5-2018

Be Cool, Stay in School: The Habits, Resources, and Confidence College Students Need to Succeed

Matthew Staheli
Utah State University

BE COOL, STAY IN SCHOOL: THE HABITS, RESOURCES, AND CONFIDENCE COLLEGE STUDENTS NEED TO SUCCEED

by

Matthew Staheli

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

Approved:

Scott C. Bates, Ph.D. Major Professor	Renee Galliher, Ph.D. Committee Member
Michael Levin, Ph.D. Committee Member	Mark R. McLellan, Ph.D. Vice President for Research and Dean of the School of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

2018

ABSTRACT

Be Cool, Stay in School: The Habits, Resources, and Confidence College Students Need to Succeed

by

Matthew Staheli, Master of Science

Utah State University, 2018

Major Professor: Scott C. Bates, Ph.D.
Department: Psychology

Earning a college degree yields many benefits. In addition to an increased income, college degree earners generally have greater job satisfaction, make healthier life choices, are better communicators, and have greater social mobility. Even with all of these benefits, however, some colleges are seeing graduation rates as low as 32%. One of the greatest contributing factors affecting the drop-out rate of undergraduate college students is poor academic performance in their courses. In this study, we sought to identify several academic resources, study behaviors, academic self-efficacy scores, and demographic information to assess which variables predicted higher academic performance. There were 148 undergraduate student participants, out of 696 possible students (21.3%), from three sections of Introductory Psychology courses at Utah State University. They participated in a multi-phase survey to assess study habits, and resources that they used when preparing for their psychology course exams. T-test analyses

identified statistically significant ($p < .05$) differences between men and women, and between first generation and non-first-generation students. Women studied almost twice as much, compared to men, in terms of hours spent, and course content covered. Academically, first-generation students struggled in almost every way, compared to non-first-generation students. Pearson correlation matrixes were conducted to identify which variables relate to each other. Finally, a multiple linear regression analysis identified statistically significant ($p < .05$) predictors of participants' course grade, which were class attendance, academic self-efficacy scores, employment hours, and their current grade point average. Implications and suggestions for college freshmen orientation instructors and for academic advisors are presented, to increase the likelihood of academic success for certain student populations. Further research is recommended to assess whether similar findings would manifest from broader samples of college students.

(95 pages)

PUBLIC ABSTRACT

Be Cool, Stay in School: The Habits, Resources, and Confidence College Students Need to Succeed

by

Matthew Staheli

Earning a college degree yields many benefits. In addition to an increased income, college degree earners generally have greater job satisfaction, make healthier life choices, are better communicators, and have greater social mobility. Even with all of these benefits, however, some colleges are seeing graduation rates as low as 32%. One of the greatest contributing factors affecting the dropout rate of undergraduate college students is poor academic performance in their courses. In this study, we sought to identify several academic resources, study behaviors, academic self-confidence scores, and demographic information to assess what types of behaviors and resources may lead to higher academic performance. There were 148 undergraduate student participants, out of 696 possible students (21.3%), from three sections of Introductory Psychology courses at Utah State University. They participated in a multi-phase survey to assess study habits, and resources that they used when preparing for their psychology course exams. Statistical analyses identified several significant differences between men and women, and between first generation and non-first-generation students. Women studied almost twice as much, compared to men, in

terms of hours spent, and course content covered. Academically, first-generation students struggled in almost every way, compared to non-first-generation students. After identifying how the study behavior and resource variables influenced each other, we also identified which variables were the most influential on the students' final course grades. We found that a student's GPA (grade point average) was the most important factor, followed by their self-confidence in their academic abilities, followed by their class attendance, followed by how many hours they work outside of school. All of those variables likely affect a student's final grade, and it is important that college students are informed about which study resources and behaviors they should utilize, to be as successful as possible.

ACKNOWLEDGMENTS

I would like to thank Dr. Scott Bates for his support, expertise, and feedback while writing this thesis. I would also like to thank my committee members, Drs. Renee Galliher and Michael Levin, for their professional expertise.

I extend special gratitude to my family, friends, colleagues, and to my partner, for their encouragement and support.

Matthew Staheli

CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

College enrollments are rising. In fall, 2017, approximately 20.4 million students were enrolled in colleges and universities in the United States, an increase of 5.1 million college students since fall, 2000 (U.S. Department of Education, 2015). It is estimated that by 2025, college enrollment rates will rise by an additional 15% (Hussar & Bailey, 2017). There are numerous benefits associated with a college degree: greater earning potential, better career opportunities, job satisfaction, the ability to better communicate, greater social mobility, and even better health.

Financial benefits of attending college are clear. According to the 2013 Census Bureau, the median annual earnings of those with bachelor's degrees were $79,522 versus $40,701 with only a high school diploma (U.S. Census Bureau, 2014). In 2002, an assessment of lifetime earnings shows that those with only a high school diploma earn, on average, $1.2 million; while college graduates earn $2.1 million on average (Day & Newburger, 2002).

Aside from the financial benefits, a college education provides many more benefits. According to Oreopoulos and Savanes (2011), college education also increases employability, as well as affecting how much people enjoy their jobs. People with a college education also make better choices concerning marriage, parenting, goal-orientation, and risky behaviors. These positive byproducts not only benefit the degree holders, but also the lives of their children and of society

(Hout, 2012).

Finally, having a college degree has also been shown to be associated with better health. Not only will a degree holder have access to better insurance-related health benefits (Bauldry, 2012), but they also tend to exercise more and to smoke less than those with only a high-school diploma (Lenk et al., 2012).

Despite the numerous benefits of a college degree, many college students do not finish college. For 4-year universities with competitive acceptance rates (only 25% of applicants are accepted), 88% of students graduate within 6 years, and 4-year universities with open admissions have a much lower graduation rate of 32% within 6 years (U.S. Department of Education, 2017).

Dropping out of college can have economic impacts: affecting individuals, families, and schools. The average college tuition and fees, per semester, are approximately $4,985 for in-state, 4-year public universities, and $12,810 for out-of-state, 4-year public universities (College Board, 2017). These figures do not include housing, meals, transportation, books, or school supplies. By 2016, 44 million borrowers owed $37,172 in student debt, on average (Dunn, 2017). Students who drop out may accumulate debt, but don't acquire the degree to more easily pay it off.

Retention is an issue for institutions, too. For the 2010-2011 academic year, 1,669 colleges and universities collectively lost $16.5 billion in tuition dollars, due to student attrition, with the average school losing $9,910,811 (Raisman, 2013).

Of the approximately 20.4 million college students (U.S. Department of

Education, 2015), 30% of them drop out before obtaining a degree, and poor academic performance contributes to 45% of these dropouts (Stinebrickner & Stinebrickner, 2014). This finding aligns with others (Araque, Roldán, & Salguero, 2009; Mattison, 2013): undergraduate students have reported that a lack in funding, lack of motivation, and an inability to overcome obstacles, like poor academic performance, are the main reasons for dropping out of college.

Another obstacle is the transition to college. While in high school, students experience a step-by-step increase in academic rigor, year by year. Entering college, however, demands much higher academic expectations, particularly for first-generation college students (Ishitani, 2003). In college, students are expected to study more, to live away from home for the first time, to be more independent, to take full responsibilities of their grades, and to attend classes with hundreds of other students. Additionally, academic skills learned in high school may not necessarily transfer to the academic requirements of higher education (Winstone & Bretton, 2013).

College students utilize a variety of study strategies to prepare for exams. While some students may read their text books word for word, others may find that they prefer flashcards of key terms and concepts. Some students may find study groups to be helpful, while others may prefer to study alone to review their meticulous notes. To assess college students' study habits, this study will assess the resources students use (lecture slides, textbooks, study groups, etc.), and how intensely they study (how many total hours, how many sessions, etc.). Further, the associations between these study behaviors and students' academic

outcomes will be evaluated, using overall course grades as the metric for assessing academic performance. Understanding what students need to do to improve their academic performance could potentially be beneficial for addressing the previously mentioned dropout population.

CHAPTER II

LITERATURE REVIEW

First-year college students often enter college with poor learning habits that they developed from secondary education (Entwistle, Tait, & Speth, 1996; McLean, Van Wyk, Peters-Futre, & Higgins-Opitz, 2006). Being exposed to a different learning environment like college requires adaptation of learning skills (MacQuarrie, Howe, & Boyle, 2012), and failing to adapt increases the likelihood of non-completion of college (McLean et al., 2006). Helping students unlearn poor academic habits, and learn effective ones, can be a significant struggle for institutions and especially for college instructors, who are often striving to teach content, rather than academic skills.

One way to improve the learning/study habits of first-year college students is to expose them to effective study techniques (Gadzella, Goldston, & Zimmerman, 1977). Simply making them aware of others' effective study habits significantly improves their own. Another way in which students improved their study habits is by simply being an education-based major (Torres, Fernández, & Vázquez, 2011). This suggests that students who have more opportunities to teach, develop more effective study habits, as they likely notice effective and ineffective study habits in their own students.

Academic Resources Correlations of Academic Performance

Based on previous literature (discussed below), the following study

resources have been identified as effective for improving academic performance: attending class, reading from the textbook, taking and reviewing notes, reviewing lecture slides, attending supplemental instruction (SI) sessions or lab discussions, classmate group study, reviewing a study guide, making and reviewing flashcards, utilizing electronic textbook resources, and finally, using alternative electronic resources (e.g., YouTube, google, Wikipedia, etc.). In this review of the literature, I will describe each of the strategies/resources below.

Attending class

Class attendance has repeatedly been shown to have strong, statistically significant correlations with course grades and academic performance (Brocato, 1989; Caska & Prentice, 2009; Clifton, 2007; L. Jones, 1931; C. H. Jones, 1984; Taylor, 2012; Van Blerkom, 1992). For example, Credé, Roch, and Kieszczynska (2011) found, for a sample of 21,195 students, a positive correlation of $\rho = .44$ between class attendance and course grades; and the positive correlation between class attendance and overall GPA was $\rho = .41$. They also found class attendance to be a stronger predictor of college grades than many other standard predictors of academic success, such as standardized tests like the SAT and ACT, high school GPA, and study habits and skills. Similarly, assessing macroeconomics students over a four year period, Brocato found the relationship between class attendance and grade performance was $\rho = .527$, again, suggesting a strong, positive, predictor of grades.

So, if class attendance is one of the strongest predictors of academic

success, then it is also essential to understand why students choose not to attend. Students' self-reports indicate that the reasons they missed class were: because they needed the time to complete work in other courses, because they perceived the course as being boring, because of illness, and because the class time interfered with their social lives (Van Blerkom, 1992).

Zazulia and Goldhoff (2014) assessed the opinions of pre-medical students (*n* = 382) and medical faculty (*n* = 248) regarding class attendance. Both the students and especially the faculty reported that poor attendance has negative impacts on faculty enthusiasm, which affects teaching and lecture quality. Although students reported that they should have a choice when to learn the material (i.e., watching lecture videos later) faculty opined that it is much more difficult to lecture to a sparsely populated classroom, and that severe lack of participation and attendance reflects a lack of students' professionalism. Most students perceive face-to-face attendance as a means to simply learn the course content; but in addition to learning the content, faculty members consider class time to serve as important opportunities for students to develop professional socialization skills (Zazulia & Goldhoff, 2014).

Reading the Textbook

A majority of students responded that they rarely read their textbooks, that they perceive textbooks as being useless, and they think that reading textbooks is unnecessary to improving their grades (Sikorski et al., 2002). However, research has shown that the opposite is true.

One study (Wandersee, 1988) found a significant positive correlation between how much time students spend reading their textbooks, and their grades. Eisenman, Melville, and St. Andrie (1992) found a similar relationship: a positive correlation between a percentage of textbook recollection (how much textbook information students were able to recall) and their final grades. They tested 68 undergraduate students (enrolled in Introduction to Psychology) on their ability to recall material from their textbook readings. They found that students who were able to recall at least 70% of the textbook material were likely the same students who tended to earn A's in the course. Students who earned B's, C's, D's, F's, or who withdrew, were not able to recall at least 70% of the textbook reading material.

With the recent development of electronic textbooks, researchers have been assessing differences between paper and electronic texts. When comparing the learning outcomes and course grades, there seems to be no difference between students who use electronic textbooks versus students who use hard-copy textbooks (Rockinson-Szapkiw, Courduff, Carter, & Bennett, 2013; Terpend, Gattiker, & Lowe, 2014); both sources seem to be equally beneficial.

Taking and Reviewing Notes

There are effective and ineffective ways to implement any academic strategy. For example, a student could attend every class, but spend every class session on social media websites. Or a student could casually read an entire chapter of the textbook while simultaneously watching television. The literature

suggests that the same is true for note taking strategies: there are effective and ineffective ways to take and review notes.

Early literature on note taking addressed the question: Is it better for students to take notes during lectures, or to listen attentively instead? The literature on the matter suggests that taking notes, rather than only listening, results in better learning and academic outcomes. Kobayashi's (2005) meta-analysis of 57 note taking versus no note-taking comparison studies indicated that taking notes leads to positive, albeit modest, academic and learning outcomes. More specifically, he found that the encoding process that note taking produces, is especially helpful for deeper cognitive processing. This encoding process is especially essential for exams that require recalling the content rather than simply recognizing it (Davis & Hult, 1997; Hu, 1999). For example, encoding information is a more suitable strategy for exams that require fill-in-the-blank answers with no possible answers listed as prompts. Other styles of exams often provide a possibility of multiple choices. For such exams, simple recognition is usually sufficient, as opposed to recalling information. Students can usually obtain decent scores by simply recognizing key terms; deep processing of information would not be required.

