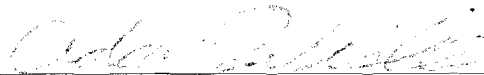


MOTIVATIONAL AND SELF-REGULATORY PREDICTORS OF ACADEMIC
RETENTION AND GRADUATION IN FIRST-YEAR COLLEGE STUDENTS

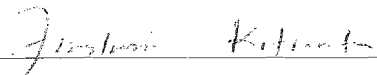
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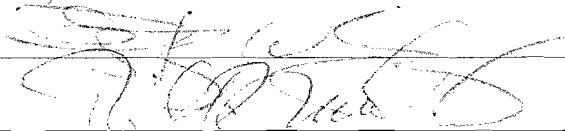
William Deutsch
A Thesis
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Master of Arts
Psychology

Committee:




Director

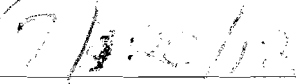




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Summer Semester 2012
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Motivational and Self-Regulatory Predictors of Academic Retention and Graduation in
First-Year College Students

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Arts at George Mason University

by

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Bachelor of Arts
George Mason University, 2010

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Summer Semester 2012
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Abstract

MOTIVATIONAL AND SELF-REGULATORY PREDICTORS OF ACADEMIC RETENTION AND GRADUATION IN FIRST-YEAR COLLEGE STUDENTS

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George Mason University, 2012

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High rates of college dropout are an ever-growing concern for educators and students alike. The most widely used predictors of college achievement, which heavily influence retention, are prior ability measurements, such as students' high school grade point average and SAT scores. It is possible that other, less commonly examined, variables exist that better explain retention. Survey data were collected from 589 first-year college students to examine predictors of 4-, 5- and 7- year college retention and graduation rates. Variables included the use of learning strategies, aspects of motivation (task value, self efficacy, test anxiety), adherence to goal orientation (mastery, performance approach, performance avoidance), prior achievement measures (high school GPA and SAT scores), first-semester college GPA, and demographic variables (gender, race, on-campus living situation). Students completed the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1993) and the Patterns of Adaptive Learning Scales (PALS;

Midgley et al., 1998). Results of multiple hierarchical logistic regressions indicated that the strongest predictors of college graduation include race, high school GPA, having a mastery goal orientation, and first-semester college GPA. Implications for high stakes college admissions decisions are discussed.

Introduction

In 2009, the *New York Times* ran a story detailing the high rate of college dropout that exists in the United States (Leonhardt, 2009), and stated that among wealthy nations, the United States ranks second (behind Italy) in college dropout rates, with one source estimating a 39.4% dropout rate amongst full-time college students (*Time is the enemy summary*, 2011). Assuming that these universities want students to graduate, something must be going on within American college students that leads to such high levels of dropout, or in other words, low levels of college *retention*. Retention is defined as continued enrollment in school until a degree is achieved. Each year, university admissions offices make high-stakes decisions about who they will admit to their schools, and their hope is that these students will go on to graduate with a degree. The most common criteria used for college admission is a student's high school grade point average (GPA) and Scholastic Aptitude Test (SAT) scores, which have been shown to be among the best predictors of college retention (DeBerard, Spielmans, & Julka, 2004; Robbins et al., 2004). This being said, these two predictors combined only account for about 22% of the variance in college retention, leaving much variance unaccounted for (Zwick & Sklar, 2005). The present study aims to explain more of the variance in college retention and graduation by examining variables related to the use of learning strategies and academic self-regulation, motivation (task value, self-efficacy, and test anxiety), goal

orientation, prior-ability, as well as demographic/context variables (such as gender, race, and living on or off campus).

The Big Picture

Ford (1992) proposes that achievement or competence in any domain is based on three constructs; motivation, skill, and presence of a responsive environment. He suggests that if any of these components are missing or inadequate, achievement and competence will be limited. This idea can be looked at specifically in the context of the undergraduate college experience. Ford states that motivation is necessary in order to initiate and maintain an activity. In college, this would translate to students needing motivation not only to apply to college, but also once they are there, they need this continued motivation in order to succeed. Motivation is broken down into three components; task value, self efficacy, and affect, all which are later discussed in detail. Ford goes on to suggest that a person must have the appropriate skill needed in order to accomplish the goal a person is trying to achieve. These skills do not directly include aspects of motivation. In college, students need the appropriate learning and studying skills in order to achieve their presumed goal of graduating with a degree. In the present thesis, these skills are examined via prior achievement (high school GPA and SAT scores), as well as the actual strategies for learning students used throughout their time in college. Finally, Ford suggests that a person needs to be in the presence of a responsive environment that facilitates progress toward their goal. Colleges are typically thought to be responsive environments that facilitate students' learning, therefore students' living

environment is examined to see if it affects students' likelihood of graduating with a degree.

What constitutes success in college? Researchers vary in how college outcomes are conceptualized. Most studies examine predictors of college achievement, measured by GPA. Examining predictors of achievement, as measured by GPA as opposed to retention itself, is useful as GPA has been found to be among the strongest predictors of college retention, and therefore graduation (DeBerard et al., 2004; Kiser & Price, 2007; Robbins et al., 2004). Conceptualizing achievement in terms of retention is also important because Robbins et al. (2004) mentions that at the time of his meta-analysis, only five studies examined the association between their predictors and time taken to receive a degree, which is done in the present study. Although achievement is used as an outcome in most studies, there are still several studies that examined the present predictors used, and the effect they have on retention (DeBerard et al., 2004; Murtaugh, Burns, & Schuster, 1999; Robbins et al., 2004).

Learning Strategies and Academic Self-Regulation

As mentioned, a person needs to have an appropriate amount of skill in order to succeed at accomplishing a goal. In college, these skills can be assessed by examining different learning strategies that students choose to use. Learning strategies are defined as the behaviors or thoughts that a student engages in during learning that affects his/her encoding, storage, organization, and retrieval of knowledge (Pintrich & de Groot, 1990). Learning strategies exist at two levels; *cognitive strategies* as well as *metacognitive strategies*. Cognitive learning strategies are characterized as thoughts or behaviors that

help individuals reach a particular goal, such as doing well on a test. These behaviors include elaboration (paraphrasing and summarization), organization (outlining), and rehearsal (continuous repetition of facts). Research suggests that active engagement in learning strategies, such as with elaboration and organization, leads to better academic outcomes, as measured by GPA, than passive learning behaviors, such as rehearsal (Ford, Smith, Weissbein, Gully, & Salas, 1998). Also, in a meta analysis, academic related skills were found to be among the strongest predictors of college retention until graduation (Robbins et al., 2004).

Metacognitive learning strategies are used to regulate the cognitive learning activities previously discussed and ensure that goals are met (Ford et al., 1998). Pintrich, Smith, Garcia, and McKeachie (1993) characterize metacognitive learning strategies based on three processes; planning (setting goals), monitoring (looking at one's comprehension), and regulating (adjusting based on monitoring). Metacognition is closely tied to academic performance in college, with those using more metacognitive strategies achieving higher than those who do not (Kornell & Metcalfe, 2006).

Metacognitive learning strategies fall into the domain of *Academic Self-Regulation* along with other constructs such as students' time management and utilization of appropriate study environments. Effort regulation, which is continuing to work on tasks although they may be difficult or boring, is another important aspect of academic self-regulation (Pintrich et al., 1993). Overall, researchers suggest that all aspects of academic self-regulation are associated with academic success in college, and are

therefore potentially useful predictors of retention and graduation (Johnson, 1997; Pintrich et al., 1993; Robbins et al., 2004).

Motivation

Motivation is a difficult concept to define, and definitions vary in the literature. Ford (1992) defines motivation as “The organized patterning of an individual’s personal goals, emotions, and personal agency beliefs” (Ford, 1992, p. 78). As Ford elaborates on motivation, he posits that motivational processes lie within the qualities of an individual, as opposed to the context in which the individual resides. Ford (1992) goes on to discuss the idea that motivational processes are future-oriented, and those other psychological processes focusing on past or current events should not be considered when discussing motivation. He would categorize these processes as “skill-related processes,” such as the learning strategies previously discussed. Ford distinguishes between motivational processes and skill-related process even further by positing that motivational processes are evaluative, and help the individual to identify and “size up” a problem or opportunity, but they don’t actually solve anything. That is the role of skill-related processes. In order to be successful in a given situation, high levels of skill-related processes and motivational processes should be present.

In contrast with Ford’s (2002) conceptualization of motivation, Wigfield and Eccles (2000) characterize motivation as context specific based on three different constructs; task value, self-efficacy, and affect. These aspects of motivation will be discussed further, and tested in the present study to look for associations with college retention and graduation.

Task value. According to Wigfield and Eccles (2000), task value consists of four subcategories; attainment value, interest value, utility value, and cost. The first three components of task value are relevant to the current study. Eccles (2005) defines *attainment value* as the perceived importance of participating or doing well on a given task, *interest value* as the enjoyment one feels from doing a given task, and *utility value* as how useful a given task is for a person's future goals. As an example, if a student has enjoyed doing math from a young age (interest value), feels it is important to do well in math (attainment value), and strives to become an engineer (utility value), this person would be identified as having high task value in the domain of mathematics. It should be noted here that task value is context specific (Eccles, 2005), and the student from the example may not hold a high task value for English, or other subjects.

