instead (Participant 39, personal communication, April 27, 2007). This suggests that estimates, among other reasons, may be to blame for misreported GPA.

Although the results of this study are largely in keeping with previous work, they should be generalized with caution. The sample originated at a small, private, liberal arts university and may not be representative of the general college student population. In addition, the ethnicities represented in the current sample population, although representative of the greater university population, are not necessarily representative of other institutions—this is an important distinction given the discrepancies found between predictability of the SAT for White and Black students (Boyd, 1977; Fleming, 1990; Fleming & Garcia, 1998; Fleming 2002; Houston, 1983; Morgan, 1990; Vars & Bowen, 1998), and presumably other groups as well. It should also be considered, given this information, that replication of this study in other areas of the country and dissimilar institutions may garner different results, especially given that Sue (1999) reports that the SAT Math and SAT Verbal scores have different predictive abilities for Asian American and European American students’ first year grade point averages. Last, although the measures in this study were found to be
generally reliable for the current participants, the author did not assess the validity of the measures across ethnic groups. Therefore, the applicability of results from this study with reference to varying ethnic groups is unknown.

In summary, the findings of this study indicate that the model presented (CASES, SES & ASCS) is a better predictor of actual college GPA than is the SAT alone. From this, it may be inferred that colleges and universities that currently require the SAT as part of admissions criteria should adopt measures of self-perception, rather than standardized tests alone, as predictors of academic performance. Before colleges and universities make a move to change their admissions criteria however, more research is needed to refine the model, explore the implications of its use with diverse populations, and compare the predictive abilities of it to those of other measures of academic success, such as the ACT and other admissions criteria. In addition, the Lake Wobegon effect may or may not have real-world implications, and more research is needed in this area to make a more definitive conclusion about the phenomenon of misreporting GPA amongst college students.

Current applications for this study may include students completing the measures used here and determining areas of self-efficacy and self-concept where they are lacking. The use of such measures for self-assessment and reflection could be used to aid tutors, mentors, faculty, or mental health professionals in their work with students. If students can improve in these areas and results of the current research hold true upon replication, students scoring better on these measures will likely perform better academically. If this is the
case, it is suggested that colleges and universities devote more resources to helping students increase self-efficacy and self-concept.
REFERENCES


SPSS for Windows, Rel. 8.15.5. 2005. Chicago: SPSS Inc.


APPENDIX A
Demographic Information Form
The Relationship of Self-Efficacy and Self-Concept to
Academic Performance in a College Sample:
Testing Competing Models and Measures

Age (years): __________

Gender: __________

Class Standing:
☐ Freshman
☐ Sophomore
☐ Junior
☐ Senior
☐ 5th year or higher

I came to Pacific as a:
☐ new freshman
☐ transfer student

If I transferred to Pacific, I came from a:
☐ community or junior college in state
☐ community or junior college out of state
☐ four year college/university in state
☐ four year college/university out of state
☐ __________________________

If I transferred to Pacific, I transferred with:
☐ some college credits.
☐ a Certificate from an accredited Junior or Community College.
☐ an Associate’s Degree from an accredited Junior or Community College.

When I entered Pacific, my intended Academic Major was:

When I entered Pacific, my intended Academic Minor was: __________

I have changed my Academic Major and/or Minor since entering Pacific: YES or NO

If I changed my Academic Major and/or Minor, it/they are currently:
Academic Major(s): _______________________
Academic Minor(s): _______________________
Ethnicity:
*Note: the following is not a comprehensive list of possible ethnicities. Please write in your ethnicity, multiple ethnicities, or other descriptor of yourself that you are comfortable with, if you do not feel comfortable using those currently listed.
- [ ] Asian/Pacific Islander
- [ ] Native Hawaiian
- [ ] Native American/Alaska Native
- [ ] Black
- [ ] Hispanic
- [ ] Caucasian
- [ ] ________________________________
3. Procedures

If you agree to be in this study, we will ask you to use three scales to rate your level of self-efficacy and level of self-concept. In addition, we will ask you to provide demographic information. The entire procedure should last approximately 30 minutes.

4. Participants and Exclusion

Only participants who meet the following conditions will be included in the study: currently enrolled college students who are 18 years or older. Participants who do not meet the above criteria will be excluded from the study.

5. Risks and Benefits

There are risks to participating in this research. Although unlikely, possible risks include experiencing some dissatisfaction with your level of self-efficacy and/or self-concept and minimal chance of breach of confidentiality.