Generally, the more extensive the note-taking, the better the academic outcome will be (Kiewra & Benton, 1988). However, the amount of notes to be taken depends on how much detailed information a student must learn. It may be more effective for students to take summary notes if there is a large amount of information to learn. If there is a small amount of information, then it is more

effective to take detailed, verbatim notes (Moos, 2009). For example, if students are faced with a massive, comprehensive final exam on anatomy, it would be more beneficial to study notes that cover the main, basic concepts of each bodily system: respiratory, circulatory, bone, muscle, etc. If these students were being tested on only the digestive system chapter, then it would be more beneficial to take extensive, detailed notes and to study verbatim information. Crooks, White, and Barnard (2007) suggested that these findings are attributed to cognitive load theory (see Chandler & Sweller, 1991; Sweller, 1988). This theory states that students have limited cognitive resources during instruction, and they must allot this energy when learning new concepts.

Although taking notes is beneficial, is there a best time to do it? Eisner and Rohde (1959) concluded that students could both listen attentively *and* take notes. They divided students, who listened to the same lecture, into two groups. Half of the students took notes during the lecture, and the other half took notes immediately following the lecture. There were no statistical significant differences in the academic and learning outcomes between both groups. As long as students take notes, they will benefit.

When told to take notes on lectures, most students will attempt to distinguish important information, from less important information, and only take notes of the important information, with reasonable success (Kiewra, Mayer, Christensen, Kim, & Risch, 1991). Additionally, students who have background knowledge about the course content are more likely to take more effective notes, because they can more easily identify pertinent information (Peverly, Brobst,

Graham, & Shaw, 2003).

In introductory courses, where students would not likely have previous, background knowledge, guided note-taking strategies have been shown to be more effective for academic outcomes, than self-regulated note-taking (Lawson, Bodle, & McDonough, 2007; Narjaikaew, Emarat, & Cowie, 2009). Guided notes are comparable to worksheets, and they often contain empty quotation marks, diagrams, and fill-in-the-blank items to encourage interactive engagement from students. Essentially, the instructor is guiding students toward the pertinent information.

Supplemental Instruction and Labs

Supplemental Instruction (SI, or, sometimes referred to as peer-assisted learning) is defined as a "collaborative learning program designed to improve student performance," especially in courses that are traditionally difficult (Blanc & Martin, 1994). Advanced students (SI leaders) typically will attend and take notes in all of the classes. Then, during a Supplemental Instruction session, SI leaders will assist undergraduate students in their studies by incorporating various academic strategies like group discussions, informal quizzes, reviews of previous exams, possible predictions of future exam questions, and by providing a proper model for mastery of course content (Martin & Arendale, 1990).

In some courses, SI sessions are considered required 'recitation sessions' in which student attendance will affect their grades; in others, they are less-structured question-and-answer sessions to review course content. SI sessions

differ from peer group study (described in the next section), because they are organized and established by course instructors and senior-student teaching assistants, usually with set schedules.

SI has been shown to significantly improve the course grades of undergraduate students in several different courses, including chemistry (Bronstein, 2008; Congos & Mack, 2005; Gattis, 2002; Stansbury, 2001), econometrics (Dancer, Morrison, & Smith, 2007), calculus (Fayowski & MacMillan, 2008), physics (Hensen & Shelley, 2003), history (Hodges, Dochen, & Joy, 2001), engineering (Mahdi, 2006), statistics (V. Miller, Oldfield, & Bulmer, 2004; Peterfreund, Rath, Xenos, & Bayliss, 2008), biology (Moore & LeDee, 2006; Rath, Peterfreund, Xenos, Bayliss, & Carnal, 2007), political science (Ogden, Thompson, Russell, & Simons, 2003), and mathematics (Parkinson, 2009; Phelps & Evans, 2006; Wright, Wright, & Lamb, 2002). In addition to improving course grades, Supplemental Instruction has also been shown to be positively correlated with lower failure and withdrawal rates, and consequently, higher graduation and retention rates (Dawson, van der Meer, Skalicky & Cowley, 2014).

Group Study

Group study functions differently, and is defined differently, than Supplemental Instruction. During a group study session, there is not necessarily an appointed leader, nor a structured schedule established by the course instructor. Simply put, it is a group of classmates who decide to meet up to learn

the course content together.

One benefit of peer instruction within study groups is greater academic performance, because each group member becomes a “teacher” of the content (Parkinson, 2009; Sokolove & Marbach-Ad, 1999). Parkison conducted a study with mathematics and chemistry students. He implemented a group study, semester-long program in which 20 first-year students became involved, leaving 43 other first-year students to act as members of the control group. At the beginning, these students were evenly matched, but by the end of the semester, the students in the group-study treatment scored 13% higher on average on their exams compared to students in the control group.

In addition to measurable grades, other benefits of group study for students include: gaining a better understanding of the course content (Fagen, Crouch, & Mazur, 2002; Kooloos et al., 2011; Lasry, Mazur, & Watkins, 2008; Merrill & Gilbert, 2008; Willoughby, Wood, McDermott, & McLaren, 2000), developing better study habits (McLean et al., 2006), developing better critical thinking skills (Fung & Howe, 2012), and increasing the likelihood of remaining in college (Lasry et al., 2008).

Although there have been many studies suggesting the numerous benefits of study groups for students, there seems to be sparse literature explaining what students actually do during study group sessions (Christian, 2012).

Study Guides and Lecture Slides

Study guides are any extra study aid that is provided to the students, from

the instructor or teaching assistants, to help students prepare for their exams. Previous literature has shown that students are more likely to study specific content if the study guides are specific as well. However there are some drawbacks to providing study guides to students; they will usually only study what the study guides cover, and they will neglect all other content (Lloyd & Eastman, 1977). Course instructors should be aware of such behaviors when considering supplying study guides to their students, as the amount of time that a meticulous study guide would require to cover all topics, might not be worth the effort.

Lecture slides are provided to students by the instructor, and are designed and displayed by the instructor via presentation software like Microsoft Powerpoint. In addition to displaying the lecture information during class time, the instructor also provides digital copies of the lecture slides for students to review at their leisure.

Study guides and lecture slides are resources to help students understand the course content. Like any study resource, if they are not utilized, then they do little to improve students' grades. Buckley (2013) found that students who repeatedly exposed themselves to course content via study guides saw slight improvements to their grades.

Flashcards

Students use flashcards as an effective way to memorize course content. Usually a key term will be on one side of the card while a definition or explanation will be on the opposite side. It is an effective way to test one's knowledge without

revealing the key information before it is needed.

Making and studying flashcards as a group can also make the learning tasks more effective and enjoyable for students. Rani, Mythili, Devi, Shanthi, and Kalaiselvi (2013) divided 100 biochemistry students into 20 groups of 5 students each. Each group was instructed to create 20 flashcards of biochemistry terms with corresponding illustrations. In addition to enjoyment, these students also reported a stronger sense of involvement in their learning experience (Rani et al., 2013). Perhaps the social interaction was a key factor that attributed to the feelings of enjoyment; making flashcards might have been just as enjoyable as another group activity.

Clearly, flashcard use has been shown to provide academic benefits. In general, the use of flash cards has positive effects on grade outcomes. Four hundred and fifteen Introductory Psychology students were surveyed concerning their use of flashcards to study for a course that issued three exams. Of the 415 students, 70% reported that they used flashcards for all three of their exams. These 70% scored significantly higher than the other 30% of students who either did not use flashcards, or who used flashcards to study for only one or two of the three exams (Golding, Wasarhaley, & Fletcher, 2012).

Alternative Electronic Resources

There are a few more possible grade-improvement resources that were identified. Online resources like YouTube, Google, and Wikipedia are ever-evolving, and students are using these online resources more and more to

complement their traditional ways of learning course content (Ashraf, 2009; Burke & Snyder, 2008; Head & Eisenberg, 2010).

Psychological Correlations of Academic Performance

Independent from the academic resources and behaviors of students mentioned above, some psychological reasons may also help explain why some students succeed while others struggle. Self-efficacy is someone's belief that he or she has the ability and skills necessary to achieve a certain level of performance (Bandura, 1977). Concerning academic self-efficacy, it reflects a student's level of confidence in their ability to perform well in school, and to achieve high marks on their assignments and exams. Self-efficacy, or a lack of self-efficacy, influences several different aspects of motivation and outcomes: how people set goals, how much energy is put toward those goals, and final performance outcomes.

Previous literature suggests that students with high academic self-efficacy fare much better than students with low levels of academic self-efficacy (Wang & Neihart, 2015). For example, Feldman and Kubota (2015) conducted a cross-sectional study and found that for a sample of 89 students, academic self-efficacy was a strong predictor of GPA. Other studies seem to agree: high academic self-efficacy correlates with academic success (Høigaard, Kovač, Øverby, & Haugen 2015), as well as minimizing risks of dropping out of school (Peguero & Shaffer, 2015).

Choi (2005) determined that to more accurately measure academic self-

efficacy, specific academic skills must be measured, instead of general self-efficacy. Owen and Froman's (1988) academic self-efficacy scale (Appendix A) has been determined to accurately measure what it claims to, by comparing academic skills in all students, and by assessing a range of specific academic capabilities (Papa, 2015).

Demographic Correlates of Academic Performance

In addition to the list of study resources and self-efficacy, demographic variables have also been shown to be related to academic performance. Three demographic characteristics were identified: gender, student generation status, and traditional versus adult learner status.

Gender Differences

Are there significant differences in the academic behaviors and outcomes of women and men? According to Cech's (2014) review, women have a cumulative, academic advantage over their male counterparts from middle school onward. On average, they simply score higher grades. This advantage, arguably, is the strongest factor relating to more women graduating college than men (Cech, 2014; Schwalbe, 2013).

Even though there are more women entering and finishing college, there are still pervasive stereotypes concerning the type of fields in which men and women succeed. For example, a common stereotype suggests that men succeed in math and engineering, women succeed in English and art (Gilbert, O'Brien,

Garcia, & Marx, 2015). Alon and Gelbgiser (2011) argued that specific college fields of study produce various educational environments, such as different grading norms expectations, social peer support, and academic intensity; all of which, shape the academic performance of men and women. This may explain gender variation of academic performance *between* fields of study, but what of gender variation of academic performance *within* fields of study?

In some cases, men may score higher than women, like on standardized tests with heavy mathematical content. Self-reports on standardized test preparation for the General Certificate of Secondary Education reveal that men report studying much less than women, yet they receive higher marks. Stereotype threat: performance being negatively affected by cultural expectations, may account for why high-achieving women fall short to high-achieving men in such situations (Rogers & Hallam, 2006). Perhaps gender-based stereotypes, in this case, boosted the confidence in men but inhibited the confidence in women.

This extra boost of confidence may not necessarily be beneficial to men in all cases, however. Sanders, Sander, and Mercer (2009) assessed 112 undergraduate psychology students, via interviews and surveys, concerning their study habits and academic outcomes over a 3-year period. Even though men reported being less motivated and less organized than their female peers, they did not perceive this as being an issue of concern. Regardless of the lack of motivation and the lack of organization, men initially reported having significantly higher self-esteem, higher expected grades, and higher expected academic

performance than their female peers. This confidence turned out to be false confidence; men scored lower in their coursework than women, and more men failed out of their courses than did women.

Regardless of fields of study or of academic outcomes, assessments of study behaviors reveal that women generally utilize stronger study skills than men (Fazal, Hussain, Majoka, & Masood, 2012; Slotte, Lonka, & Lindblom-Ylänne, 2001).

Adult Learners and Students with Children

Because of the time and financial demands that are required for children, families, and full-time jobs, adult learners and students with children have far less time allotted to their studies compared to traditional students. Compensating for these obstacles by using effective study strategies may be essential for their academic success.

Culp and Dungy (2014) defined the typical, or traditional, college student as being 18-22 years old, and without children. In this study, the study behavior of traditional college students will be compared to students belonging to two other groups: Adult Learners and Students with Children.

According to Culp and Dungsy (2014), adult learners and students with children (sometimes referred to as nontraditional or post-traditional students) currently make up more than a third of the student population at the national level, and 38% in the State of Utah (Utah System of Higher Education, 2015). These students are 24 years old or older, have a gap of 3-5 years in their

education, may be in the workforce while seeking a college degree, and may have children (Culp & Dungsy, 2014).

Self-reports from a sample of these students (H. E. Miller, 2015), via quantitative and qualitative interview data, revealed that the main stressors these students face are work demands, time management, family obligations, and striving to maintain motivation. These extra stressors, in addition to academic obligations, have negative impacts on retention rates for these students (Phillips, 2013). Some colleges have recommended concentration and study-skills programs to help these students focus their academic efforts (Anderson, 2009).

Even with all of these constraints, however, adult learners and students with children tend to have higher grades than their traditional-student counterparts (Hoyert & O'Dell, 2009). To obtain higher grades, do the study behaviors of non-traditional students differ from traditional students? There is a lack of published literature to explore this question.