One study (Meece, Wigfield, & Eccles, 1990) finds that the best predictor of students' intentions to continue learning math was the importance (or task value) of the subject to the student. From a more global perspective, the task value a student holds for college in general should be predictive of how long they plan to stay enrolled at a given university. Another study (Pintrich & de Groot, 1990) reports that high task value is strongly related to a student's use of cognitive strategies and self-regulation. The researchers goes on to state that those students who hold high task values for given subjects were more motivated to learn the material, and not just receive good grades.

Self-efficacy. Self-efficacy can be defined as a person's evaluation of whether or not he/she has the skills needed to accomplish a particular goal under certain conditions (Ford, 1992, p. 116). In an academic setting, academic self-efficacy refers to a student's

belief concerning their ability to perform at different academic tasks (Bong, 2001). For example, if a student believes that he will do well in a given course, he is said to have a high level of self-efficacy. Similar to task value, self-efficacy is context specific (Bong, 2001), meaning that a person does not necessarily have high levels of self-efficacy across various domains (or classes, in the case of academic self-efficacy) just because he is self-efficacious in one domain. The present study uses a more global measurement of self-efficacy and assesses the degree to which students believe they have the ability to succeed in undergraduate coursework in general, not the beliefs they hold for each particular course.

High levels of self-efficacy have been associated with greater levels of academic achievement (Bong, 2001; Ford, 1992; Kitsantas, Winsler, & Huie, 2008; Pintrich & de Groot, 1990; Wigfield & Eccles, 2000) and retention (Robbins et al., 2004). Bong (2001) finds that students with higher self-efficacy are more willing to engage in challenging tasks, invest greater effort and persistence in their studies, and achieve higher GPAs compared to those who lack a strong sense of self-efficacy. Bong (2001) also reports that self-efficacy is positively correlated with task value. Pintrich and de Groot (1990) report that higher levels of self-efficacy are correlated with higher levels of cognitive strategy use and self-regulation, which then lead to increased levels of student achievement. To add to these findings regarding the importance of self-efficacy, a meta-analysis conducted by Robbins et al. (2004) reports that academic self-efficacy is among the best predictors of college GPA and retention, aside from the more traditional predictors of high school GPA and SAT scores. Other comparison predictors included academic goals,

institutional commitment, social support, social involvement, academic learning strategies, financial support, and institutional selectivity. The present study will use and expand upon this literature in examining if self-efficacy is indeed among the best predictors of college retention and how it compares with other predictors mentioned in order to accurately predict retention.

Affect. Test anxiety is an important affective component that influences student motivation. Test anxiety can be defined as “the set of phenomenological, physiological, and behavioral responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation” (Zeidner, 1998, p. 17). The literature overwhelmingly supports the idea that those with high test anxiety are more prone to poorer academic performance (Chapell et al., 2005; Elliot & McGregor, 1999; Hembree, 1988; Hong & Karstenson, 2002; Seipp, 1991). In a study conducted with undergraduate and graduate students, Chapell et al. (2005) reported that those students with high levels of test anxiety scored on average 1/3 of a letter grade lower than their peers who did not suffer from test anxiety. Also reported in this study is the fact that females tend to have significantly higher levels of test anxiety compared to males, which has been found in other studies as well (Hong & Karstenson, 2002). Elliot and McGregor (1999) looked at the effect test anxiety has on goal orientation (discussed below). The researchers report that worry (a component of test anxiety) was found to be a mediator of the negative relationship between performance-avoidance goals and exam performance. Those who subscribed to a performance-approach goal orientation style were characterized by higher levels of exam performance, regardless of test anxiety.

Goal Orientation

Although different researchers characterize goal orientations in various ways (Ford, 1992), there are essentially three types of goal orientations; mastery orientation, performance-approach orientation, and performance-avoidance orientation (Midgley et al., 1998; Muis, Winne, & Edwards, 2009; Pintrich & de Groot, 1990). In a learning environment, these three types of goal orientations have unique associations with achievement and the use of cognitive learning strategies.

Mastery goal orientation. Midgley et al. (1998) conceptualize those with high levels of mastery goal orientation as individuals who strive to increase their skill and understanding in some domain. These individuals define success in relation to the task, and measure progress in self-referential terms. These students do not study so that they will receive high grades on exams; rather they study to gain a better understanding of the course material. High levels of mastery goal orientation has been associated with high levels of self-efficacy (Elliot & Church, 1997; Pintrich & de Groot, 1990; Wolters, Yu, & Pintrich, 1996) as well as increased use of adaptive learning strategies (Kaplan & Midgley, 1997; Middleton & Midgley, 1997; Midgley et al., 1998; Muis et al., 2009), which have both have been associated with increased academic achievement and retention in college (Kitsantas et al., 2008; Robbins et al., 2004). The adaptive learning strategies mentioned include self-regulated learning, meta-cognitive strategies, as well as help-seeking behaviors.

Performance-approach goal orientation. Performance-approach goal orientation is characterized by a learner striving to demonstrate aptitude and seek

favorable judgments from others. Those with high levels of performance-approach goal orientation define their success in relation to others (Muis et al., 2009). These are the students who study what they know will be on the test, and attend college to earn grades and a degree in order to demonstrate their knowledge to others. Unlike mastery goal orientation, which the literature overwhelmingly associates with positive academic outcomes, studies vary on outcomes associated with performance-approach orientation. Some researchers find associations between performance-approach orientation and increased performance (Bouffard, Vezeau, & Bordeleau, 1998), and others do not (Wolters et al., 1996).

Elliot and Church (1997) report that higher levels of performance-approach goal orientation are linked to both achievement motivation, as well as fear of failure. Similar to this finding, Midgley et al. (1998) report that performance-approach goal orientation is sometimes associated negatively with academic self-efficacy, and sometimes is associated positively. This same finding is reported by Muis et al. (2009). Finally, Middleton and Midgley (1997) report no associations between performance-approach goal orientation and self regulated learning.

Performance-avoidance goal orientation. Those with high levels of performance-avoidance goal orientation are characterized by striving to avoid demonstrations of incompetency (Muis et al., 2009). Similar to performance-approach goal orientation, success is defined in relation to others. Elliot and Church (1997), who examined predictors of those who subscribe to a performance-avoidance goal orientation, report that low-levels of self-efficacy is one of the strongest predictors for those with high

levels of this goal orientation. Of the three goal orientations discussed, high performance-avoidance orientation is associated with the poorest outcomes for students. Researchers (Anderman & Young, 1994; Elliot & McGregor, 1999) report that those with high levels of this goal orientation tend to use less deep-level processing strategies, such as meta-cognition, and more surface-level processing strategies, such as rehearsal. This could be a possible explanation as to why performance-avoidance goal orientation has been found to be negatively associated with achievement (Elliot & McGregor, 1999).

Prior Ability

The literature overwhelmingly supports the idea that prior ability (as measured by cumulative high school GPA and SAT scores) is significantly associated with collegiate academic performance and retention (DeBerard et al., 2004; McGrath & Braunstein, 1997; Murtaugh et al., 1999; Robbins, Allen, Casillas, Peterson, & Le, 2006; Stumpf & Stanley, 2002; Zwick & Sklar, 2005). Zwick and Sklar (2005) report that 22% of the variance in graduation rates can be attributed to high school GPA and SAT scores. In that study, high school GPA ($b=.38$) was a better predictor of graduation than combined SAT score ($b=.15$). Murtaugh et al. (1999) report that for four-year retention (graduation) probabilities, those with high school GPAs less than 2.0 had about an 18% chance of graduating college, those with a GPA between 2.0-2.7 had about a 35% chance of graduating college, those with a GPA between 2.7-3.3 had about a 50% chance of graduating college, and those with a high school GPAs between 3.3-4.0 had about a 69% chance of graduating college. Similar to the Zwick and Sklar (2005) study, Murtaugh et al. (1999) find significant associations between combined SAT score and college

completion, and, again, these associations were weaker when compared to the associations between cumulative high school GPA and college completion.

Demographics/Background information

Gender . There is debate in the literature regarding the role of gender in college retention. Galicki and McEwen (1989) as well as Johnson (1997) report that females graduate at a higher rate than males. Contradictory to this finding, several researchers (McGrath & Braunstein, 1997; Murtaugh, Burns, & Schuster, 1999; Ryland, Riordan, & Brack, 1994) report no significant difference between males and females when examining graduation rates. The different findings in these studies may be due to varying sample sizes, but in all cases, the effect of gender was not very large. The present study will contribute to the current literature regarding the role of gender in college retention rates and will examine if there are gender differences not just in overall graduation rates, but also in the time taken to earn a degree.

Race. Murtaugh et al. (1999) report significant differences in graduation rates based on race. The researchers reported that rates of graduation were significantly higher for White and Asian students compared to Black and Hispanic students. Similar to the gender variable, there are inconsistent findings in the literature with several studies finding no associations between race and college retention (DeBerard et al., 2004; McGrath & Braunstein, 1997). It is possible that significant differences in rates of retention were found in the Murtaugh et al. (1999) study and not the others due the size of their sample ($n=8,867$). The present study will contribute to the current literature

regarding the role of race not only in predicting college overall graduation, but also how race affects how long students take to graduate with a degree.