There are no direct benefits to participating in this research.

6. Alternatives Advantageous to Participants

Not Applicable.

7. Participant Payment

Should you choose to enter, at the conclusion of your participation in the study you will be eligible to win a prize drawing approximately valued at $20. This is optional and will not affect your ability to receive a participation receipt or your standing as a student or research participant. Completing or not completing your participation will not affect your eligibility for the drawing. The drawing will take place approximately one week after the conclusion of data collection. The winner will be notified via email, phone, or print mail. As with the study itself, participant data will be kept confidential. Only the principal investigator and faculty advisors will know the identity of the winner. All entry slips will be destroyed at the conclusion of the drawing.

8. Promise of Privacy

a) The records of this study will be kept private. All information provided by participants will be kept confidential and locked in a cabinet in the researcher’s office. The informed consent form and drawing entries will be kept separately
from any data that may be collected. If the results of this study are to be presented or published, we will not include any information that will make it possible to identify the individual participants. Only the principal investigator and the faculty advisors will have access to the research materials.

b) If you complete this part of our study, you may be contacted at a later date to also participate in a private interview regarding your experiences of college life. At the end of this permission slip you will be asked to check “yes, you may contact” or “no, do not contact.”

c) In order for us to fully understand the experience of students while they attend this university, we will also be asking you to provide us with a PUN ID number to cross-reference your responses to our study with the data that admissions, academic programs, financial aid, and the registrar’s office maintain. We will not report any information individually or with your name or uniquely identifying characteristics. We are only interested in analyzing and reporting general patterns among students.

9. FERPA releases:

Your signature on this informed consent form acts as a release of your educational records in keeping with the Pacific University policies and procedures for implementing the Family Educational Rights and Privacy Act of 1974 (Buckley Amendment) as contained in the student handbook. This may include but is not limited to records from admissions, registrars and financial aid offices. All of this information will only be used to correlate with other data collected in this study and to create a database of participants in the study which will follow student development and adjustment to college on this campus. Such information will never be reported in such a way that your confidentiality would be violated. Should you wish to amend this agreement to access to records, you can contact Joel Lampert, Dr. Alyson Burns-Glover, or Dr. Daniel McKitrick and remove your release. If you do not contact either the researcher or a faculty advisor, this agreement will remain in effect until the completion of your program at Pacific University.

10. Voluntary Nature of the Study

Your decision whether or not to participate will not affect your current or future relations with Pacific University. If you decide to participate, you are free to not answer any question or withdraw at any time without prejudice or negative consequences. If you withdraw you will still be eligible to obtain a research participation receipt and enter the prize drawing.
11. Compensation and Medical Care

During your participation in this project you are not a Pacific University clinic patient or client, nor will you be receiving complete psychological care as a result of your participation in this study. If you are injured during your participation in this study and it is not the fault of Pacific University, the researchers, or any organization associated with the experiment, you should not expect to receive compensation or medical care from Pacific University, the researchers, or any organization associated with the study. Should you feel the need to see psychological care, you may contact the Student Counseling Center at Pacific University (503-352-2191).

12. Contacts and Questions

The researcher(s) will be happy to answer any questions you may have at any time during the course of the study. The researcher(s) can be reached via the contact information listed on page 1 of this form. If you are not satisfied with the answers you receive, please call Pacific University's Institutional Review Board, at (503) 352-2215 to discuss your questions or concerns further. All concerns and questions will be kept in confidence.

13. Statement of Consent

I have read and understand the above. All my questions have been answered. I am 18 years of age or over and agree to participate in the study. I have been given a copy of this form to keep for my records.

Participant's Signature: ______________________  Date: ________________

Participant's PUN ID number: ______________________

Participant contact information:

Street address: ______________________

____________________

____________________

Telephone: ______________________

Email: ______________________
This contact information is required in case any issues arise with the study and participants need to be notified and/or to provide participants with the results of the study if they wish.

Would you like to have a summary of the results after the study is completed?  
__Yes __No

________________________________________  _________________________
Investigator's Signature                        Date
APPENDIX C

College Questionnaire (Academic Self-Efficacy)

DIRECTIONS. We are interested in learning more about you to help us improve our program. Your responses are strictly confidential and will not be shown to others. Do not sign your name. We hope you will answer each item, but there are no penalties for omitting an item.

Male__ Female__ Age____

Estimate your current grade point average______

How much confidence do you have about doing each of the behaviors listed below? Circle the letters that best represent your confidence.