First-Generation Versus Non-First-Generation Students

First-generation college students are defined as students whose parents or guardians have not obtained college degrees. Because these students' parents did not attend college, these students lack advantages from which their non-first-generation peers benefit. First-generation college students are usually in a lower socioeconomic status, since their parents work jobs that do not require college degrees. They are less familiar with college procedures and expectations, and they likely have less financial and social support from parents

and family (Francois, 2013; Ganuza Hoaglund, 2015; Mehta, Newbold, & O'Rourke, 2011; Reid & Moore, 2008).

Even though many of these students may think they are prepared for college before entering (Boden, 2011), they quickly realize how unprepared they are once college starts (Francois, 2013). The additional barriers from being a first-generation college student can affect all areas of a student's life. Even before leaving high school, these students are less likely than their non-first-generation peers to enroll in advanced placement (AP) or dual/concurrent enrollment courses in which they could have received college credits before high school graduation (Snyder, 2014). They also tend to perform worse on college placement exams (Boden, 2011). When they enter college, they are more likely to perform poorly in their courses, are less involved in college life, are less satisfied with their academics, are more likely to be placed on academic probation, and are more likely to fail out of college (Mehta et al., 2011; Zeisman, 2013). The college environment requires a level of student independence that first-generation students are not prepared for (Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012). Even if their non-first-generation peers were at an equal level of unpreparedness, they would at least have parents or guardians to turn to for guidance.

On an individual level, first-generation students develop coping strategies to attempt to overcome the odds. They report that in order to compete, they must invest more time and effort into their academics than their peers (Ganuza Hoaglund, 2015). Another coping strategy is to create social bonds with peers,

which has been shown to be important for academic success (Snyder, 2014). Fortunately, initial academic success increases self-confidence and can encourage these students to persist to graduation. Encouraging students' success during the first semester may be crucial (Francois, 2013).

Other strategies that could benefit first-generation students could be implemented by high schools and colleges. High school counselors could encourage students to enroll in AP courses, and should help students understand college expectations and financial aid procedures (Anderson, 2009; Snyder, 2014). While parents' level of education accounts for 2% of the variance of college-going beliefs for high school students, students' college knowledge accounts for up to 10% of the variance of college-going beliefs (Wisely, 2014).

In an effort to further help students, colleges can offer presentations to senior high school students to address expectation concerns. They can also continue beneficial programs like Freshmen Orientation courses during the summer before enrollment, in order to ease the transition into college (Zeisman, 2013).

Research Questions

In this study, there were expected possible differences in grades of first-generation students versus non-first-generation students. If, however, there were not significant differences in grades, we expected to find differences in studying strategies that first-generation students may develop as a coping strategy to compete with their non-first-generation peers.

Q_1: What is the prevalence rate of using each study strategy / resource to prepare for exams?

Q_2: Which strategy / resource, and level of self-efficacy, is most predictive of academic outcomes?

Q_3: Are there differences in prevalence between nontraditional and traditional students?

Q_4: Are there differences in prevalence between male and female students?

Q_5: Are there differences in prevalence between first-generation and non-first-generation students?

CHAPTER III

METHODS

Participants and Setting

The participants for the study were drawn from undergraduate university students from three General Psychology (PSY 1010) courses at Utah State University (USU), in the Spring, 2016 semester. The course is a general education course that fulfills a social science requirement. The classes include both male and female undergraduate students, both traditional and non-traditional students, and both first-generation and non-first-generation students.

Selection Criteria

The subjects of this study were purposively chosen because the Introduction to Psychology course is a general elective course which many students enroll in, regardless of their major / background. Age was limited to 18 and older.

Recruitment

Volunteers for this study were recruited from the Introduction to Psychology courses at USU, Logan, Utah. By permission from the instructors, we were given a few minutes at the beginning of classes to present the details of participating in the study to the students. It is common at USU for Introduction to Psychology instructors to require “lab credit” (usually 10 total lab credits) to students for participating in research. Each time a student participated in the

surveys, they were allotted .5 lab credits; many other alternatives to participation in this particular study were available to students.

Informed Consent Process

A letter of informed consent appeared at the beginning of each of the online surveys. The informed consent stated that the study will be voluntary, confidential, and that all results will be kept in a locked office, on a password-protected computer.

Demographics of Participants

A total of *N* = 148 participants, out of 696 possible students (21.3%) responded to the survey (*N* Class 1 = 238, *N* Class 2 = 207, *N* Class 3 = 251). A complete detailed list of the self-reported demographics can be found in Table 1, which excludes missing responses. Most of the student participants were women (*n* = 89; 60.1%). The most common ages were 18- and 21-year-old students (*n* = 114; 75.7%) and the mean age was 20.5 (*SD* = 2.9). The majority of the students were freshmen (*n* = 75; 50.7%), and traditional students, meaning, 25 years or younger, and do not have children (*n* = 133; 89.9%). Twenty-five of the participants were first-generation college students (16.9%). Additionally, most students were employed (*n* = 92; 62.2%), and lived in off-campus housing (*n* = 73; 49.3%).

Procedures and Materials

Students from several Introduction to Psychology sections of the Spring,

Table 1

Demographics of Participants (N = 148)

Characteristics	*n*	% of total
Gender		
Women	89	60.1
Men	51	34.5
Age group		
18	26	17.6
19	36	24.3
20	20	13.5
21	30	20.3
22	9	6.1
23	12	8.1
24-41	7	4.7
Traditional student status		
Traditional student	133	89.9
Non-traditional student	7	4.7
First-generation student status		
First-generation college student	25	16.9
Non-first-generation college student	114	77.0
Year in college		
Freshman	75	50.7
Sophomore	45	30.4
Junior	14	9.5
Senior	6	4.1
Housing type		
With parents	18	12.2
On campus	48	32.4
Off campus	73	49.3
Employment		
Not employed	48	32.4
1-10 hours per week	14	9.5
11-20 hours per week	43	29.1
21-30 hours per week	20	13.5
31-40 hours per week	11	7.4
40+ hours per week	4	2.7

2016 semester, were assessed concerning their study habits and study resources. Students took four exams throughout this course. After each exam, students voluntarily took a survey (see Figure 1) which inquired about which resources they used to prepare for that exam, and how much time they spent using each resource to prepare (they took the survey within 24 hours of each examination day to ensure valid responses). Before the first exam and survey, the researcher informed students about the survey and the lab credits incentive. As students left the examination rooms, they were reminded about the surveys via Canvas (the university's course-management software) announcements, which also provided online links to the survey.

After the first survey phase, students were automatically prompted (via email addresses provided in the first survey) to take the following, three phases of the survey, later in the semester. Due to a lack of participants for the first

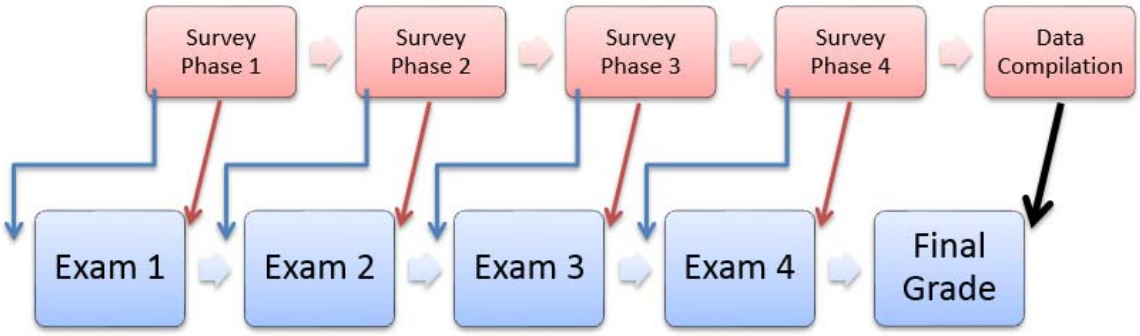


Figure 1. Survey phases aligned with course exams. Red arrows represent when the surveys were administered to the students: after each exam. The blue arrows represent the period of time when students studied before each exam and how each survey phase will assess study behaviors during those time periods. After the semester ended and the final grades were entered, data compilation and assessment commenced.

phases of the study. Therefore, the consent form appeared at the beginning of phase, new students were allowed to participate in the study at subsequent every survey. Only those agreeing to the consent form were allowed to access the remainder of the surveys.

These surveys assessed many possible predictors of the course grade: study behaviors in regard to resources used, time spent, and study intensity for each exam, academic self-efficacy scores, academic performance, and demographics data. Specific details of the set of explored variables are addressed in the Results section.

The first section of the survey displayed the consent form which explains the purpose of the study, addresses the rights of the participants, and clarifies anonymity and confidentiality of the information. To participate in any phase of the study, students were required to provide an electronic signature, at the beginning of each survey phase, indicating their agreement to the consent form.

When each survey began, students were asked which study resources were used to study for the most recent exam. Logic paths were integrated into the Qualtrics survey, so participants would be asked further questions about certain resources only if they indicated that they used those resources. For example, if a student indicated that she used only the textbook to prepare for the exam, then further questions will only address textbook use, and she will not see further questions about other resources like flashcards (see Appendix A for the complete instrument). This was designed to save students time and to avoid invalid responses due to response fatigue.

Students were also asked to report their academic self-efficacy scores via the CASES measure. The CASES measure is a 33 item questionnaire which evaluates students' confidence in their academic abilities. An initial assessment of the reliability of the measure was estimated to be at an alpha of .85 (Owen & Froman, 1988).

The surveys also gathered identifying information from the participants in order for researchers to collect accurate academic performance data (grade in this course, USU GPA, and ACT scores). Participants who agreed to the consent form, agreed to allow the researchers to access to their information. Other demographic information was also gathered to determine any possible patterns among first generation students versus non-first generation students, age, gender, year in college, etc.

These surveys were administered after each of the exams throughout the semester (four exams). Taking the survey should have taken approximately 10-15 minutes each time. Each time participants took the surveys, they answered questions based on how they studied for that specific exam, since taking the previous exam.

The nature of the study required that students agreed to allow their university ID numbers and grades to be included in the data collection. This was necessary to accurately compare their responses to their actual grade in this course, GPA, etc. Students were informed that the researchers would be the only ones who will have access to this data, which were stored in a secure location. Once the data were complete for all four exams and the final course grade, the

identifying school ID numbers were no longer required, and they were replaced with anonymous, randomly generated identification numbers.

Demographic Information

For this study, we assessed common demographic variables including: gender, age, first-generation college student status, year in college, traditional versus adult learner student status, how many children they have, housing type, and the number of semesters taken.

CHAPTER IV

RESULTS

Results are presented in four sections: (1) descriptive analysis, (2) analysis of academic behavior and self-efficacy changes over time, (3) analysis of participant group differences, and (4) bivariate correlations between the actual course grade compared to all other variables, and predictors of students' course grade.

Descriptive Statistics

Missingness

One of the original objectives of this study was to assess any changes of students' study behaviors over the course of a semester. Because there were four exams in these courses, this study was designed to have four phases which aligned with the exams. Below, Tables 2 and 3 show how many students participated in each phase, and in how many phases.

Table 2

Student Participation Count Per Phase

Phase Number	*n*
1	72
2	77
3	100
4	57

Table 3

Total Phases Participation Count

Number of phases participated in	*n*	% of total
Only one phase	57	40.4
Only two phases	32	22.7
Only three phases	28	19.9
All four phases	24	17.0

Students were encouraged to participate in as many phases as possible, if not all phases. Seventeen percent of the participants completed all four phases, and 40.4% completed only one of the four phases. The remaining students participated in two or three phases, some back-to-back, some sporadic. Due to so much missing data, scores were collapsed across phases for each study behavior variable and self-efficacy score, regardless of how many phases they participated in. These average scores allowed each student to be represented in the study, and also yielded the largest sample size. This strategy seems statistically justifiable, because the repeated-measures assessments of students who completed all four phases, resulted in almost no significant changes of study behaviors over time (save for lecture slides study habits, addressed in the results). So, a student's average score is meant to represent how they scored, or would have scored, during any phase throughout the semester.

Power

We assessed the effects of 11 study resources and three grouping

variables on academic outcomes. In order to obtain a statistical power of .8, a $p <$ .05, and to detect a large effect size (.35), we required at least 59 participants for 11 predictors. For 14 predictors, we require at least 66 (see Appendix B). To detect a medium effect size (.15), we would require 122, and 125 participants, respectively. Obtaining enough participants to detect small effect sizes (.02) would require nearly 900 students, and that number of participants may be beyond the scope of this study. Fortunately, there were 148 total students that participated in this study. However, not every student participated in every time point. As previously mentioned, due to a large amount of missing data, students' scores were averaged across all time points, regardless of how much they participated.

Academic Performance of Participants

Considering academic performance, most students had GPAs in the 3.0 – 3.49 range (n = 46; 31.1%). Eighty-one students (54.7%) received an A or B range grade, 52 (35.1%) received a C or D range grade and the remaining 12 participants (8.1%) failed or withdrew their Psychology 1010 course. The average ACT score was 24.0 with a standard deviation of 4.4. Additional details of the verified academic scores are seen below in Tables 4 and 5, which excludes missing data due to insufficient identifying information.