Housing. One key aspect that influences academic self-regulation and ultimately retention is a student's environment. Early college students, for the most part, have the option of living on campus with peers, or off campus with their families. Research supports the idea that those who are not socially integrated and invested in their campus risk higher rates of dropout than those who are socially invested in their school (Johnson, 1997; Robbins et al., 2004; Stage, 1989). Students who live on campus tend to be more socially invested in their schools than those who live off campus (Johnson, 1997). By living on campus, students have more access to the resources they need to academically succeed (Inman & Pascarella, 1998), such as libraries, peer networks, and access to professors should they need help. Although on-campus living environments more aptly supply the student with the resources he needs, living on campus may also introduce the student to a party culture littered with drugs and alcohol which may have negative social and academic consequences for the student (McGaha & Fitzpatrick, 2005), which may ultimately affect retention and eventual graduation.

Turley and Wodtke (2010) report that for most students in most institutions, type of residence does not have a significant effect on college GPA. This being said, the researchers report that Black students who live on campus have significantly higher GPAs than Black students who do not, suggesting that perhaps the relationship between residency and academic achievement is influenced by other variables. The present study

will examine differences in college graduation rates based on early residency status, and also if residency status effects how long students take to eventually earn their degree.

Summary

The literature supports the idea that predictors of college retention and graduation may exist outside of the more commonly examined high school GPA and SAT scores. These predictors, which include the use of cognitive learning strategies, motivation, and goal orientation, have been shown to influence both college achievement and retention above and beyond that of the more traditional predictors. The literature also supports the idea that predictor variables interact with one another; that is to say that those with certain goal orientations use different cognitive learning strategies which ultimately affects achievement and therefore retention.

The present study, which uses prospective data collected over seven years, will expand upon the current literature in that it will examine the use of specific learning strategies, demographic variables, prior ability measurements, and attitudes about academic motivation and goal orientation in order to predict who will stay in school, and how long it takes these students to graduate.

Research Questions

1. Are demographic variables, such as gender, ethnicity, and living environment associated with college graduation rates after four, five, and seven years?
2. Are prior achievement measurements (High school GPA and SAT scores) associated with college graduation within four, five, and seven years? Do they explain more variance in predicting graduation than just demographic variables?
3. Are aspects of motivation (task value, self-efficacy, test anxiety) and goal orientation (mastery, performance approach, performance avoidance) useful predictors of college graduation? Does adding these variables to the model aid in predicting graduation within four, five, and seven years?
4. Are cognitive learning strategies and self-regulation associated with graduating within four, five, and seven years? Does adding these variables to the model help predict graduation?
5. Is there an association between college GPA for a students' first semester of school and graduation within four, five, and seven years? Does adding this variable to the model better predict graduation compared to previous models?
6. For students who eventually graduate, are predictors associated with the number of semesters taken until graduation?

Method

Participants

Data were initially collected for 589 participants (38% male) from a large Mid-Atlantic public university. At time point one (T1), which was at the beginning of students' first college semester, participants were recruited for the study in introductory undergraduate courses which were typically taken by first-semester students. Examples of these courses included Communications 100, Psychology 100, University 100, and Biology 103. Students in some of the courses received a small amount of extra credit in exchange for their participation in the study.

Within the original sample, the mean age was 18.9 years ($SD=1.89$). Sixty-five percent of participants were Caucasian, 7% African-American, 7% Hispanic, 18% Asian-American, 1% Middle Eastern and 2% other. Sixty-one percent of students lived on campus. As far as residency, 61% of the initial sample was from Northern Virginia, 19% from other areas of Virginia, 17% from out of state, and 4% were international students. Seventy-nine percent of the sample reported English as being their native language. Finally, about 8% of the initial sample consisted of transfer students, although it was their first semester at this particular university.

The average math SAT score was 546 ($SD=76$) and the average verbal SAT score was 530 ($SD=82$). The average high school cumulative GPA was 3.27 ($SD=.37$).

Measures

Demographics. Basic background information, such as age, gender, ethnicity, and parental education was collected from participants via introductory questions on the survey.

Prior ability, GPA, graduation, and retention. Participants' high school GPA, SAT scores (both Math and Verbal), semester-by-semester college enrollment status and GPA, and year of college graduation were obtained from university records with student and IRB consent. Data exists for students up to seven years after the study began.

Several new variables were created. The first three variables, *Graduated in 4 years*, *Graduated in 5 years*, and *Graduated in 7 years* denote if students graduated within those given years. For example, all of those students who graduated within four years were given a code of "1" for *Graduated in 4 years*, and those who did not graduate within four years (including those who dropped out) were coded as "0." A similar pattern was used when coding for *Graduated in 5 years*. Those who graduated within five years (including all of those who graduated in four) were coded as "1," and those who did not graduate within five years, or dropped out, were coded as "0." The same coding pattern was used for the *Graduated in 7 years* variable, with those ever having a graduation record in the data set being coded as "1" and those who never had a graduation record in the data set coded as "0.". Students who were still enrolled but not graduated from GMU yet after 7 years ($n = 4$) were coded as a '0'.

In addition to the graduation variables, two retention variables, *Retained after 4 years* and *Retained after 5 years* were created. For the *Retained after 4 years* variable, all

those who graduated within four years or were still enrolled in after the four-year time point were coded as retained (“1.”) If students dropped out prior to this four-year time point and were not enrolled at this four year time point, they were coded as “0.” The same pattern was used for the *Retained after 5 years* variable. All students who graduated within five years, or were still enrolled in a after the five-year time point were coded as “1.” If students dropped out prior to this five-year time point and did not graduate by this five-year time point, they were coded as “0.” A retention after seven years variable was not created because this variable would have looked identical to the *Graduated in 7 years* variable as data was not available after that point to see if students continued to be enrolled.

In order to examine differences and associations with time taken until graduation, the variable *Time taken until graduation* was created. This variable denoted the number of semesters it took students to graduate, including summer semesters. Therefore, if a student graduated in the spring of their fourth year, they graduated in 11 semesters. Students who did not graduate were treated as missing data.

Motivated Strategies for Learning Questionnaire. The Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1993) is a widely used (Lin, McKeachie, & Kim, 2001; Pekrun, Goetz, Titz, & Perry, 2002), and well validated self-report measure that assesses different constructs of student motivation and learning using a 7-point Likert scale (1= *Not at all true of me* and 7= *Very true of me*). The MSLQ is made up of two scales; the first assesses students’ motivation on six subscales ($K=31$;

$a=.86$) and the second assesses students' learning strategies on nine subscales ($K=50$; $a=.90$).

For this study, the *Elaborating* ($K=6$; $a=.71$), *Organizing* ($K=4$; $a=.68$), *Rehearsing* ($K=4$; $a=.67$), and *Critical Thinking* ($K=5$; $a=.75$) subscales were combined in order to gauge students' use of cognitive learning strategies. These variables were summed in order to create one *Cognitive Strategies* variable ($K=19$; $a=.87$). Questions from this combined scale included "When I study the readings for a course, I outline the material to help me organize my thoughts," as well as "When I study for a class, I practice saying the material to myself over and over." The *Self-Regulation* subscale ($K=12$; $a=.76$) was used to assess students' metacognitive learning strategies. A question asked on this scale was "If course readings are difficult to understand, I change the way I read the material." The *Task Value* ($K=6$; $a=.78$), and *Test Anxiety* ($K=5$; $a=.75$) subscales were used in order to better assess participants' motivational beliefs regarding college. An item from the Task Value subscale was "I think I will be able to use what I learn in one course in other courses" and an item from the Test Anxiety subscale was "When I take a test I think about how poorly I am doing compared with other students."

It should be noted that the MSLQ was originally designed in order to address motivation and self-regulation in a specific domain and context, such as in one particular class. Because of this, the wording of the items was slightly modified so that students were responding to questions related to general academic tasks as opposed to some specific domain. For example, scale items containing the phrase "in this class" were changed instead to contain the phrase "in my classes."

Patterns of Adaptive Learning Scales. The Patterns of Adaptive Learning Scales (PALS; Midgley et al., 1998) is a widely used, self-report measure that assesses students' goal orientation, as well as students' levels of self-efficacy and academic self-handicapping. These constructs are assessed using a 5-point Likert scale (1= *Not at all true of you* and 5= *Very true of you*). The measure contains 51 items broken down into subscales. The subscales used were: *Academic Self-Efficacy* ($K=5$; $a=.75$), *Mastery Goal Orientation* ($K=5$; $a=.87$), *Performance Approach Goal Orientation* ($K=5$; $a=.70$) and *Performance Avoid Goal Orientation* ($K=4$; $a=.75$). Sample items from each subscale included: Academic Self-Efficacy- "I'm certain I can master the skills taught in class this year"; Mastery- "It's important to me that I learn a lot of new concepts this year"; Performance Approach- "It's important to me that other students in my class think I am good at my class work"; and Performance Avoid- "One of my goals in class is to avoid looking like I have trouble doing the work."