A B C D E
Quite A Lot CONFIDENCE Very
A B C D E
Lots Little

1. Taking well-organized notes during a lecture.
2. Participating in a class discussion.
3. Answering a question in a large class.
4. Answering a question in a small class.
5. Taking “objective” tests (multiple-choice, T-F, matching)
6. Taking essay tests.
7. Writing a high quality term paper.
8. Listening carefully during a lecture on a difficult topic.
9. Tutoring another student.
10. Explaining a concept to another student.
11. Asking a professor in class to review a concept you don’t understand.
12. Earning good marks in most courses.
13. Studying enough to understand content thoroughly.
15. Participating in extracurricular events (sports, clubs).
17. Attending class regularly.
18. Attending class consistently in a dull course.
19. Making a professor think you’re paying attention in class.
20. Understanding most ideas you read in your texts.
21. Understanding most ideas presented in class.
22. Performing simple math computations.
23. Using a computer.
24. Mastering most content in a math course.
25. Talking to a professor privately to get to know him or her.
26. Relating course content to material in other courses.
27. Challenging a professor’s opinion in class.
28. Applying lecture content to a laboratory session.
29. Making good use of the library.
30. Getting good grades.
31. Spreading out studying instead of cramming.
32. Understanding difficult passages in textbooks.
33. Mastering content in a course you're not interested in.

Thanks for your help!
APPENDIX D

Self-Efficacy Scale (General and Social scales)

Instructions: This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or feeling. Please be very truthful and describe yourself as you really are, not as you would like to be.

Mark: A If you Disagree Strongly with the statement
B If you Disagree Moderately with the statement
C If you Neither Agree nor Disagree with the statement
D If you Agree Moderately with the statement
E If you Agree Strongly with the statement

1. I like to grow house plants.
   A B C D E

2. When I make plans, I am certain I can make them work.
   A B C D E

3. One of my problems is that I cannot get down to work when I should.
   A B C D E

4. If I can’t do a job the first time, I keep trying until I can.
   A B C D E

5. Heredity plays the major role in determining one’s personality.
   A B C D E

6. It is difficult for me to make new friends.
   A B C D E

7. When I set important goals for myself, I rarely achieve them.
   A B C D E

8. I give up on things before completing them.
   A B C D E

9. I like to cook.
   A B C D E
10. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.
A B C D E

11. I avoid facing difficulties.
A B C D E

12. If something looks too complicated, I will not even bother to try it.
A B C D E

13. There is some good in everybody.
A B C D E

14. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to makes friends with that person.
A B C D E

15. When I have something unpleasant to do, I stick with it until I finish it.
A B C D E

16. When I decide to do something, I go right to work on it.
A B C D E

17. I like science.
A B C D E

18. When trying to learn something new, I soon give up if I am not initially successful.
A B C D E

19. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.
A B C D E

20. When unexpected problems occur, I don't handle them well.
A B C D E

21. If I were an artist, I would like to draw children.
A B C D E

22. I avoid trying to learn new things when they look too difficult to me.
A B C D E
23. Failure just makes me try harder.
A B C D E

24. I do not handle myself well in social gatherings.
A B C D E

25. I very much like to ride horses.
A B C D E

26. I feel insecure about my ability to do things.
A B C D E

27. I am a self-reliant person.
A B C D E

28. I have acquired my friends through my personal abilities at making friends.
A B C D E

29. I give up easily.
A B C D E

30. I do not seem capable of dealing with most problems that come up in my life.
A B C D E
APPENDIX E

COLLEGE ATTITUDE SURVEY
(Academic Self-Concept)

Listed below are a number of statements concerning school-related attitudes. Rate each item as it pertains to you personally. Base your ratings on how you feel most of the time. Use the following scale to rate each statement:

SD. Strongly Disagree D. Disagree A. Agree SA. Strongly Agree

INDICATE YOUR RESPONSE BY CIRCLING THE APPROPRIATE LETTER(S). Be sure to answer all items. Please respond to each item independently, do not be influenced by your previous choices.