Study Resources Used by Participants

Students were asked to identify the ways they studied for course exams. Not all study variables were measured on the same scale. For example, student

Table 4

Academic Performance of Participants

Variables	*n*	% of total
GPA (*M* = 3.0)		
3.5 - 4.0	37	25.0
3.0 - 3.49	46	31.1
2.5 - 2.99	33	22.3
2.0 - 2.49	20	13.5
1.99 or Below	11	7.4
ACT score (*M* = 24.1)		
28 - 32	31	22.0
24 - 27	39	27.7
20 - 23	37	26.2
16 - 19	25	17.7

Table 5

Final Introduction to Psychology Course Grades

Grade (*Mean* = B- / C+)	*n*	% of total
A	17	11.5
A-	15	10.1
B+	14	9.5
B	15	10.1
B-	20	13.5
C+	13	8.8
C	16	10.8
C-	6	4.1
D	7	4.7
D-	10	6.8
F	12	8.1

instruction sessions were measured by how many sessions were attended; study of the textbook was measured both in hours studied, and in percentage of the total content that was reviewed. For all study variables, interval and ratio scales were implemented. The large standard deviations indicate a large range and variation of study habits between students. On average, students reported attending about 81% of their class sessions. While they reported using their textbook and their notes as the preferred resources to spend their study time (3.3 hours for both), they reported taking notes on 77% of the course content, and reported reviewing less than half of the total textbook content. This suggests that students are selective in how they spend their study time, identifying the important information from lectures and the textbook, rather than taking verbatim notes, or reading the textbook word-for-word. Additional descriptive statistics are outlined in more detail in Tables 6, 7, and 8 (shown later in this chapter).

Because of the large standard deviations for hours spent studying the textbook and for reviewing notes, distributions of those scores are displayed as histograms in Figures 2 and 3.

Table 6

Descriptive Statistics for Study Variables

Percent-measured study variables between exams	*n*	Mean	*SD*
Percentage of class attendance	134	81.5	28.9
Percentage of textbook reviewed	133	49.2	34.6
Percentage of course content students took notes on	130	77	31.2
Percentage of lecture slides reviewed	135	31.7	37.5

Table 7

Descriptive Statistics for Study Variables

Count-measured study variables	*n*	Mean	*SD*
Hours spent studying textbook	139	3.3	4.9[a]
Hours spent reviewing notes	137	3.3	4.3[a]
Hours spent reviewing lecture slides	139	1.2	2.6
Hours spent studying as a peer group	139	.5	1.2
Hours reviewing study guide	140	1.7	2.1
Hours reviewing flash cards	139	.9	2.2
Hours studying course electronic resources	140	1.2	1.8
Hours studying course-alternative electronic resources	140	.8	1.9
Number of attended student instruction sessions	140	1.1	1.7
Number of times studied as a peer group	140	.3	.7
Number of people in peer group	32	2.9	1.7

[a] These standard deviations are addressed below.

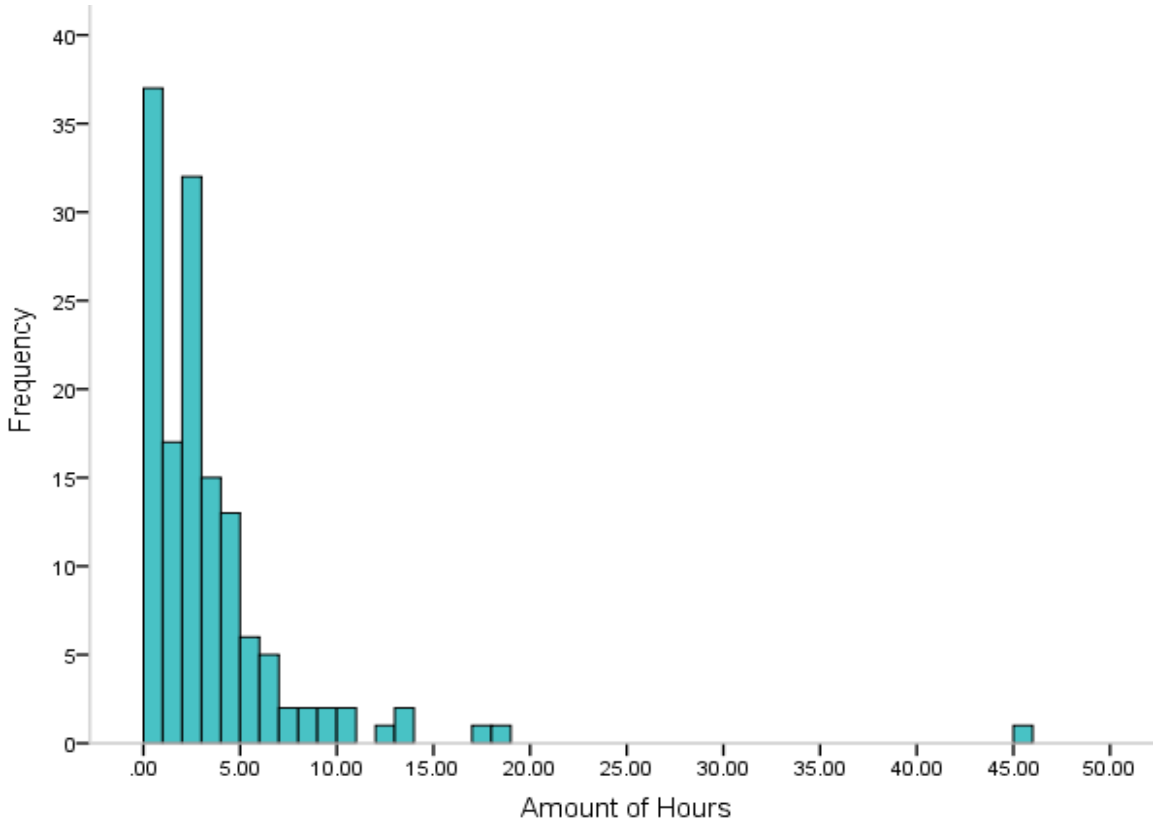


Figure 2. Frequency distribution of hours spent studying the textbook.

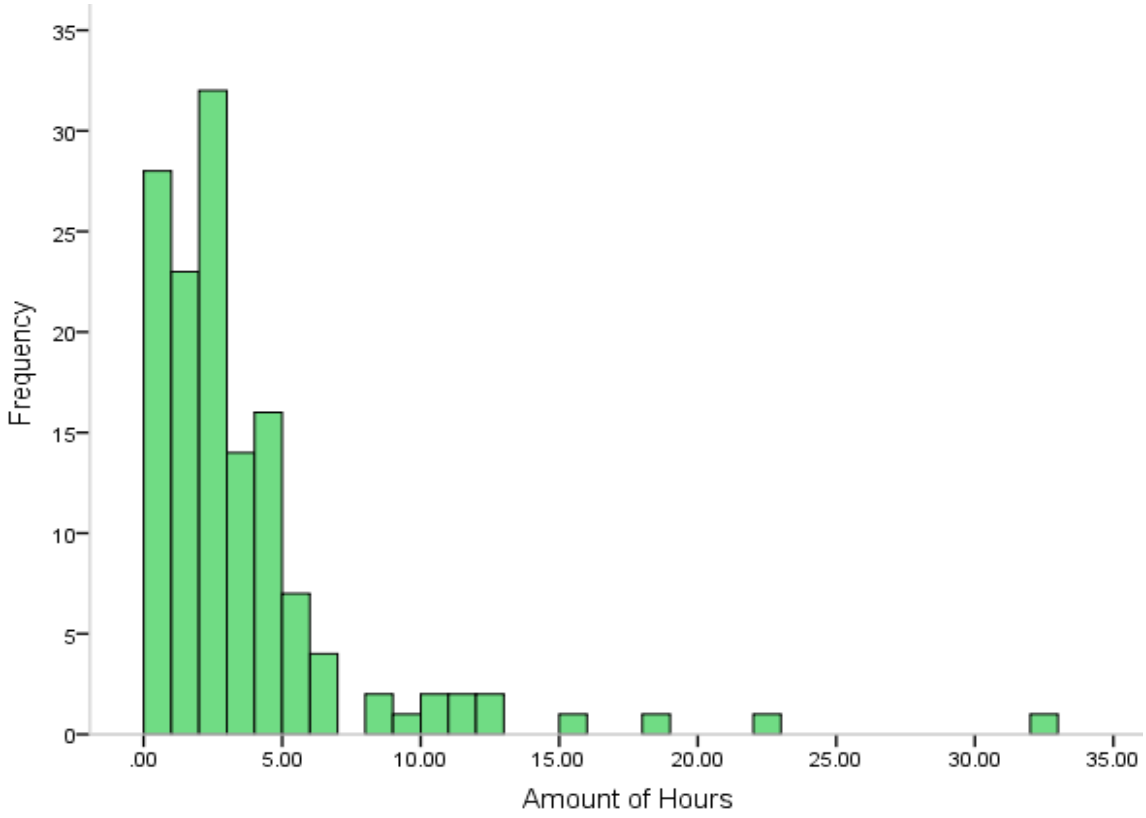


Figure 3. Frequency distribution of hours spent reviewing notes.

Academic self-efficacy scores of participants. Students were asked to complete the CASES measure, which assesses academic self-efficacy (Owen & Froman, 1988). The items with the highest self-reported scores of mean confidence were confidence in using a computer (*M* = 4.4; *SD* = .8), and confidence in attending class regularly (*M* = 4.2; *SD* = .9). The items with the lowest self-reported scores of mean confidence were confidence in running for student government office (*M* = 2.5; *SD* = 1.1), and confidence in challenging a professor's opinion in class (*M* = 2.4; *SD* = 1.1). The mean scores and standard deviations of each item are listed in Table 8.

Table 8

CASES Self-Efficacy Items Scores

Item: Confidence in:	*n*	*M*	*SD*	*Min*	*Max*
Taking well-organized notes during a lecture.	141	4.0	1.0	1.0	5.0
Participating in a class discussion.	141	3.2	1.0	1.0	5.0
Answering a question in a large class.	141	3.0	1.2	1.0	5.0
Answering a question in a small class.	140	3.8	.9	1.0	5.0
Taking “objective” test (multiple-choice, T-F, matching).	141	4.2	.8	1.0	5.0
Taking essay tests.	140	3.3	1.0	1.0	5.0
Writing a high-quality term paper.	140	3.5	1.1	1.0	5.0
Listening carefully during a lecture on a difficult topic.	141	3.9	.9	1.5	5.0
Tutoring another student.	141	3.2	1.0	1.0	5.0
Explaining a concept to another student.	141	3.7	.9	1.0	5.0
Asking a professor in a class to review a concept you don’t understand.	141	3.1	1.1	1.0	5.0
Earning good marks in most cases.	140	3.8	.9	1.0	5.0
Studying enough to understand content thoroughly.	141	3.7	.8	1.7	5.0
Running for student government office.	141	2.5	1.1	1.0	5.0
Participating in extracurricular events (sports, clubs).	140	3.7	1.1	1.0	5.0
Making professors respect you.	141	3.7	.9	1.0	5.0
Attending class regularly.	141	4.2	.9	1.0	5.0
Attending class consistently in a dull course.	141	3.7	1.1	1.0	5.0
Making a professor think you’re paying attention in class.	140	3.9	.8	1.5	5.0
Understanding most ideas you read in your tests.	141	3.9	.8	1.0	5.0
Understanding most ideas presented in class.	141	4.1	.7	2.0	5.0
Performing simple math computations.	141	4.1	1.0	1.0	5.0
Using a computer.	141	4.4	.8	1.3	5.0
Mastering most content in a math course.	141	3.7	1.1	1.0	5.0
Talking to a professor privately to get to know him or her.	141	3.2	1.1	1.0	5.0
Relating course content to material in other courses.	140	4.0	.8	1.0	5.0
Challenging a professor’s opinion in class.	141	2.4	1.1	1.0	5.0
Applying lecture content to a laboratory session.	140	3.7	.8	1.0	5.0
Making good use of the library.	140	3.7	.9	1.0	5.0
Getting good grades.	141	3.9	.9	1.0	5.0
Spreading out studying instead of cramming.	141	3.2	1.1	1.0	5.0
Understanding difficult passages in textbooks.	140	3.4	.9	1.0	5.0
Mastering content in a course you’re not interested in.	141	3.2	1.0	1.0	5.0
Confidence Mean Scores	141	3.6	.5	1.0	5.0

Note. Each of the 33 items are scored on a Likert scale from 1-5 (1= “very little confidence”; 2= “little confidence”; 3= “neutral”; 4= “some confidence”; 5= “quite a lot of confidence”).

Study and Preparation Habits: Change Over Time

In order to identify overall statistically significant differences in the study behaviors and academic self-efficacy scores for the four exams, a repeated-measures ANOVA was conducted on the scores of students who participated in all four time points throughout the semester (n = 22). Post Hoc analyses revealed only one variable to have statistically significant differences when comparing the four time points: self-reported time spent reviewing lecture slides.

Studying Lecture Slides

Throughout the semester, students remained relatively constant in their level of self-reported study intensity (both percentage of content, and hours spent) for the various exam preparation resources. While there was variation between students' self-reported study habits and efficacy scores, there was almost no variation within students' self-reported scores over time. As mentioned, the percentage of the available lecture slides that students reported to have studied for each exam (The professors made all of their lecture slides available to the students; the percentage of the slides which were reviewed were assessed.) was the only study behavior that significantly changed over time, $F(2.048, 36.856) = 3.276$, $p < .05$, $\eta^2 = .154$. While there was an overall statistically significant F value, Bonferroni adjustments for multiple comparisons resulted in no significant pairwise comparisons between any of the four time points. However, the greatest change (p = .056) was between times one and two. Overall Means are addressed in Figure 4.