Procedure

Questionnaires were initially handed out in introductory undergraduate courses which are typically taken by first-semester students. The survey was administered within the first two to three weeks of students' first semester (Fall) in college ($n=589$). The survey was administered in the class in which the students were recruited. Surveys were taken home by the student, and then returned to the researcher the following class.

Results

The strategy used for data analysis was to first examine univariate differences in all predictor variables based on several dichotomous outcomes. The outcomes used, which were the comparison groups for the univariate analyses, were the newly created *Graduated in 4 years*, *Graduated in 5 years*, *Graduated in 7 years* variables, as well as the *Retained after 4 years* and *Retained after 5 years variables*. After univariate analyses were conducted, I added multiple predictors together and used three hierarchical logistic regression models with the three graduation variables as the dependent outcome variables in turn.

Univariate Analyses

Overall, 31% of students graduated within four years, 47% graduated within five years, and 62% graduated within seven years. Looking at graduation/retention rates, 70% of students graduated or were retained after four years, meaning 30% dropped out within 4 years. After five years, the retention percentage dropped to 67%, still being enrolled (or having graduated by then) and then dropped even further to 62% when looking at seven-year outcomes.

Chi-square analyses were used to look for differences in categorical variables (gender, race, living situation) based on whether students graduated in four, five, and seven years as well if they graduated or were retained in four or five years. For all five

outcomes, for all three variables, Chi-square analyses did not yield significant results.

See Table 1 for percentages.

For continuous variables (high school GPA, SAT score, task value, self efficacy, test anxiety, mastery goal orientation, performance approach goal orientation, performance avoidance goal orientation, cognitive strategies, self regulation, and first-semester GPA), Independent Samples T-tests were conducted to see if there were mean differences between those who graduated (within four, five, and seven years) and those who did not (Table 1). Also, T-tests were conducted to see if there were mean differences in variables for those who graduated or were retained after four and five years and those who dropped out (Table 2).

Students who graduated within four years ($M=3.37$, $SD=.39$) had higher high school GPAs than those who did not ($M=3.19$, $SD=.37$), $t(567)=5.39$, $p < .01$. Similarly, students who graduated within five years ($M=3.32$, $SD=.38$) had higher high school GPAs than those who did not ($M=3.17$, $SD=.38$), $t(567)=4.84$, $p < .01$. Following this same trend, students who graduated within seven years ($M=3.31$, $SD=.39$) had higher high school GPAs than those who did not graduate ($M=3.15$, $SD=.37$), $t(562)=4.90$, $p < .01$. A very similar pattern emerged when looking at retention after four and five years with those graduating or being retained after four years having higher high school GPAs ($M=3.28$, $SD=.39$) than those who did not graduate or dropped out ($M=3.17$, $SD=.36$), $t(562)=3.21$, $p < .01$. For five year retention outcomes, again, those who were retained or graduated had higher GPAs ($M=3.29$, $SD=.40$) than those who did not ($M=3.16$, $SD=.35$), $t(562)=3.55$, $p < .01$. Differences in SAT scores were observed for four- and

five-year graduation outcomes, with those graduating within four years ($M=1101.56$, $SD=146.23$) having higher SAT scores than those who did not graduate within four years ($M=1065.49$, $SD=123.39$), $t(546)=3.00$, $p < .01$. Students who graduated within five years ($M=1087.37$, $SD=135.77$) had marginally higher SAT scores than those who did not ($M=1067.47$, $SD=127.96$), $t(546)=1.77$, $p = .08$. Significant differences in SAT scores were not observed between those graduating in seven years and those who did not, or in the retention comparisons.

For variables relating to motivation (task value, self efficacy, and test anxiety), mean differences were not observed for most comparisons. The only marginally significant difference that emerged was that those who graduated or were retained after five years ($M=4.08$, $SD=1.28$) had lower levels of test anxiety than those who dropped out ($M=4.27$, $SD=1.24$), $t(579)=1.64$, $p = .10$.

Differences in goal orientations emerged between those who graduated and those who did not, as well as those who were retained, and those who dropped out. For mastery goal orientation, those who graduated within five ($M=4.31$, $SD=0.71$) and seven years ($M=4.32$, $SD=0.70$) had higher averages than those who did not ($M=4.21$, $SD=0.71$; $M=4.14$, $SD=0.73$), $t(577)=1.78$, $p = .08$ and $t(571)=2.86$, $p < .01$, respectively. These same differences were found in both four and five year retention comparisons with those who were retained in four ($M=4.30$, $SD=0.71$) and five years ($M=4.31$, $SD=0.70$) having higher levels of Mastery Goal Orientation than those who dropped out at those same time points ($M=4.15$, $SD=0.72$; $M=4.14$, $SD=0.73$), $t(571)=2.25$, $p < .05$ and $t(571)=2.70$, $p < .01$, respectively. Only one comparison yielded marginally significant results when

examining performance approach goal orientation. Students who graduated in four years ($M=2.63$, $SD=1.08$) had marginally lower performance approach goals than those who did not graduate in four years ($M=2.81$, $SD=1.13$), $t(577)=1.84$, $p = .07$. No differences were observed in all comparisons for the performance avoidance goal orientation.

Only one marginal difference was observed in all comparisons for both the cognitive strategies and self regulation variables. Those who graduated in seven years ($M=4.42$, $SD=.85$) had marginally higher levels of self regulation compared to those who did not graduate in seven years ($M=4.31$, $SD=.82$), $t(577)=1.63$, $p = .10$.

First-semester college GPA was shown to have the largest differences between those who graduated and those who did not. Students who graduated within four ($M=3.03$, $SD=.61$), five ($M=2.92$, $SD=.66$), and seven ($M=2.87$, $SD=.69$) years had higher first-semester college GPAs than those who did not (graduated in 4 years: $M=2.56$, $SD=.85$, graduated in 5 years: $M=2.52$, $SD=.89$, graduated in 7 years: $M=2.44$, $SD=.93$), $t(559)=6.66$, $p < .01$, $t(559)=6.04$, $p < .01$, and $t(559)=6.30$, $p < .01$, respectively. The same pattern was observed for the retention variables with those having been retained (or graduated) after four ($M=2.79$, $SD=.72$) and five years ($M=2.81$, $SD=.71$) having higher first-semester college GPAs than those who dropped out ($M=2.51$, $SD=.97$; $M=2.49$, $SD=.95$), $t(559)=3.84$, $p < .01$, and $t(559)=4.58$, $p < .01$, respectively.

Correlational analyses were used to examine the association between continuous predictors and the number of semesters until graduation for those students who did eventually graduate. Results revealed that only high school GPA ($r = -.11$, $p < .05$) and first-semester college GPA ($r = -.16$, $p < .01$) were related to time until graduation. For

dichotomous variables, T-test analyses were conducted and suggested that there were no differences in time taken to graduate based on neither gender nor living on campus first semester. A one-way ANOVA was conducted to look for differences in time until graduation based on race ($F(4, 359) = 3.14, p < .05$). Results indicated that, on average, Black students graduated in the fewest number of semesters ($M = 12.95, SD = 3.42$) and that students classified as “Other” graduated in the most semesters ($M = 14.97, SD = 4.14$). These analyses included summer semesters. None of the individual contrasts were significant using a Bonferonni correction.

Multivariate Analyses

Three five-step logistic regression analyses were conducted in order to see which variables were useful in predicting college graduation in four (Table 3), five (Table 4), and seven (Table 5) years. In all three models, demographic predictors (gender, race, and living situation) were entered into step one, prior achievement measures (high school GPA and SAT scores) were entered into step two, aspects of motivation (task value, self efficacy, test anxiety, mastery goal orientation, performance approach goal orientation, performance avoidance goal orientation) were entered into step three, use of learning strategies (cognitive strategies and self regulation) were entered in step four, and first-semester college GPA was entered in step five.