1. Being a student is a very rewarding experience. SO D A SA
2. If I try hard enough, I will be able to get good grades. SD D A SA
3. Most of the time my efforts in school are rewarded. SD D A SA
4. No matter how hard I try I do not do well in school. SO D A SA
5. I often expect to do poorly on exams. SD D A SA
6. All in all, I feel I am a capable student. SD D A SA
7. I do well in my courses given the amount of time I dedicate to studying. SD D A SA
8. My parents are not satisfied with my grades in college. SD D A SA
9. Others view me as intelligent. SD D A SA
10. Most courses are very easy for me. SD D A SA
11. I sometimes feel like dropping out of school. SD D A SA
12. Most of my classmates do better in school than I do. SD D A SA
13. Most of my instructors think that I am a good student. SD D A SA
14. At times I feel college is too difficult for me. SD D A SA
15. All in all, I am proud of my grades in college. SD D A SA
16. Most of the time while taking a test I feel confident. SD D A SA
17. I feel capable of helping others with their class work. SD D A SA
18. I feel teachers' standards are too high for me. SD D A SA
19. It is hard for me to keep up with my class work. SD D A SA
20. I am satisfied with the class assignments that I turn in. SD D A SA
21. At times I feel like a failure. SD D A SA
22. I feel I do not study enough before a test. SD D A SA
23. Most exams are easy for me. SD D A SA
24. I have doubts that I will do well in my major. SD D A SA
25. For me, studying hard pays off. SD D A SA
26. I have a hard time getting through school. SD D A SA
27. I am good at scheduling my study time. SD D A SA
28. I have a fairly clear sense of my academic goals. SD D A SA
29. I'd like to be a much better student than I am now. SD D A SA
30. I often get discouraged about school. SD D A SA
31. I enjoy doing my homework. SD D A SA
32. I consider myself a very good student. SD D A SA
33. I usually get the grades I deserve in my courses. SD D A SA
34. I do not study as much as I should. SD D A SA
35. I usually feel on top of my work by finals week. SD D A SA
36. Others consider me a good student. SD D A SA
37. I feel that I am better than the average college student. SD D A SA
38. In most of the courses, I feel that my classmates are better prepared than I am. SD D A SA
39. I feel that I do not have the necessary abilities for certain courses in my major. SD D A SA
40. I have poor study habits. SD D A SA
### APPENDIX F

Descriptive Statistics

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Note: The mean age of participants is 20.5 years. There are more female than male participants and more of them arrived at the university as freshmen than with other class standing. Currently, the bulk of participants are sophomores and juniors. Of those participants who transferred in, most came from a community or junior college and about half of the transfer student subgroup came with an associate’s degree. Less than half of participants have changed their major and/or minor. Most participants report Caucasian ethnicity, although a wide array of ethnicities is represented among participants. Lastly, the mean reported GPA (3.07) was .03 higher than the mean actual GPA (3.04).
## APPENDIX G
ANOVA’s for Demographic Information

### ANOVA: IV=gender, DV=measure

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### ANOVA: IV=class standing, DV=measure

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### ANOVA: IV=Background at entrance to university, DV=measure

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### ANOVA: IV=origin of transfer (if transfer student), DV=measure

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### ANOVA: DV=transfer standing at matriculation to university, DV=measure

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| SUMSESSocial   |        |             |      |      |
| Between Groups | 44.182 | 1           | 44.182| 7.364| .024 |
| Within Groups  | 54.000 | 9           | 6.000|     |      |
| Total          | 98.182 | 10          |      |      |

| SUMSESGeneral  |        |             |      |      |
| Between Groups | 89.376 | 1           | 89.376| 2.776| .134 |
| Within Groups  | 257.524| 8           | 32.190|     |      |
| Total          | 346.900| 9           |      |      |

| SUMOFCASES     |        |             |      |      |
| Between Groups | 432.742| 1           | 432.742| 1.732| .221 |
| Within Groups  | 2248.167| 9           | 249.796|     |      |
| Total          | 2680.909| 10          |      |      |

### ANOVA: DV=participants who changed major/minor, DV=measure

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| SUMSESSocial   |        |             |      |      |
| Between Groups | .069   | 1           | .069| .005 | .944 |
| Within Groups  | 1083.121| 77         | 14.067|     |      |
| Total          | 1083.190| 78         |      |      |

| SUMSESGeneral  |        |             |      |      |
| Between Groups | 88.929 | 1           | 88.929| 1.384| .243 |
| Within Groups  | 4755.952| 74        | 64.270|     |      |
| Total          | 4844.882| 75        |      |      |

| SUMOFCASES     |        |             |      |      |
| Between Groups | 41.941 | 1           | 41.941| .208 | .650 |
| Within Groups  | 14521.572| 72      | 201.689|     |      |
| Total          | 14563.514| 73      |      |      |