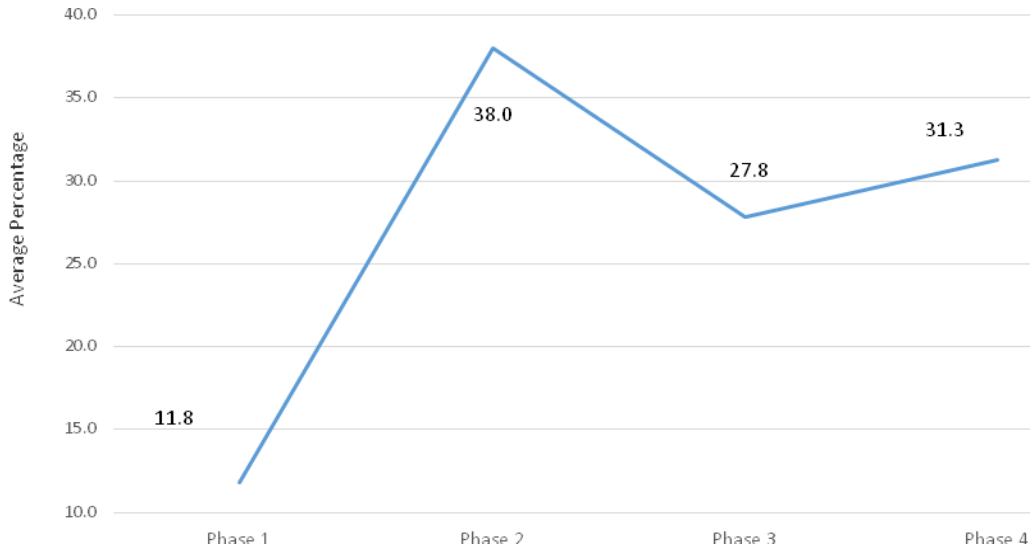


Figure 4. Mean percentage scores of lecture slides reviewed. Of the available lecture slides, these were the percentages of the slides which were reviewed, on average, at each time point.

Additional, Nonsignificant Changes Over Time

When comparing the four phase time points to each other, there was an overall, general pattern: student participants began the semester with relatively high scores on the following academic behaviors: attending class, reviewing the textbook, and reviewing notes (see Figures 5-7). They also had average self-efficacy scores (Owen & Froman, 1988). Because there were no statistically significant changes for any of these variables throughout the semester, it could be assumed that students generally do not alter their study behaviors, regardless of their current course grade.

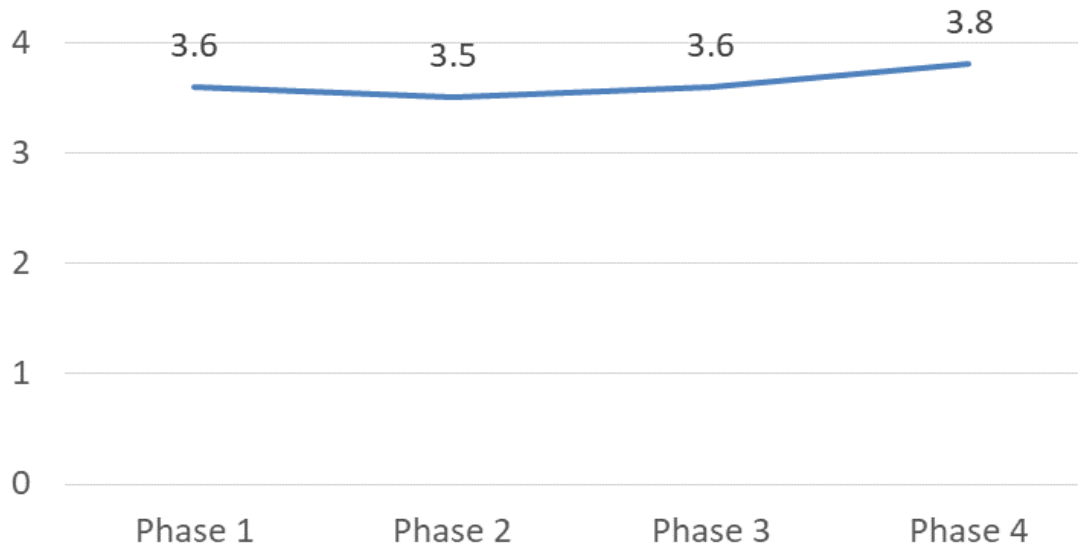
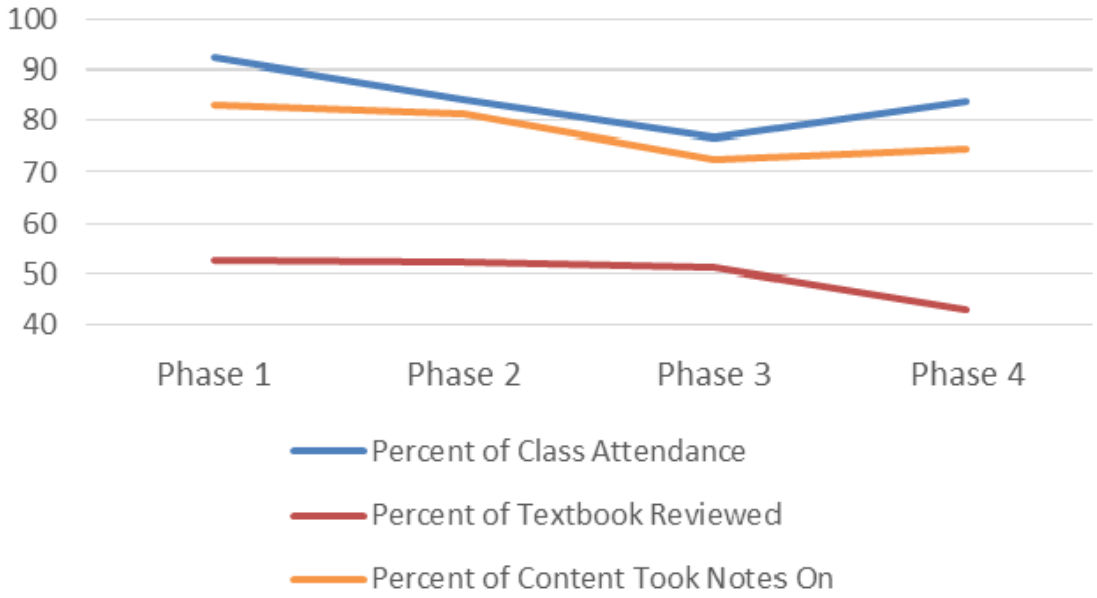


Figure 5. Students' average CASES scores at each time point.



Note. Slides data previously addressed in *Figure* 2.

Figure 6. Students' percent-measured variables average scores at each time point.

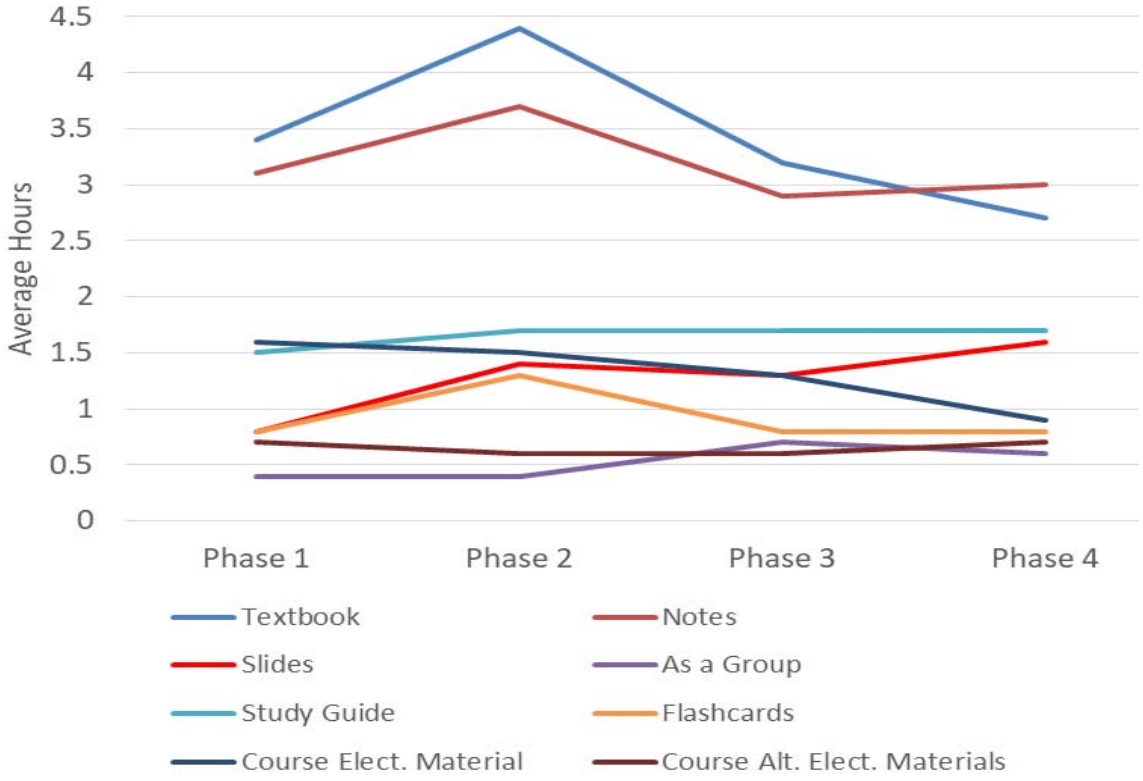


Figure 7. Students' average hours-measured variables average scores at each time point.

Group Differences

Differences in self-reported study behaviors, academic self-efficacy, and academic performance scores were assessed across group comparisons of gender and first-generation student status. There were not enough non-traditional students (*N* = 7, 4.6% of total) to conduct group comparison analyses between traditional and non-traditional student.

Analysis of Gender Differences

Independent samples *t* tests were conducted to determine if differences

between men and women were statistically significant on self-reported academic study behaviors, academic self-efficacy, and academic performance. There were multiple statistical significant differences at $p < .007$ (Bonferroni adjustment for multiple comparisons) level between male and female students. The patterns of these findings suggest that on average, women reported that they study almost twice as much as men, both in hours spent, and in the percentage of course content reviewed. The range of Cohen's d's, from .4 - .6 are moderate effect sizes, which indicate that women scored about a half standard deviation higher than men (opposite direction for age). Nonstatistically significant results were omitted from the Table 9.

Analysis of Generation Status Differences

Independent sample *t* tests were conducted to identify statistical significant differences between first-generation college students (i.e., students whose parents or guardians have not obtained college degrees) and non-first-generation college students, concerning their self-reported academic study behaviors, their academic self-efficacy, and their academic performance. There were multiple statistical significant differences at $p < .0125$ (Bonferroni adjustment for multiple comparisons) level between students from these two groups. On every measure, first-generation college students scored lower than non-first-generation students. The range of Cohen's d's, from .4-.7 are moderate to moderately high effect sizes, which indicate that non-first-generation students scored about a half standard deviation higher than first-generation college

Table 9

Gender Differences

Variable	Gender	*n*	Mean	*SD*	*t*	*df*	Cohen's *d*
Hours reviewing textbook	Men	47	2.1	1.9	-2.6*	116	.4
	Women	87	3.9	5.9			
Hours reviewing notes	Men	46	2.1	2.4	-2.8†	129	.5
	Women	86	3.9	4.9			
Percentage of slides reviewed	Men	45	23.2	31.4	-2.1*	108	.4
	Women	85	36.8	39.4			
Hours reviewing slides	Men	47	.5	.8	-3.1†	107	.5
	Women	87	1.6	3.1			
Hours reviewing study guides	Men	47	1.1	1.4	-2.8†	131	.5
	Women	87	2.0	2.4			
Hours reviewing flash cards	Men	47	.3	.6	-3.6†	102	.6
	Women	87	1.4	2.7			
Age	Men	51	21.6	2.4	3.5†	138	.6
	Women	89	19.8	3.0			

Note. All study behavior variables, academic performance (from Tables 4 - 7) and overall CASES scores were assessed in these comparisons, in order to identify variables with non-significant findings.

*$p < .05$, ** $p < .01$, †$p < .007$ (deemed significant after the Bonferroni adjustment).

students, the highest (.7), for overall GPA. Nonstatistically significant results were omitted from the Table 10.

Interaction Effects Between Gender and Generation Status

A 2 (gender: women, men) by 2 (generation status: first-generation, non-first-generation) ANOVA was conducted in an attempt to detect statistical significant interaction effects between these two demographics. The same

Table 10

Generation Status Differences

Variable	First-generation status	*n*	Mean	*SD*	*t*	*df*	Cohen's *d*
Hours reviewing flash cards	First-generation student	25	.4	.7	-2.6†	125	.4
	Non-first-generation student	109	1.1	2.5			
Overall CASES score	First-generation student	25	3.4	.7	-2.2*	137	.4
	Non-first-generation student	114	3.7	.5			
Overall Current GPA	First-generation student	25	2.6	.8	-3.3†	137	.7
	Non-first-generation student	114	3.1	.6			
Final Psychology 1010 Grade	First-generation student	25	5.2	3.0	-2.5*	135	.6
	Non-first-generation student	112	6.9	3.0			

Note: All study behavior variables, academic performance (from Tables 4 - 7) and overall CASES scores were assessed in these comparisons, in order to identify variables with nonsignificant findings.