Graduation in 4 Years. The first model (Table 3) was used to predict college graduation after four years. In step one (demographic predictors), the Block Chi Square was not significant ($\chi^2(6) = 6.73, p = .35$), and the Nagelkerke R^2 value was .02. None of the demographic predictors were significant in this step. Step two (prior achievement

predictors) yielded both a significant Block Chi Square ($\chi^2(2) = 29.63, p < .01$) and Model Chi Square ($\chi^2(8) = 36.35, p < .01$) values, with the Nagelkerke R^2 value in this step increasing to .10. As predicted, high school GPA proved to be a significant predictor of college graduation, $\chi^2(1) = 17.01, p < .01$, and yielded an *OR* of 3.27, meaning a 1-point increase in high-school GPA leads to 3.2 times greater odds of graduating in 4 years. In step three (motivation predictors), the Block Chi Square was not significant ($\chi^2(6) = 6.67, p = .35$), though the Model Chi Square was ($\chi^2(14) = 43.02, p < .01$). The Nagelkerke R^2 value in this step slightly three increased to .11. High School GPA remained significant, $\chi^2(1) = 17.30, p < .01$, with an *OR* of 3.37. In this step, SAT scores ($\chi^2(1) = 2.87, p = .09$) and task value ($\chi^2(1) = 2.70, p = .10$) emerged as a marginally significant predictors. Task value acted as a predictor in an opposite manner than was hypothesized, with less task value actually yielding positive changes in likelihood to graduate. In step four (learning strategy predictors), the Block Chi Square was not significant ($\chi^2(2) = 2.86, p = .24$), though the Model Chi Square still was ($\chi^2(16) = 45.88, p < .01$). Again, the Nagelkerke R^2 value in this step slightly increased to .12. The marginally significant predictors from step three lost significance, leaving only High School GPA ($\chi^2(1) = 16.83, OR = 3.32, p < .01$) as a significant predictor in the model. In step five (first-semester performance), both Block Chi Square ($\chi^2(1) = 23.11, p < .01$) and Model Chi Square ($\chi^2(17) = 68.99, p < .01$) were significant. The Nagelkerke R^2 value had a comparatively large increase in this step, finishing at .18. High school GPA remained a significant predictor, $\chi^2(1) = 6.5, OR = 2.19, p = .01$, and task value reemerged as a marginally significant predictor, $\chi^2(1) = 3.16, OR = .77, p = .07$. Again, task value,

which was hypothesized as being a positive predictor of graduation, ended up being a negative predictor, with each point increase on the task value measure actually predicting a 23% decreased likelihood of graduating in four years, holding all other predictors constant. Finally, First Semester College GPA, which was entered in step five, proved to be significant ($\chi^2(1) = 20.06$, $OR = 2.09$, $p < .01$), with each point increase in GPA doubling students' odds of graduating in four years.

Graduation in 5 Years. Model Two (Table 4) was used to predict college graduation within five years. Similar to Model One, step one did not yield a significant Block Chi Square ($\chi^2(6) = 9.10$, $p = .17$), and had an identical Nagelkerke R^2 value, .02. That being said, although race didn't emerge as a significant predictor of graduation ($\chi^2(4) = 6.03$, $p = .20$), the contrast with Blacks being at an advantage compared to Whites did emerge as significant ($\chi^2(1) = 4.36$, $OR = 2.31$, $p < .05$). In step two, both Block Chi Square ($\chi^2(2) = 20.30$, $p < .01$) and Model Chi Square ($\chi^2(8) = 29.39$, $p < .01$) values were significant. The Nagelkerke R^2 value in this step increased to .07, which is lower than it was in Model One. Race continued to be in the picture ($\chi^2(4) = 8.90$, $p = .06$), with being Black ($\chi^2(1) = 7.02$, $OR = 3.06$, $p < .01$) tripling students' odds of graduating in five years compared to Whites, holding all other predictors constant. Similar to Model One, high school GPA emerged as a significant predictor of graduation in five years, ($\chi^2(1) = 13.39$, $OR = 2.65$, $p < .01$), although the odds ratio was lower than in the first model. In step three, Block Chi Square ($\chi^2(6) = 5.40$, $p = .49$) was not significant and Model Chi Square was ($\chi^2(14) = 34.90$, $p < .01$). The Nagelkerke R^2 value in this step increased to .09, which, again, is lower than it was in Model One. Similar to the previous steps, Race,

($\chi^2(4) = 7.96, p = .09$), and more specifically, being Black ($\chi^2(1) = 6.46, p < .01$), increased students' odds of graduating by nearly three times, compared to White students. Similar to Model One, high school GPA remained a significant predictor in this step, $\chi^2(1) = 13.85, OR = 2.74, p < .01$. Although task value emerged as a marginally significant predictor in four year graduation outcomes, the same does not happen in this model, predicting five year outcomes. Instead, mastery goal orientation emerges as a significant predictor, $\chi^2(1) = 3.89, OR = 1.37, p < .05$. The Block Chi Square for step four was not significant ($\chi^2(2) = .24, p = .89$) and Model Chi Square was ($\chi^2(16) = 35.03, p < .01$). The Nagelkerke R^2 value in this step remained constant from step three, at .09. The predictors that were significant in step three remained significant in this step. The overall race predictor yielded $\chi^2(4) = 7.84, p = .10$, with being Black remaining a significant predictor of graduation, $\chi^2(1) = 6.34, OR = 2.92, p < .05$, compared to being White. High school GPA ($\chi^2(1) = 13.68, OR = 2.72, p < .01$) and mastery goal orientation ($\chi^2(1) = 3.78, OR = 1.37, p < .05$) remained significant as well, with learning strategies adding very little to the model. Both Block ($\chi^2(1) = 18.61, p < .01$) and Model ($\chi^2(17) = 53.64, p < .01$) Chi Square values were significant when adding first-semester college GPA in block five. The Nagelkerke R^2 value increased slightly to .13, which is lower than that of model one (.18). Race once again was around, $\chi^2(4) = 6.95, p = .14$, with being Black remaining a significant predictor of graduation, $\chi^2(1) = 6.23, OR = 2.93, p < .05$, compared to being White. Similar to the previous step, high school GPA remained significant, $\chi^2(1) = 5.49, OR = 1.95, p < .05$, though mastery goal orientation decreased in stature to a marginally significant predictor, $\chi^2(1) = 3.39, OR = 1.35, p = .07$.

Interestingly, task value, which was marginally significant in several steps of Model One, which predicted four year graduation outcomes, but has not been seen in this model, becomes marginally significant, $\chi^2(1) = 3.31$, $OR = .78$, $p = .07$, and again, task value predicted graduation likelihood in a manner opposite of what was hypothesized. In line with Model One, first-semester college GPA acted as a significant predictor in predicting graduation in five years, $\chi^2(1) = 17.13$, $OR = 1.76$, $p < .05$, although the odds ratio is slightly smaller.

Graduation in 7 Years. Model Three (Table 5) was used to predict college graduation within seven years. The first two steps in this model looked similar to the previous two models, which were predicting four year and five year graduation outcomes. Step one did not yield a significant Block Chi Square value ($\chi^2(6) = 7.48$, $p = .28$), and had a Nagelkerke R^2 value of .02. With the addition of prior achievement variables in step two, both the Block Chi Square ($\chi^2(2) = 19.66$, $p < .01$) and the Model Chi Square ($\chi^2(8) = 27.14$, $p < .01$) values were significant, and the Nagelkerke R^2 value increased to .07, which is lower than it was in Model One, but identical to that of Model Two. Unlike the previous two models, adding motivation and goal orientation variables in step three yielded a significant Block Chi Square, $\chi^2(6) = 14.44$, $p < .05$. The Model Chi Square for this step was $\chi^2(14) = 41.58$, $p < .01$, and the Nagelkerke R^2 value in this step increased to .11, which was the same value as Model One, and higher than the value in Model Two. Being Black remained a positive predictor of graduation ($\chi^2(1) = 6.23$, $p < .01$), with Black students graduating at 3.5 times the rate of white students in 7 years, holding all predictors constant. Similar to Model Two, mastery goal orientation emerged as a

significant predictor, $\chi^2(1) = 9.24$, $OR = 1.67$, $p < .01$. Mastery Goal Orientation had a higher odds ratio in this model than in Model Two. Similar to both previous models, High School GPA remained significant in this step, $\chi^2(1) = 13.86$, $OR = 2.87$, $p < .01$. Unlike the previous two models, performance avoidance goal orientation emerged as a significant predictor, though in the opposite direction than was hypothesized, $\chi^2(1) = 4.29$, $OR = 1.36$, $p < .05$. That is to say that for each point higher on the performance avoidance orientation scale, which denotes a stronger performance avoidance goal orientation, students were 36% more likely to graduate within seven years. Step four mirrored the previous two models in that it really didn't add anything of importance. For this step, Block Chi Square was not significant, $\chi^2(2) = 1.25$, $p = .54$, and Model Chi Square was, $\chi^2(16) = 42.83$, $p < .01$. The Nagelkerke R^2 value remained constant at .11. All predictors that were significant in the previous step were also significant here. In step five, both Block Chi Square ($\chi^2(1) = 18.56$, $p < .01$) and Model Chi Square ($\chi^2(17) = 61.39$, $p < .01$) were significant. The Nagelkerke R^2 value increased slightly to .15, which is lower than that of Model One (.18), and higher than that of Model Two (.13). Compared to previous models, this model yielded the most significant predictors for the final step. Race, $\chi^2(4) = 7.16$, $p = .13$, or more importantly being Black, $\chi^2(1) = 5.85$, $OR = 3.41$, $p < .05$, remained a significant predictor, as did high school GPA, $\chi^2(1) = 5.50$, $OR = 2.00$, $p < .05$, mastery goal orientation, $\chi^2(1) = 8.92$, $OR = 1.67$, $p < .01$, and performance avoidance goal orientation, $\chi^2(1) = 3.87$, $OR = 1.35$, $p < .05$. Similar to the other two models, first-semester college GPA emerged as a significant predictor of graduation, $\chi^2(1) = 17.64$, $OR = 1.76$, $p < .01$.

Retention. Models that predicted retention after four and seven years looked very similar to the seven-year graduation models with a couple differences. Most notably, high school GPA, which was always significant in the graduation models, was not significant in either of the retention models. Also, in the four-year retention model, being Asian proved to be a significant predictor of graduation compared to being White, $\chi^2 = 5.51$, $OR = 2.07$, $p < .05$, but this was not the case in the five-year retention model. All other predictors that were significant in the seven year graduation model remained significant in both of the retention models.