*$p < .05$, †$p < .0125$ (deemed significant after the Bonferroni adjustment).

dependent variables addressed in Tables 4 through 8, were assessed in this analysis as well. There were no statistically significant interaction effects found.

Predicting Performance

Correlations were calculated to determine strength and direction of the relationships among continuous variables, which measured both frequency and intensity of self-reported resource use. These were compared to the outcome variable: students' final psychology 1010 course grade, as seen in Table 11.

Correlated Study Behaviors

An additional Pearson's Correlation matrix was created to asses which study behaviors related to each other. Results are seen below in Table 12.

Table 11

Pearson Correlation Matrix: Variables Correlated with Academic Success

Variables	Final course grade	Class attendance	Percentage of course content taken notes on	Number of SI sessions attended	CASES average score	Employment hours	GPA
Class attendance	.416***						
Percentage of course content taken notes on	.313***	.718**					
Number of SI sessions attended	.197*	.210*	.196*				
CASES Score	.517***	.171	.268**	.054			
Employment Hours	-.193*	-.076	-.076	-.214*	.071		
GPA	.759***	.340**	.288**	.144	.399**	-.099	
ACT score	.381***	-.031	-.029	-.235**	.280**	.005	.394**

Note: Due to some missing data, *n* ranged between 127 and 145 for correlation items. All study behavior variables, academic performance (from Tables 4 - 7), and overall CASES scores were assessed in these comparisons, in order to identify variables with non-significant findings.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 12

Pearson Correlation Values Matrix: Study Variables Correlated with Each Other

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Percentage of class attendance													
2. Percentage of textbook reviewed	.015												
3. Hours spent studying textbook	.000	.502***											
4. Percentage of course content taken notes on	.718	.103	.095										
5. Hours spent reviewing notes	.157	.136	.662***	.299**									
6. Percentage of PP slides reviewed	-.086	.085	.108	.076	.262**								
7. Hours reviewing PP slides	-.004	.147	.573***	.086	.710***	.582***							
8. Number of SI sessions attended	.210*	.078	.263**	.196*	.370***	.060	.310***						
9. Number of times studied as a peer group	.087	.043	.026	.041	.044	.088	.055	.034					
10. Hours spent studying as peer group	-.065	.100	.061	.003	.074	.134	.092	.071	.809***				
11. Number of people in peer group	-.083	.232	.413*	-.042	.339	.075	.376*	.214	-.108	.027			
12. Hours reviewing study guides	-.148	.186*	.426***	-.047	.423***	.000	.143	.125	.077	.148	.168		
13. Hours reviewing flashcards	-.094	.191*	.549***	.020	.524***	-.058	.247**	.187*	.051	.087	.353*	.620***	
14. Hours using course electronic resources	-.066	.140	.191*	-.083	.061	-.092	.042	.140	.034	.026	.056	.108	.096

Note. Due to some missing data, *n* ranged between 30 and 140 for correlation items. Numerical values were assigned to each variable in order to fit them in the table. The course alternative electron resources variable did not correlate with any other variables and was omitted from this table.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Variables that Statistically Significantly Predict the Final Course Grade

A stepwise, multiple linear regression model was created using the items in the correlation matrix above. Results are shown in Table 13.

In a step-by-step method, non-significant variables were removed until the model contained percentage of self-reported class attendance, overall CASES score, and overall GPA. All of these variables predicted the constant outcome variable, final course grade. At this point, other continuous variables were added and removed from the model, one-by-one, in a stepwise method, in attempts to find other variables which were predictive of the final course grade. This resulted

Table 13

Coefficients Variables Resulting from Multiple Regression Analysis

	Unstandardized coefficients		Standardized coefficients	
Predictors	B	Std. Error	Beta	*t*
Constant	-7.17	1.20		-5.99***
Class attendance	.02	.01	.15	2.70**
CASES Score	1.36	.34	.24	4.05***
Employment hours	-.24	.12	-.11	-2.04*
Current GPA (as of Spring, 2016)	2.71	.29	.59	9.39***

Note. All study behavior variables, academic performance (from Tables 4-7) and overall CASES scores were assessed in these comparisons, in order to identify variables with non-significant findings.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

in identifying one other predictive variable in our measure, the amount of self-reported hours employed.

The final regression equation was calculated, $F(4, 122) = 58.266$, $p < .001$, with an adjusted R^2 of .645. Participants' predicted final course grade is equal to the constant + .15(Percentage of Class Attendance) + .24(CASES Average Score) + .59(Overall GPA) - .11(Employment Hours Worked per Week). Percentage of class attendance is measured 0%-100%; CASES average scores are measured 1-5, where 5 = quite a lot of academic confidence; GPA is measured in its raw form (0.0 - 4.0); employment Hours Worked per Week are measured in increments of 10 hours per week: 1 = unemployed, 2 = 1-10 hours per week, 3 = 11-20 hours per week, etc.

CHAPTER V

DISCUSSION

Academic performance is important to student retention in college (Stinebrickner & Stinebrickner, 2014). In order to help students be more successful in their academics, it is important to assess academic behaviors, academic self-efficacy, and previous academic performance of students. This data will help inform students of best academic practices that will increase their likelihood of academic achievement. In this discussion section, overall descriptive findings will be addressed. Following those, group differences (gender and student generation status) will be addressed concerning study habits, study resources, and academic performance, as well as predictive variables, and changes of study behaviors over time.

Overall Descriptive Findings

Based on the findings on this study, I have several conclusions. Most Introductory Psychology students at USU reported attending all class sessions throughout the semester. They also reported taking notes on 77% of the total course content, on average. In preparation for each of their exams, they reported that they studied their notes for 3.3 hours on average (with no significant changes over time), and reported studying about half (M = 49.2%) of the content in their textbooks for an average of 3.3 hours. Even though this study assessed many other study resources, very few students reported engaging in those other

resources for their exam preparations. These findings suggest that most undergraduate college students continue to rely on just a few study methods and resources: taking and studying notes, and reviewing the textbook. Additionally, these study habits maintain relatively stable throughout the semester. While there is a slight change in study behavior (see Results), it's likely that an individual's study habits will not *significantly* change throughout the semester, regardless of whether the student has an A or an F in a class.

Findings on Differences Between Genders

When comparing men and women, there were not statistical significant differences in the overall academic performance. This may seem contrary to Cech's (2014) and Schwalbe's (2013) findings that women score better grades in college, or even Gilbert's et al (2015) findings that women score higher than men in humanities and social science fields like psychology. However, women did score significantly lower than men on several self-reported efficacy items. Therefore, similar course grades may be the result of stereotype threats (Rogers & Hallam, 2006), or perhaps, women felt the need to study more hours and more course content than men, to compensate for their lower scores of reported self-efficacy (Fazal et al., 2012; Slotte et al., 2001).

For every statistically significant difference between male and female students regarding their self-reported study behaviors, men reported using far fewer study resources than did women. When men and women reported using the same study resources, women reported studying at roughly twice the amount

of time compared to men, which supports previous findings. Fazal et al. (2012) found that women were more likely to use more study resources than men, and were also more effective in how they used the resources. Slotte et al. (2001) also found that female students use overt study strategies like note taking much more than male students.

Although there was not a statistically significant difference between men and women on the overall reported CASES scores (academic self-efficacy), assessing each item in the efficacy measure showed that men scored statistically significantly higher than women on several academic reported self-efficacy items. These items concerned their confidence in active, verbal participation in classes and interactions with the professor. The only item in which men scored lower than women was in their ability to compile well-organized notes. While there was not a statistically significant difference in the outcome variable, the final course grade, between men and women, there may be a tendency to achieve similar final grades using different strategies, because both academic confidence and study behaviors affect a course grade. Reflective of previous findings mentioned above, female students may feel the need to study twice as long as males due to their lower scores on several academic self-efficacy items. Perhaps the lack of academic self-efficacy women may have, may be compensated for by studying longer than men.

Findings on Differences Between Student Generation Status

While there are some significant differences between male and female

students. There are even more dramatic differences, which support previous findings, between first-generation and non-first-generation students. For example, non-first-generation college students reported statistically significantly higher academic self-efficacy scores (Francois, 2013; Ganuza Hoaglund, 2015; Mehta et al., 2011; Reid & Moore, 2008). In general, this population of students report having more confidence in their academic abilities. They also reported studying longer, and they had higher academic performance, not only in the psychology course, but also with their overall GPA (Mehta et al., 2011; Zeisman, 2013). Additionally, in virtually all statistically significant findings, first-generation college students scored lower in self-reported study behaviors (both in resources used, and in time spent studying), itemized academic self-efficacy scores, and academic performance. These findings strongly support previous research. For example, Boden (2011) found that even though first-generation students perceive themselves as being just as prepared for college as non-first-generation students, they score significantly lower on placement exams than their peers. Mehta et al. (2011) also found that first-generation students have a lower GPA, which may be due to less social and financial support and less satisfaction with college experiences. Zeisman found that negative experiences like academic probation act as compounding factors for first-generation students. Of those placed on academic probation, first-generation students are more likely to drop out of school, while non-first-generation students are more likely to seek academic guidance. All of these findings reflect my own: first-generation college students struggle more in almost every area of academia, compared to their non-

first-generation peers.

Another interesting finding between the interactions of these two groups was that first-generation female students were more likely to currently have more children compared to students in the other three groups, even though female students were, on average, about 2 years younger than male students. These findings may suggest that an extraneous variable, like raising children, may be a unique, additional struggle for first-generation female students compared to all other students, and this variable should be explored further in future studies.

Findings on Predictive Variables

After assessing these group differences, a correlation matrix and a linear regression model was used to identify variables that correlate with, and predict students' overall academic performance. Several variables were shown to support previous findings of correlating with, and predicting academic performance: previous academic performance, attending class (Credé et al., 2011) and student instruction sessions (Dawson et al., 2014), taking notes (Kobayashi, 2005), working less (Phillips, 2013), and having higher academic confidence (Wang & Neihart, 2015) correlated with, and predicted a higher course grade. In this study, a correlation matrix calculated that previous academic performance scores like ACT and GPA correlated with the final course grade. Additionally, self-reported academic behaviors like class attendance, taking and reviewing notes, and attending student instruction sessions also correlated with the final grade. Finally, the overall academic self-efficacy CASES

score correlated with the final grade as well.

A stepwise multiple linear regression model was conducted to determine which of the study resources, self-efficacy, and academic performance variables were predictive of the final course grade. Of all the variables analyzed, and of all the variable combinations, the model with the best fit suggested that high class attendance, a high academic self-efficacy score, a higher GPA, and being employed fewer hours were all significant predictors of achieving a higher final course grade.

These findings suggest that, even though there are several predictors of course grades, some more predictive than others, students need to understand that academic success results from a complex combination of many variables. Even though having high academic confidence, attending class, working less, taking notes, and attending extra study sessions are all important, it's likely not enough to employ just any one of those strategies and expect high grades. Students should approach their academic success in many different ways.

Limitations and Future Directions

Ideal circumstances would have resulted in a robust sampling size of the same students across all four time points. The rate of missing data was quite high for this study. With a much larger sample size, a repeated-measures ANOVA may have revealed valuable information about how individual students' study behaviors, academic self-efficacy, and academic performance change throughout the semester. For this current study, there were a lot of missing

responses; only 22 students (14.9%) participated for all four time points. This may have resulted in an incomplete view of how students change their behaviors throughout the semester; perhaps students who are willing to participate in all four phases of this survey may have academic characteristics which do not reflect the typical student. Future replication studies may need to be slightly modified in the design. To obtain more results for repeated measures, future researchers might consider measuring only two time points (beginning of the semester, and end of the semester); it would be more likely that students will participate in only two measures, rather than four times throughout the semester.

Another limitation of note is that the vast majority of the students enrolled in the Spring, 2016 Introductory Psychology course were traditional students (89.9%). These findings differ from overall student statistics, specific to Utah State University, which showed a traditional student rate of 62% (Utah System of Higher Education, 2015).

Because very few academic behaviors, self-efficacy scores, and measures of academic performance significantly changed throughout the semester for our sample of 22 students, available scores were averaged for all students, regardless of their response rate, to assess overall group differences. This seemed an appropriate method to ameliorate for the large amount of missing data.

Having access to the actual exam scores would have provided a more specific outcome variable, rather than only relying on the final course grade. Although the consent forms that student participants signed granted researchers

with that permission, obtaining such a report would have been a great cost of time to teaching assistants—comparing consent forms to the gradebook, and generating a report to the researchers four times.

Finally, the nature of the study resources students use are constantly evolving, as technology and internet sources change rapidly, even since the inception of this study. Electronic resources for this study, fell under two, broad definitions: electronic resources associated with the course (electronic textbooks, etc.), and all other electronic resources (YouTube.com, Google.com, etc.). Perhaps it would benefit future researchers to itemize and identify specific sources that students use, via technology and the internet, by administering pilot questionnaires.

Recommendations and Implications

The results of this study may have implications for college student retention. If students have the motivation and self-discipline to achieve academic success, yet lack knowledge of specific academic skills, they may still struggle. Course instructors and academic advisors should be aware of the identified evidence behind the variables that relate to and predict academic success. Passing this information on to students may likely increase their chances of academic success and college retention. Institutions of higher education should consider utilizing and maintaining freshmen orientation programs to ease the transitions of new students to the expectations of college life. For some students, especially first-generation students, such programs may be the first time they

learn the roles of academic advisors, how to navigate their college, both geographically and online, and other campus resources which can help them succeed. Otherwise, they may continue to score significantly lower on several measures compared to non-first-generation students (see Table 10).