Discussion

With dropout rates reported as high as 39.4% for full time college students (*Time is the enemy summary*, 2011), and the ever growing need to have a degree in the workforce, it is necessary to examine which qualities within a person best predict their likelihood of college graduation. This is important to college administrators who are making high-stakes decisions about who to admit to their programs, but also to educators who are striving to fix academic problems that students may have, and create intervention programs to help put students on a better path that leads to a university degree. The present study examined predictors of college graduation outside of the most typically used high school GPA and SAT scores (DeBerard et al., 2004; Robbins et al., 2004), including demographic predictors (gender, race, living situation), aspects of motivation (task value, self efficacy, test anxiety), adhering to a goal orientation (mastery, performance approach, performance avoidance), use of learning strategies (cognitive and metacognitive learning strategies), and first-semester college performance. The more typically used predictors, high school GPA and SAT score, were also examined.

Overall, not many of the research hypotheses were supported and very few of the variables mentioned seemed to be adequate predictors of college retention or graduation, in four, five, and seven years. Although a greater percentage of females graduated than males (64% compared to 58%), this difference was not significant, and gender did not

prove to be a predictor of college graduation in any of the three models. This finding supports the work done by McGrath and Braunstein (1997) as well as Murtaugh et al. (1999) who found no significant differences in graduation rates between males and females, and stands in opposition to the work done by Galicki and McEwen (1989) and Johnson (1997) who found that females graduate at higher rates than males.

The demographic predictor, race, yielded interesting results in the present study. Previous literature was mixed as to if race played a role in college graduation rates with some studies indicating that Whites and Asians had higher retention rates than Blacks and Hispanics (Murtaugh et al., 1999) and other studies reporting no differences (BeBerard et al., 2004; McGrath & Braunstein, 1997). It was hypothesized that Whites and Asians would have higher graduation rates than the other minority groups, but his hypothesis was not supported. Interestingly, it was found that being Black actually acted as a positive predictor of college graduation in several of the different models, with 74% of Black students eventually attaining a degree, compared to 60% of Whites and 62% of Asians. Looking at odds ratios, being black increased ones' odds of graduating in five years by nearly three times compared to Whites, holding all other predictors constant. Not only this, but Black students are graduating in fewer semesters than all other races. This finding stands in stark opposition to the literature, so perhaps there is something unique about the Black population at George Mason University where this sample was drawn from. Another possible explanation for these unique findings is that perhaps students are not actually dropping out of college, but rather transferring to other universities. If this is the case, perhaps the black students from the sample are not

transferring, but rather completing their degrees as GMU, therefore misrepresenting their levels of retention and graduation compared to the other races. This problem has been observed in other studies (Robbins et al., 2004), and is often used as a justification as to why college GPA is used as an outcome variable as opposed to retention or graduation rates (Robbins et al., 2006).

Findings indicated that 64% of those who lived on campus eventually went on to earn a degree whereas only 59% of those who lived off campus did the same. This difference was small and not significant, and living situation did not act as a useful predictor in any of the logistic regression models. This finding stands in opposition to research which indicates that those living on campus are more vested in their universities, and tend to achieve more and graduate at higher rates than those who do not (Johnson, 1997; Robbins et al., 2004; Stage, 1989).

Results from the present study pertaining to prior achievement measures, high school GPA and SAT scores, partially support the researcher's hypothesis, and support much of what is found in the literature. It was hypothesized that both high school GPA and SAT scores would be significant predictors of graduation. Results indicated that those who graduated in four, five, and seven years all had significantly higher high school GPAs than those who did not. Also, high school GPA emerged as one of the few variables associated with time until graduation, with students with higher GPAs graduating in fewer semesters than those with lower GPAs. For SAT scores, significant differences were found for graduation in four years with those graduating having higher scores than those who did not. Differences in SAT scores were marginally significant

looking at five year graduation outcomes, and no differences were seen looking at seven year graduation outcomes. This means that SAT scores may act as a useful predictor in predicting who will graduate in the standard four year time frame (ignoring all other predictor variables), but beyond that, the test has little predictive ability. In the logistic regression models, high school GPA always acted as a strong predictor of college graduation. Of all variables, high school GPA was actually the strongest predictor of graduation. For all three graduation time frames, holding other predictors constant, for each point added to high school GPA, students were nearly twice as likely to graduate from college in that given time frame. SAT score never acted as a significant predictor of college graduation with all other variables entered into the model. These findings support previous literature which found that high school GPA acts as a better predictor of college retention than SAT scores (Swick & Sklar, 2005). The fact that SAT score did not seem to be a reliable predictor of college graduation did stand in opposition to some literature (Murtaugh et al., 1999), but perhaps the fact that that variable was entered in the same step as high school GPA, in the logistic regression model, meant that its' predictive power was lost. If it is the case that SAT scores do not act as a unique predictor of college retention/graduation above and beyond high school GPA, perhaps universities should not base their admittance decisions so heavily on this one test score.

Contrary to the researcher's hypothesis, aspects of motivation in the first semester did not seem to play a large role in predicting college graduation. It was hypothesized that higher levels of task value and self efficacy and lower levels of test anxiety would be predictive of graduation, but this was not found. Interestingly, it was found that higher

levels of task value actually marginally predicted *lower* levels of graduation, looking at the four and five year graduation outcomes. It is possible that these lack of, and unexpected, findings are the result of the way some of these constructs were conceptualized. Task value is typically domain specific, meaning it is measured for just one class. In the present study, task value measured more globally, and questions were asked regarding the entire college experience, not just one specific domain.

Goal orientation, specifically mastery goal orientation, were hypothesized to be predictors of college graduation, and this hypothesis was partially supported. For five-year outcomes, holding all other predictors constant, for each point higher on the Mastery Goal Orientation subscale, students' had 35% greater odds of graduating. This percentage increased to 67% more likely looking at seven-year graduation outcomes. These results supported findings by Kitsantas et al. (2008) and Robbins et al. (2004) who found that higher levels of mastery goal orientation are associated with increased achievement and retention in college. It was hypothesized that higher levels of performance avoidance goal orientation would be associated with a decrease in likelihood of graduation, but interestingly, the opposite was found. For seven-year graduation outcomes, holding all other predictors constant, for each point higher on the Performance Avoidance subscale, students were actually 35% more likely to graduate. This is to say that coming to class just to get good grades and avoid demonstrations of one's own incompetencies actually was predictive of eventually receiving a degree in seven years. This is in opposition to findings by Elliot and McGregor (1999) who found that performance avoidance goal orientation is negatively associated with achievement.

Based on the literature (Ford et al., 1998; Johnson, 1997; Pintrich et al., 1993), it was hypothesized that the use of cognitive strategies and self regulation would be predictive of college graduation. In all of the models, in each of the steps, neither of these constructs was significant and including these variables in the model did not increase the amount of variance explained. Of all of the groups of variables added to the models, the use of cognitive learning strategies and self regulation seemed to be among the weakest predictors of college graduation, holding all other predictors constant. Alternative logistic regression models were conducted to see if entering learning strategy variables in step three as opposed to step four would yield different results, but the results remained consistent with the original models.

As hypothesized, first-semester college GPA proved to be a useful predictor of college graduation for all outcomes. Holding all other predictors constant, for each point increase in first-semester college GPA, the likelihood of graduating in four years increased 209%. For five and seven-year outcomes, holding all other predictors constant, the likelihood of graduation increased 176%. This variable was the second strongest predictor of college graduation, second only to high school GPA. Also, first-semester GPA was one of the few variables related to time until graduation, with those with higher GPAs graduating in fewer semesters.

As the present study did not reveal very much about what is going on within college students that affects their retention, and ultimately graduation, there must be other constructs at play that perhaps are more influential. Perhaps students who used more university resources, such as libraries, or students who meet more often with professors,

graduate at higher rates than those who do not. Perhaps students with higher levels of institutional affiliation care more about their school, and this keeps them enrolled until graduation. It is possible that external factors, such as having a job or not, impacts the rate in which students graduate. Maybe how much of students' education is being paid for from the parent serves as an important predictor of retention and graduation. These are important topics for future research.

All of this said, it is quite striking that some variables, namely the goal orientation variables, are found to important predictors of graduation, but only looking at the seven-year outcomes. These variables were not important for those who completed their degrees in the traditional four year, fashion, yet they proved to be significant in predicting who would *persist* in staying in school long after that. Perhaps for those with the means to complete a degree in the standard amount of time, these aspects of motivation are not important, but for those lacking in these means, they are quite important, and worthy of examination.

There are a couple of limitations of the present study that should be mentioned. Although the sample used was somewhat ethnically diverse, a large percentage of the students came from middle-class suburban households who had an average income of \$70,000 per year and who had very educated parents. The average level of parental education for the sample was in between some college/professional school and having a bachelor's degree, so therefore results are only generalizable to similar university samples. As previously mentioned, the measures that were used for task value and self-regulation were global, and assessed students' views of college in general, instead of in

one specific domain, such as a math class. Altering these questions may have changed the measures in such a way that they did not truly capture task value and self regulation, and perhaps this is why findings were not as expected. Also, as mentioned, it is unknown if students who were coded as dropping out actually dropped out of college or not. It is very possible that these students transferred to other universities and actually went on to earn a degree. This same problem has been observed in other studies (Robbins et al., 2004), and researchers often use this problem as justification for using achievement as their outcome measure, as opposed to retention or graduation (Robbins et al., 2006).