Students who identify in groups of higher risk of poor academic performance can make possible changes to improve it. For example, female students should be made aware of how their confidence in and perception of their academic abilities strongly correlates with their actual performance (Høigaard et al., 2015). Experiencing minor successes early in their academic experience, like getting high grades in their first semester, will likely boost their academic self-efficacy scores.

First-generation students should be aware of the importance of attending as many class sessions as possible. They should also seek out the direction of their academic advisors to become aware of college expectations as early as possible, which may increase their academic self-efficacy scores. Additionally, these students should be aware of academic resources like the Tutoring Center, the Writing Center, and the Financial Aid Office (to reduce employment hours) to help them succeed in their first few semesters. By establishing a higher academic self-efficacy score early, actual academic performance will likely begin higher, which in turn, may influence higher efficacy scores even more.

To help these at-risk college students, perhaps academic advisors and general education instructors should be trained in how women struggle with lower academic self-confidence, and how first-generation students generally

struggle more in college in almost every area. At the very least, first-generation students should be identified and contacted to let them know who their academic advisors are, and how to receive assistance from them.

Conclusion

There are many observed and extraneous variables that influence how students perform with their academics. While there have been numerous studies which focus on one or two variables predicting academic performance, there have not been any previously identified studies which assesses the influence of a combination of study behaviors, academic self-efficacy measures, and grouping demographics, to identify the most influential variables predictive of academic success.

As mentioned in Chapter I, there are many benefits of a college degree (better health, financial income, etc.), and for students who choose to pursue one, there are many obstacles that may make graduating more difficult. As mentioned, first-generation college students struggle more due to being unfamiliar with college expectations, the scholarship process, and other factors. By identifying which variables correlate with and predict academic performance for students enrolled in Introductory Psychology, instructors and academic advisors may help them make more informed decisions regarding their behaviors, both within and outside of the classroom, to succeed in college. Successful academic experiences will result in higher levels of academic self-efficacy, which will likely increase academic performance even more. In addition,

if such behaviors increase academic success in other courses, perhaps student retention rates will improve as well.

Currently, USU helps recent high school graduates and other freshmen students make an easier transition into college through their “SOAR” and “Connections” freshmen orientation programs. Additionally, courses like “Academic Skills and Strategies” (USU 1730) help students who are at risk for failing courses and dropping out of college. Because of these resources, students learn many best practices for the specific study behaviors and resources that are associated with better grades. The findings of this study may be used to further shape these programs and courses to help early college students succeed.

REFERENCES

Alon, S., & Gelbgiser, D. (2011). The female advantage in college academic achievements and horizontal sex segregation. *Social Science Research*, *40*(1), 107-119.

Anderson, E. G. (2009). Freshmen retention: The impact of a first year experience program on student satisfaction and academic performance. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *70*(2-A), 488-539.

Araque, F., Roldán, C., & Salguero, A. (2009). Factors influencing university dropout rates. *Computers & Education*, *53*(3), 563-574.

Ashraf, B. (2009). Teaching the google-eyed YouTube generation. *Education & Training*, *51*(5-6), 343-352.

Bandura, A. (1977). *Self-efficacy: Toward a unifying theory of behavioral change*. *Psychological Review, 84*(2), 191-215.

Bauldry, S. (2012). *An examination of potential variation in the benefits of higher education for health and wellbeing* (Doctoral dissertation). University of North Carolina at Chapel Hill, NC. Retrieved from http://gateway.proquest.com.dist.lib.usu.edu/openurl?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&res_dat=xri:pqm&rft_dat=xri:pqdiss:3512588

Blanc, R., & Martin, D. C. (1994). Supplemental instruction: Increasing student performance and persistence in difficult academic courses. *Journal of Medical Education*, *69*(6), 452-454.

Boden, K. (2011). Perceived academic preparedness of first-generation Latino college students. *Journal of Hispanic Higher Education*, *10*(2), 96-106.

Brocato, J. (1989). How much does coming to class matter? Some evidence of class attendance and grade performance. *Educational Research Quarterly*, *13*(3), 2-6.

Bronstein, S. B. (2008). Supplemental instruction: Supporting persistence in barrier courses. *Learning Assistance Review, 13*, 31-45.

Buckley, S. C. (2013). The effects of alternative study guide labels on testing in developmental reading. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *74*(5-A), E.

Burke, S. C., & Snyder, S. L. (2008). YouTube: An innovative learning resource for college health education courses. *International Electronic Journal of Health Education*, *11*, 39-46.

Caska, B. A., & Prentice, G. R. (2009). Assessments, appraisals, attributes, and attendance: Predicting statistics goals and grades. *The Irish Journal of Psychology*, *30*(1-4), 3-4.

Cech, E. A. (2014). Review of the rise of women: The growing gender gap in education and what it means for American schools. *American Journal of Sociology*, *119*(6), 1761-1763.

Chandler, P., & Sweller, J. (1991). Evidence for cognitive load theory. *Cognition and Instruction, 8,* 351-362.

Choi, N. (2005). Self-efficacy and self-concept as predictors of college students' academic performance. *Psychology in the Schools, 42,* 197-205.

Christian, J. (2012). Content-related interactions and methods of reasoning within self-initiated organic chemistry study groups. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *72*(7-B), 4031-4055.

Clifton, J. (2007). Preferential seating for college students with ADHD: Is it an effective accommodation? *Dissertation Abstracts International*, *68*(6-B), 4125.

College Board. (2017). *2017-18 tuition and fees at public four-year institutions by state and five-year percentage change in in-state tuition and fees.* Retrieved from http://trends.collegeboard.org/college-pricing/figures-tables/2017-18-state-tuition-and-fees-public-four-year-institutions-state-and-five-year-percentage#KeyPoints

Congos, D., & Mack, A. (2005). Supplemental instruction's impact in two freshman chemistry classes: Research, modes of operation, and anecdotes. *Research & Teaching in Developmental Education, 21*(2), 43-64.

Credé, M., Roch, S. G., & Kieszczynska, U. M. (2011). Class attendance in college: A meta-analytic review of the relationship of class attendance with grades and student characteristics. *Review of Educational Research*, *81*(4), 622-645.

Crooks, S. M., White, D. R., & Barnard, L. (2007). Factors influencing the effectiveness of note taking on computer-based graphic organizers. *Journal of Educational Computing Research*, *37*(4), 369-391.

Culp, M. M., & Dungy, G. J. (2014). *Increasing adult learner persistence and completion rates: A guide for student affairs leaders and practitioners*. Washington, DC: National Association of Student Personnel Administrators.

Dancer, D., Morrison, K., & Smith, M. (2007). Measuring the impact of a peer assisted learning program on students' academic performance in econometrics. In M. Davies, J. Hirschberg, C. Hohnston, & J. Lye (Eds.), *The quantitative analysis of teaching and learning in higher education: Forum proceedings* (pp. 19-42). Melbourne, Victoria, Australia: University of Melbourne.

Davis, M., & Hult, R. E. (1997). Effects of writing summaries as a generative learning activity during note taking. *Teaching of Psychology*, *24*(1), 47-49.

Dawson, P., van der Meer, J., Skalicky, J., & Cowley, K. (2014). On the effectiveness of supplemental instruction: A systematic review of supplemental instruction and peer-assisted study sessions literature between 2001 and 2010. *Review of Educational Research*, *84*(4), 609-639.

Day, J. C., & Newburger, E. C. (2002). *The big payoff: Educational attainment and synthetic estimates of work-life earnings*. Washington, DC. Economics and Statistics Administration..

Dunn, D. J. (2017), *College: Making it the right choice*. Retrieved from http://repository.uwyo.edu/honors_theses_17-18/10

Eisenman, R., Melville, C. L., & St. Andrie, C. F. (1992). Academic performance in reading a text as related to course grades: Student performance when studying is impossible. *Bulletin of the Psychonomic Society*, *30*(6), 511-512.

Eisner, S., & Rohde, K. (1959). Note taking during or after the lecture. *Journal of Educational Psychology, 50,* 301-304.

Entwistle, N., Tait, H., & Speth, C. (1996). Identifying and advising students with deficient study skills: An integrated computer-based package for staff and students. In M. Birenbaum & F. Dochy (Eds.), *Alternatives in assessment of achievements, learning processes and prior knowledge.* (p. 395). New York, NY: Kluwer Academic/Plenum Publishers.

Fagen, A. P., Crouch, C. H., & Mazur, E. (2002). Peer instruction: Results from a range of classrooms. *The Physics Teacher*, *40*, 206-209.

Fayowski, V., & MacMillan, P. D. (2008). An evaluation of the supplemental instruction programme in a first year calculus course. *International Journal of Mathematical Education in Science and Technology, 39*, 843-855.

Fazal, S., Hussain, S., Majoka, M. I., & Masood, S. (2012). The role of study skills in academic achievement of students: A closer focus on gender. *Pakistan Journal of Psychological Research*, *27*(1), 37-51.

Feldman, D. B., & Kubota, M. (2015). Hope, self-efficacy, optimism, and academic achievement: Distinguishing constructs and levels of specificity in predicting college grade-point average. *Learning and Individual Differences, 37*, 210-216.

Francois, B. (2013). First-generation college students' descriptions of the experience of community college. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *73*(12-A), E.

Fung, D., & Howe, C. (2012). Liberal studies in Hong Kong: A new perspective on critical thinking through group work. *Thinking Skills and Creativity*, *7*(2), 101-111.

Gadzella, B. M., Goldston, J. T., & Zimmerman, M. L. (1977). Effectiveness of exposure to study techniques on college students' perceptions. *The Journal of Educational Research*, *71*(1), 26-30.

Ganuza Hoaglund, Z. M. (2015). A continuum of persistence: Low-income and first-generation college students' perceptions of critical factors for postsecondary success. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *75*(7-A), E.

Gattis, K. W. (2002). Responding to self-selection bias in assessments of academic support programs: A motivational control study of supplemental instruction. *Learning Assistance Review, 7*(2), 26-36.

Gilbert, P. N., O'Brien, L. T., Garcia, D. M., & Marx, D. M. (2015). Not the sum of its parts: Decomposing implicit academic stereotypes to understand sense of fit in math and English. *Sex Roles*, *72*(1-2), 25-39.

Golding, J. M., Wasarhaley, N. E., & Fletcher, B. (2012). The use of flashcards in an introduction to psychology class. *Teaching of Psychology*, *39*(3), 199-202.

Head, A. J., & Eisenberg, M. B. (2010). How today's college students use Wikipedia for course-related research. *First Monday, 15*(3), Retrieved from http://journals.uic.edu/ojs/index.php/fm/article/view/2830/2476

Hensen, K. A., & Shelley, M. C. (2003). The impact of supplemental instruction: Results from a large, public, Midwestern university. *Journal of College Student Development, 44*, 250-259.

Hodges, R., Dochen, C., & Joy, D. (2001). Increasing students' success: When supplemental instruction becomes mandatory. *Journal of College Reading and Learning, 31*, 143-156.

Høigaard, R., Kovač, V. B., Øverby, N. C., & Haugen, T. (2015). Academic self-efficacy mediates the effects of school psychological climate on academic achievement. *School Psychology Quarterly, 30*(1), 64-74.

Hout, M. (2012). Social and economic returns to college education in the united states. *Annual Review of Sociology*, *38*, 379-400.

Hoyert, M. S., & O'Dell, C. D. (2009). Goal orientation and academic failure in traditional and nontraditional aged college students. *College Student Journal*, *43*, 1052-1061

Hu, J. (1999). An experimental research on the note-taking strategy of college students. *Psychological Science*, *22*(4), 377-378.

Hussar, W. J., & Bailey, T. M. (2017). *Projections of education statistics to 2025 (NCES 2017-019).* Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Ishitani, T. T. (2003). A longitudinal approach to assessing attrition behavior among first-generation students: Time-varying effects of pre-college characteristics. *Research in Higher Education, 44,* 433–449.

Jones, L. (1931). Class attendance and college marks. *School & Society*, *33*, 444-446.

Jones, C. H. (1984). Interaction of absences and grades in a college course. *The Journal of Psychology: Interdisciplinary and Applied*, *116*(1), 133-136.

Kiewra, K. A., & Benton, S. L. (1988). The relationship between information-processing ability and notetaking. *Contemporary Educational Psychology*, *13*(1), 33-44.

Kiewra, K. A., Mayer, R. E., Christensen, M., Kim, S., & Risch, N. (1991). Effects of repetition on recall and note-taking: Strategies for learning from lectures. *Journal of Educational Psychology*, *81*(1), 120-123.

Kooloos, J. G. M., Klaassen, T., Vereijken, M., Van Kuppeveld, S., Bolhuis, S., & Vorstenbosch, M. (2011). Collaborative group work: Effects of group size and assignment structure on learning gain, student satisfaction and perceived participation. *Medical Teacher*, *33*(13), 983-988.

Kobayashi, K. (2005). What limits the encoding effect of note-taking? A meta-analytic examination. *Contemporary Educational Psychology, 30,* 242-262.

Lasry, N., Mazur, E., & Watkins, J. (2008). Peer instruction: From Harvard to the two-year college. *American Journal of Physics*, *76*(11), 1066-1069.

Lawson, T. J., Bodle, J. H., & McDonough, T. A. (2007). Techniques for increasing student learning from educational videos: Notes versus guiding questions. *Teaching of Psychology*, *34*(2), 90-93.