There are several implications gleaned from the present study. Results suggest that high school GPA is the strongest predictor of college graduation, so perhaps this should value should be weighed as more important than SAT score when making admittance decisions. The second strongest predictor of graduation/retention was first-semester college GPA. Perhaps colleges can devise intervention programs to ensure that students do well their first semester, or they can radically change the way they admit students. Perhaps students can be granted a probationary admittance with the caveat that they need to achieve a certain GPA within the first year, or they will be kicked out of the university. Another strategy for increasing graduation rates is instilling ideas about mastery goal orientation in students, as that predictor was shown to be significant in predicting five- and seven-year outcomes.

Future directions in this research could correct the limitations discussed and reword the questions on the motivation questionnaires to perhaps better capture these constructs. Recall that these scales were created in order to capture a specific measure of

motivation, not a global one as they were used in the present study. Also, several of the findings from this study stand in opposition to findings in the literature, so these need to be explored further. Notably, what was it about the Black students in this sample that allowed them to graduate at higher rates than the White sample, where the opposite of this finding was typically reported in the literature? Other future directions in this research could look at the interactions between the variables discussed to see if there are differences when comparing those who graduated and did not. Perhaps gender interacts with different predictors making some predictors significant for one gender but not the other. A final future direction could examine the extent to which the predictors discussed are associated with college GPA at different time points, including graduation. This could help fill some gaps in the literature pertaining to differences in predictors discussed predicting achievement versus graduation. Overall, this research adds mixed findings to the literature, and more research needs to be conducted in order to find out what exactly causes someone to stay in college through graduation so that university officials can make better admittance decisions, and educators can help students already in school earn the degree that they are seeking.

Tables

Table 1
Graduation Rates in 4,5, and 7 Years, Overall and Bivariate Associations with Independent Predictors

| Predictor | Graduated in 4 | | Graduated in 5 | | Graduated in 7 | |
|-----------------------------|----------------------|----------------------|----------------------|----------------------|---------------------|---------------------|
| | Yes | No | Yes | No | Yes | No |
| Frequency (% within) | 182 (30.8%) | 407 (69.2%) | 274 (46.5%) | 315 (53.5%) | 362 (62.0%) | 221 (38.0%) |
| Gender | | | | | | |
| Male | 60 (27.1%) | 161 (72.9%) | 97 (43.9%) | 124 (56.1%) | 127 (58.3%) | 91 (41.7%) |
| Female | 122 (33.2%) | 246 (66.8%) | 177 (48.1%) | 191 (51.9%) | 235 (64.4%) | 130 (35.6%) |
| Race | | | | | | |
| White | 122 (33.5%) | 242 (66.5%) | 171 (47.0%) | 193 (53%) | 216 (60.2%) | 143 (39.8%) |
| Black | 15 (35.7%) | 27 (64.3%) | 26 (61.9%) | 16 (38.1%) | 31 (73.8%) | 11 (26.2%) |
| Hispanic | 8 (26.7%) | 22 (73.3%) | 13 (43.3%) | 17 (56.7%) | 18 (62.1%) | 11 (37.9%) |
| Asian | 26 (25.7%) | 75 (74.3%) | 41 (40.6%) | 60 (59.4%) | 63 (62.4%) | 38 (37.6%) |
| Other | 11 (22.0%) | 39 (78.0%) | 21 (42.0%) | 29 (58.0%) | 32 (64.0%) | 18 (36.0%) |
| Living | | | | | | |
| On Campus | 118 (33.0%) | 240 (67.0%) | 174 (48.6%) | 184 (51.4%) | 227 (63.9%) | 128 (36.1%) |
| Off Campus | 64 (27.9%) | 165 (72.1%) | 99 (43.2%) | 130 (56.8%) | 134 (59.3%) | 92 (40.7%) |
| Mean (SD) | | | | | | |
| High School GPA | 3.37* (0.39) | 3.19* (0.37) | 3.32* (0.38) | 3.17* (0.38) | 3.31*(0.39) | 3.15* (0.37) |
| SAT Score | 1101.56* (146.23) | 1065.49* (123.39) | 1087.37+ (135.77) | 1067.47+ (127.96) | 1083.04 (138.91) | 1066.43 (119.73) |
| Task Value | 5.38 (0.83) | 5.42 (0.87) | 5.39 (0.85) | 5.42 (0.87) | 5.42 (0.86) | 5.37 (0.86) |
| Self Efficacy | 3.99 (0.69) | 3.99 (0.75) | 4.01 (0.70) | 3.97 (0.76) | 4.00 (0.72) | 3.97 (0.76) |
| Test Anxiety | 4.04 (1.32) | 4.18 (1.24) | 4.08 (1.26) | 4.19 (1.27) | 4.11 (1.27) | 4.19 (1.27) |
| Mastery Goal | 4.29 (0.73) | 4.23 (0.70) | 4.31+ (0.71) | 4.21+ (0.71) | 4.32* (0.70) | 4.14* (0.73) |
| Perf. Approach | 2.63+ (1.08) | 2.81+ (1.13) | 2.71 (1.15) | 2.80 (1.10) | 2.72 (1.12) | 2.82 (1.11) |
| Perf. Avoidance | 2.92 (1.02) | 2.99 (0.99) | 2.93 (1.02) | 3.01 (0.97) | 2.98 (1.00) | 2.96 (0.98) |
| Cognitive Strategies | 18.19 (3.34) | 18.40 (3.47) | 18.39 (3.40) | 18.29 (3.45) | 18.40 (3.58) | 18.21 (3.20) |
| Self Regulation | 4.42 (0.79) | 4.36 (0.86) | 4.42 (0.82) | 4.34 (0.86) | 4.42+ (0.85) | 4.31+ (0.82) |
| First Semester GPA | 3.03* (0.61) | 2.56* (0.85) | 2.92* (0.66) | 2.52* (0.89) | 2.87* (0.69) | 2.44* (0.93) |

Note. * $p < .05$, + $p < .10$

Table 2
Retention Rates in 4,5, and 7 Years, Overall and Bivariate Associations with Independent Predictors

| Predictor | Retained/Graduated in 4 | | Retained/Graduated in 5 | |
|-----------------------------|-------------------------|---------------------|--------------------------|--------------------------|
| | Yes | No | Yes | No |
| Frequency (% within) | | | | |
| Gender | | | | |
| Male | 153 (70.2%) | 65 (29.8%) | 146 (67.0%) | 72 (33.0%) |
| Female | 253 (69.3%) | 112 (30.7%) | 246 (67.4%) | 119 (32.6%) |
| Race | | | | |
| White | 238 (66.3%) | 121 (33.7%) | 230 (64.1%) | 129 (35.9%) |
| Black | 33 (78.6%) | 9 (21.4%) | 33 (78.6%) | 9 (21.4%) |
| Hispanic | 22 (75.9%) | 7 (24.1%) | 22 (75.9%) | 7 (24.1%) |
| Asian | 75 (74.3%) | 26 (25.7%) | 70 (69.3%) | 31 (30.7%) |
| Other | 36 (72.0%) | 14 (28.0%) | 35 (70%) | 15 (30.0%) |
| Living | | | | |
| On Campus | 254 (71.5%) | 101 (28.5%) | 241 (67.9%) | 114 (32.1%) |
| Off Campus | 151 (66.8%) | 75 (33.2%) | 150 (66.4%) | 76 (33.6%) |
| Mean (SD) | | | | |
| High School GPA | 3.28* (0.39) | 3.17* (0.36) | 3.29* (0.40) | 3.16* (.35) |
| SAT Score | 1080.36 (137.72) | 1068.81 (118.49) | 1082.26 (139.17) | 1065.61 (115.96) |
| Task Value | 5.41 (0.88) | 5.38 (0.82) | 5.41 (0.87) | 5.39 (.83) |
| Self Efficacy | 4.00 (0.74) | 3.97 (0.72) | 4.00 (0.73) | 3.96 (.75) |
| Test Anxiety | 4.11 (1.28) | 4.22 (1.24) | 4.08 ⁺ (1.28) | 4.27 ⁺ (1.24) |
| Mastery Goal | 4.30* (0.71) | 4.15* (0.72) | 4.31* (0.70) | 4.14* (.73) |
| Perf. Approach | 2.76 (1.14) | 2.76 (1.09) | 2.73 (1.12) | 2.82 (1.13) |
| Perf. Avoidance | 3.00 (1.01) | 2.91 (0.96) | 2.97 (1.01) | 2.96 (.97) |
| Cognitive Strategies | 18.36 (3.54) | 18.26 (3.21) | 18.34 (3.57) | 18.32 (3.16) |
| Self Regulation | 4.41 (0.84) | 4.31 (0.85) | 4.41 (0.85) | 4.31 (.84) |
| First Semester GPA | 2.79* (0.72) | 2.51* (0.97) | 2.81* (0.71) | 2.49* (.95) |

Note. * $p < .05$, ⁺ $p < .10$

Table 3

Model One: Hierarchical Logistic Regression Predicting Graduation in Four Years (N=514)

| Predictor | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Step 5 | |
|----------------------|-----------|---------------|-----------|---------------|-------------------|---------------|-----------|---------------|-------------------|---------------|
| | <i>OR</i> | <i>SE (B)</i> | <i>OR</i> | <i>SE (B)</i> | <i>OR</i> | <i>SE (B)</i> | <i>OR</i> | <i>SE (B)</i> | <i>OR</i> | <i>SE (B)</i> |
| Gender (Male) | 0.74 | 0.202 | 0.79 | 0.217 | 0.84 | .227 | .84 | .229 | .90 | .234 |
| Race** (White) | 3.17 | | 4.87 | | 4.32 | | 4.25 | | 3.41 | |
| Black | 1.21 | 0.388 | 1.70 | 0.414 | 1.63 | 0.417 | 1.59 | 0.416 | 1.60 | 0.427 |
| Hispanic | 0.84 | 0.449 | 0.80 | 0.460 | 0.74 | 0.469 | 0.73 | 0.470 | 0.77 | 0.472 |
| Asian | 0.71 | 0.285 | 0.71 | 0.294 | 0.74 | 0.298 | 0.75 | 0.300 | 0.86 | 0.308 |
| Other | 0.60 | 0.389 | 0.59 | 0.403 | 0.58 | 0.410 | 0.57 | 0.410 | 0.58 | 0.420 |
| Living (Off Campus) | 0.88 | 0.216 | 0.90 | 0.226 | 0.85 | 0.229 | 0.83 | 0.230 | 0.72 | 0.237 |
| High School GPA | | | 3.27* | 0.287 | 3.37* | 0.292 | 3.32* | 0.292 | 2.19* | 0.308 |
| SAT Score | | | 1.00 | 0.001 | 1.00 ⁺ | 0.001 | 1.00 | 0.001 | 1.00 | 0.001 |
| Task Value | | | | | 0.80 ⁺ | 0.134 | 0.81 | 0.145 | 0.77 ⁺ | 0.150 |
| Self Efficacy | | | | | 0.94 | 0.177 | 0.93 | 0.184 | 0.95 | 0.190 |
| Test Anxiety | | | | | 0.96 | 0.085 | 0.98 | 0.086 | 0.98 | 0.088 |
| Mastery Goal | | | | | 1.31 | 0.173 | 1.31 | 0.175 | 1.27 | 0.179 |
| Perf. Approach | | | | | 0.81 | 0.136 | 0.81 | 0.136 | 0.80 | 0.139 |
| Perf. Avoidance | | | | | 1.19 | 0.151 | 1.20 | 0.151 | 1.19 | 0.154 |
| Cognitive Strategies | | | | | | | 0.94 | 0.046 | 0.94 | 0.048 |
| Self Regulation | | | | | | | 1.34 | 0.186 | 1.30 | 0.192 |
| First Semester GPA | | | | | | | | | 2.09* | 0.164 |

Note. * $p < .05$, ⁺ $p < .10$. ** = Wald Statistic.

Table 4

Model Two: Hierarchical Logistic Regression Predicting Graduation in Five Years (N=514)

| Predictor | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Step 5 | |
|----------------------|--------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|
| | OR | SE (B) | OR | SE (B) | OR | SE (B) | OR | SE (B) | OR | SE (B) |
| Gender (Male) | 0.76 | 0.187 | 0.83 | 0.199 | 0.86 | 0.208 | 0.87 | 0.209 | 0.91 | 0.213 |
| Race** (White) | 6.03 | | 8.90 ⁺ | | 7.96 ⁺ | | 7.84 ⁺ | | 6.95 | |
| Black | 2.31* | 0.401 | 3.06* | 0.422 | 2.95 | 0.426 | 2.92* | 0.426 | 2.93* | 0.431 |
| Hispanic | 1.04 | 0.412 | 0.99 | 0.420 | 0.95 | 0.425 | 0.94 | 0.425 | 0.96 | 0.426 |
| Asian | 0.79 | 0.260 | 0.78 | 0.265 | 0.79 | 0.270 | 0.79 | 0.270 | 0.89 | 0.277 |
| Other | 0.83 | 0.341 | 0.84 | 0.349 | 0.85 | 0.353 | 0.85 | 0.353 | 0.87 | 0.360 |
| Living (Off Campus) | 0.92 | 0.201 | 0.94 | 0.207 | 0.90 | 0.210 | 0.90 | 0.210 | 0.83 | 0.215 |
| High School GPA | | | 2.65* | 0.267 | 2.74* | 0.271 | 2.72* | 0.271* | 1.95* | 0.284 |
| SAT Score | | | 1.00 | 0.001 | 1.00 | 0.001 | 1.00 | 0.001 | 1.00 | 0.001 |
| Task Value | | | | | 0.83 | 0.124 | 0.82 | 0.134 | 0.78 ⁺ | 0.138 |
| Self Efficacy | | | | | 0.99 | 0.163 | 0.98 | 0.169 | 1.01 | 0.173 |
| Test Anxiety | | | | | 0.98 | 0.079 | 0.98 | 0.080 | 0.98 | 0.081 |
| Mastery Goal | | | | | 1.37* | 0.160 | 1.37* | 0.161 | 1.35 ⁺ | 0.164 |
| Perf. Approach | | | | | 0.95 | 0.124 | 0.95 | 0.124 | 0.96 | 0.127 |
| Perf. Avoidance | | | | | 1.08 | 0.138 | 1.08 | 0.138 | 1.06 | 0.142 |
| Cognitive Strategies | | | | | | | 0.99 | 0.043 | 1.00 | 0.044 |
| Self Regulation | | | | | | | 1.09 | 0.171 | 1.04 | 0.175 |
| First Semester GPA | | | | | | | | | 1.76* | 0.137 |

Note. * $p < .05$, ⁺ $p < .10$. ** = Wald Statistic.

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Table 5

Model Three: Hierarchical Logistic Regression Predicting Graduation in Seven Years (N=514)

| Predictor            | Step 1 |        | Step 2 |        | Step 3 |        | Step 4 |        | Step 5 |        |
|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                      | OR     | SE (B) | OR     | SE (B) | OR     | SE (B) | OR     | SE (B) | OR     | SE (B) |
| Gender (Male)        | 0.78   | 0.192  | 0.89   | 0.205  | 0.94   | 0.216  | 0.94   | 0.217  | 0.99   | 0.222  |
| Race** (White)       | 4.85   |        | 6.86   |        | 6.73   |        | 6.42   |        | 7.16   |        |
| Black                | 2.65*  | 0.470  | 3.49*  | 0.491  | 3.52*  | 0.504  | 3.40*  | 0.503  | 3.41*  | 0.508  |
| Hispanic             | 1.34   | 0.436  | 1.27   | 0.444  | 1.20   | 0.450  | 1.18   | 0.450  | 1.17   | 0.451  |
| Asian                | 1.21   | 0.267  | 1.20   | 0.273  | 1.26   | 0.280  | 1.28   | 0.281  | 1.48   | 0.291  |
| Other                | 1.21   | 0.356  | 1.27   | 0.363  | 1.30   | 0.370  | 1.27   | 0.371  | 1.33   | 0.381  |
| Living (Off Campus)  | 0.85   | 0.208  | 0.87   | 0.212  | 0.83   | 0.218  | 0.83   | 0.218  | 0.76   | 0.224  |
| High School GPA      |        |        | 2.85*  | 0.278  | 2.87*  | 0.283  | 2.83*  | 0.283  | 2.00*  | 0.296  |
| SAT Score            |        |        | 1.00   | 0.001  | 1.00   | 0.001  | 1.00   | 0.001  | 1.00   | 0.001  |
| Task Value           |        |        |        |        | 0.95   | 0.129  | 0.95   | 0.139  | 0.91   | 0.143  |
| Self Efficacy        |        |        |        |        | 0.87   | 0.171  | 0.85   | 0.177  | 0.86   | 0.182  |
| Test Anxiety         |        |        |        |        | 0.93   | 0.083  | 0.94   | 0.084  | 0.94   | 0.085  |
| Mastery Goal         |        |        |        |        | 1.67*  | 0.169  | 1.67*  | 0.169  | 1.67*  | 0.172  |
| Perf. Approach       |        |        |        |        | 0.83   | 0.131  | 0.83   | 0.131  | 0.84   | 0.136  |
| Perf. Avoidance      |        |        |        |        | 1.36*  | 0.147  | 1.36*  | 0.148  | 1.35*  | 0.152  |
| Cognitive Strategies |        |        |        |        |        |        | 0.96   | 0.045  | 0.97   | 0.046  |
| Self Regulation      |        |        |        |        |        |        | 1.22   | 0.180  | 1.178  | 0.185  |
| First Semester GPA   |        |        |        |        |        |        |        |        | 1.76*  | 0.135  |

Note. \*  $p < .05$ , +  $p < .10$ . \*\* = Wald Statistic.

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## **CURRICULUM VITAE**

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