Lenk, K., Rode, P., Fabian, L., Bernat, D., Klein, E., & Forster, J. (2012). Cigarette use among young adults: Comparisons between 2-year college students, 4-year college students, and those not in college. *Journal of American College Health*, *60*(4), 303-308.

Lloyd, M. E., & Eastman, E. M. (1977). Performance on study-guide and non–study- guide test questions as a function of study guide availability. *Journal of Personalized Instruction*, *2*(2), 80-83.

MacQuarrie, S., Howe, C., & Boyle, J. (2012). Exploring the characteristics of small groups within science and English secondary classrooms. *Cambridge Journal of Education*, *42*(4), 527-546.

Mahdi, A. E. (2006). Introducing peer-supported learning approach to tutoring in engineering and technology courses. *International Journal of Electrical Engineering Education, 43*, 277-287.

Martin, D.C., & Arendale, D. R. (1990). Supplemental instruction: Improving student performance, increasing student persistence. Kansas City MO: University of Missouri.

Mattison, H. (2013). Why underprepared students drop out of college. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *73*(12-A),

McLean, M., Van Wyk, J. M., Peters-Futre, E. M., & Higgins-Opitz, S. B. (2006). The small group in problem-based learning: more than a cognitive 'learning' experience for first-year medical students in a diverse population. *Medical Teacher*, *28*(4), 94-103.

Mehta, S. S., Newbold, J. J., & O'Rourke, M. A. (2011). Why do first-generation students fail? *College Student Journal*, *45*(1), 20-35.

Merrill, M. D., & Gilbert, C. G. (2008). Effective peer interaction in a problem-centered instructional strategy. *Distance Education*, *29*(2), 199-207.

Miller, H. E. (2015). Life gets in the way: A qualitative study of what nontraditional students view as life stressors. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *75*(11-A), E.

Miller, V., Oldfield, E., & Bulmer, M. (2004). Peer assisted study sessions (PASS) in first year chemistry and statistics courses: Insights and evaluations. In I. Johnston (Ed.), *2004 National UniServe Conference* (pp. 30-35). Sydney, New South Wales, Australia: UniServe Science.

Moore, R., & LeDee, O. (2006). Supplemental instruction and the performance of developmental education students in an introductory biology course. *Journal of College Reading and Learning, 36*(2), 9-20.

Moos, D. C. (2009). Note-taking while learning hypermedia: Cognitive and motivational considerations. *Computers in Human Behavior*, *25*(5), 1120-1128.

Narjaikaew, P., Emarat, N., & Cowie, B. (2009). The effect of guided note taking during lectures on Thai university students' understanding of electromagnetism. *Research in Science & Technological Education*, *27*(1), 75-94.

Ogden, P., Thompson, D., Russell, A., & Simons, C. (2003). Supplemental instruction: Short- and long-term impact. *Journal of Developmental Education, 26*(3), 2-8.

Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling. *Journal of Economic Perspectives*, *25*(1), 159-184.

Owen, S. V., & Froman, R. D. (1988, April). *Development of a college academic self-efficacy scale*. Paper presented at the 1annual meeting of the National Council on Measurement in Education, New Orleans, LA.

Papa, L. A. (2015). The impact of academic and teaching self-efficacy on student engagement and academic outcomes. Retrieved from http://digitalcommons.usu.edu/etd/4361

Parkinson, M. (2009). The effect of peer assisted learning support (PALS) on performance in mathematics and chemistry. *Innovations in Education and Teaching International*, *46*(4), 381-392.

Peguero, A. A., & Shaffer, K. A. (2015). Academic self-efficacy, dropping out, and the significance of inequality. *Sociological Spectrum, 35*(1), 46-64.

Peterfreund, A. R., Rath, K. A., Xenos, S. P., & Bayliss, F. (2008). The impact of supplemental instruction on students in STEM courses: Results from San Francisco State University. *Journal of College Student Retention: Research, Theory and Practice, 9*, 487-503.

Peverly, S. T., Brobst, K. E., Graham, M., & Shaw, R. (2003). College adults are not good at self-regulation: A study on the relationship of self-regulation, note taking, and test taking. *Journal of Educational Psychology*, *95*(2), 335-346.

Phelps, J. M., & Evans, R. (2006). Supplemental instruction in developmental mathematics. *Community College Enterprise, 12*(1), 21-37.

Phillips, L. S. (2013). Retention of nontraditional students in the face-to-face, online, and hybrid delivery methods in higher education. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *74*(6-A), E.

Raisman, N. (2013). *The cost of college attrition at four-year colleges and universities*. Retrieved from http://www.educationalpolicy.org/pdf/1302_PolicyPerspectives.pdf

Rani, A. J., Mythili, S. V., Devi, A. J. M., Shanthi, B., & Kalaiselvi, V. S. (2013). Teaching biochemistry using flash cards. *Medical Teacher*, *35*(7), 610.

Rath, K. A., Peterfreund, A. R., Xenos, S. P., Bayliss, F., & Carnal, N. (2007). Supplemental instruction in Introductory Biology I: Enhancing the performance and retention of underrepresented minority students. *CBE-Life Sciences Education, 6*, 203-216.

Reid, M. J., & Moore, J. L. I. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education*, *43*(2), 240-261.

Rockinson-Szapkiw, A. J., Courduff, J., Carter, K., & Bennett, D. (2013). Electronic versus traditional print textbooks: A comparison study on the influence of university students' learning. *Computers & Education*, *63*, 259-266.

Rogers, L., & Hallam, S. (2006). Gender differences in approaches to studying for the GCSE among high-achieving pupils. *Educational Studies*, *32*(1), 59-71.

Sanders, L., Sander, P., & Mercer, J. (2009). Rogue males? approaches to study and academic performance of male psychology students. *Psychology Teaching Review*, *15*(1), 3-17.

Schwalbe, M. (2013). Review of learning the hard way: Masculinity, place, and the gender gap in education. *American Journal of Sociology*, *119*(1), 295-297.

Sikorski, J. F., Rich, K., Saville, B. K., Buskist, W., Drogan, O., & Davis, S. F. (2002). Student use of introductory texts: Comparative survey findings from two universities. *Teaching of Psychology*, *29*(4), 312-313.

Slotte, V., Lonka, K., & Lindblom-Ylänne, S. (2001). Study-strategy use in learning from text: Does gender make any difference? *Instructional Science*, *29*(3), 255-272.

Snyder, S. (2014). A phenomenological study of how high school advanced placement classes prepared first-generation college students for postsecondary education. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *74*(9-A), E.

Sokolove, P. G., & Marbach-Ad, G. (1999). The benefits of out-of-class group study for improving student performance on exams: A comparison of outcomes in active-learning and traditional college biology classes. *Journal of Excellence in College Teaching*, *10*(3), 49-67.

Stansbury, S. (2001). Accelerated learning groups enhance supplemental instruction for at-risk students. *Journal of Educational Studies, 54*, 89-102.

Stephens, N. M., Fryberg, S. A., Markus, H. R., Johnson, C. S., & Covarrubias, R. (2012). Unseen disadvantage: How American universities' focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, *102*(6), 1178-1197.

Stinebrickner, R., & Stinebrickner, T. (2014). Academic performance and college dropout: Using longitudinal expectations data to estimate a learning model. *Journal of Labor Economics*, *32*(3), 601-644.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12,* 257-285.

Taylor, L. A. (2012). Cutting class harms grades. *Decision Sciences Journal of Innovative Education*, *10*(1), 49-61.

Terpend, R., Gattiker, T. F., & Lowe, S. E. (2014). Electronic textbooks: Antecedents of students' adoption and learning outcomes. *Decision Sciences Journal of Innovative Education*, *12*(2), 149-173.

Torres, L. H., Fernández, G. J., & Vázquez, A. C. (2011). Learning in university students in the first and last year of psychology and education degrees. *Electronic Journal of Research in Educational Psychology*, *9*(2), 659-692.

U.S. Census Bureau. (2014). *Historical income tables: Households.* Washington, DC: U.S. Department of Commerce. Retrieved from http://www.census.gov/hhes/www/income/data/historical/household/index.html

U.S. Department of Education. (2015). *Fast facts: Back to school statistics.* Retrieved from http://nces.ed.gov/ fastfacts/display.asp?id=372

U.S. Department of Education. (2017). *The condition of education 2017: Undergraduate retention and graduation rates.* Retrieved form https://nces.ed.gov/programs/coe/ indicator_ctr.asp

Utah System of Higher Education. (2015). *Compared with nation, Utah has high rate of nontraditional students*. Retrieved from http://higheredutah.org/compared-with-nation-utah-has-high-rate-of-nontraditional-students/

Van Blerkom, M. L. (1992). Class attendance in undergraduate courses. *The Journal of Psychology: Interdisciplinary and Applied*, *126*(5), 487-494.

Wandersee, J. H. (1988). Ways students read texts. *Journal of Research in Science Teaching*, *25*(1), 69-84.

Wang, C. W., & Neihart, M. (2015). Academic self-concept and academic self-efficacy: Self-beliefs enable academic achievement of twice-exceptional students. *Roeper Review: A Journal on Gifted Education, 37*(2), 63-73.

Willoughby, T., Wood, E., McDermott, C., & McLaren, J. (2000). Enhancing learning through strategy instruction and group interaction: Is active generation of elaborations critical? *Applied Cognitive Psychology*, *14*, 19-30.

Winstone, N., & Bretton, H. (2013). Strengthening the transition to university by confronting the expectation-reality gap in psychology undergraduates. *Psychology Teaching Review*, *19*(2), 2-14.

Wisely, L. W. (2014). Relationships between college knowledge and college-going beliefs of eighth grade students. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *75*(1-A), E.

Wright, G. L., Wright, R. R., & Lamb, C. E. (2002). Developmental mathematics education and supplemental instruction: Pondering the potential. *Journal of Developmental Education, 26*(1), 30-35.

Zazulia, A. R., & Goldhoff, P. (2014). Faculty and medical student attitudes about preclinical classroom attendance. *Teaching and Learning in Medicine*, *26*(4), 327-334.

Zeisman, G. S. (2013). First-generation student success after academic warning: An exploratory analysis of academic integration, personal adjustment, family and social adjustment and psychological factors. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *74*(1-A), E.

APPENDICES

Appendix A

College Student Study Behaviors and Resources Survey

Q1: To prepare for this final exam only, did you...

	Yes (1)	No (2)
attend class? (1)	❍	❍
use your textbook? (2)	❍	❍
take notes? (3)	❍	❍
review your notes? (4)	❍	❍
review PowerPoint lecture slides? (5)	❍	❍
attend student instruction (SI) sessions? (6)	❍	❍
study with your classmates as a group? (7)	❍	❍
use a study guide? (8)	❍	❍
use flashcards? (9)	❍	❍
use course electronic resources (textbook software, Learn Smart, Mind Tap, etc.)? (10)	❍	❍
use course-alternative electronic resources (YouTube, Wikipedia, Google, etc.)? (11)	❍	❍

Answer If To prepare for this final exam only, did you... attend class? – Yes Is Selected

Q2: What percentage of the total class sessions did you attend since your last exam?
_____ Your % (1)

Answer If To prepare for this final exam only, did you... attend class? – Yes Is Selected

Q3: How effective was attending class to help you prepare for this exam?
❍ Very Effective (1)
❍ Effective (2)
❍ Neither Effective nor Ineffective (3)
❍ Ineffective (4)
❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... use you textbook? – Yes Is Selected

Q4: Of the total textbook material covered for this exam, what percentage did you review?
_____ Your % (1)

Answer If To prepare for this final exam only, did you... use you textbook? – Yes Is Selected

Q5: For this exam, how many hours did you spend studying your textbook? (type in a number below)

Answer If To prepare for this final exam only, did you... use you textbook? – Yes Is Selected

Q6: How effective was reviewing the textbook to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... take notes? – Yes Is Selected

Q7: Since your last exam, what percentage of the total course content did you take notes on?
_____ Your % (1)

Answer If To prepare for this final exam only, did you... take notes? – Yes Is Selected

Q8: How effective was taking notes to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... review your notes? – Yes Is Selected

Q9: How many hours did you spend reviewing your notes to prepare for this exam? (type in a number below)

Answer If To prepare for this final exam only, did you... review your notes? – Yes Is Selected

Q10: How effective was reviewing your notes to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... review PowerPoint lecture slides? – Yes Is Selected

Q11: For this final exam, what percentage of the total PowerPoint Lecture Slides did you review?
_____ Your % (1)

Answer If To prepare for this final exam only, did you... review PowerPoint lecture slides? – Yes Is Selected

Q12: To study for this exam, how many hours did you spend reviewing the PowerPoint lecture slides? (type in a number below)

Answer If To prepare for this final exam only, did you... review PowerPoint lecture slides? – Yes Is Selected

Q13: How effective was reviewing PowerPoint lecture slides to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... attend student instruction (SI) sessions? – Yes Is Selected

Q14: Since your last exam, how many student instruction (SI) sessions did you attend?

- ❍ 1 SI session (1)
- ❍ 2 SI sessions (2)
- ❍ 3 SI sessions (3)
- ❍ 4 SI sessions (4)
- ❍ 5 SI sessions (5)
- ❍ 6 SI sessions (6)
- ❍ 7 SI sessions (7)
- ❍ 8 SI sessions (8)
- ❍ 9 SI sessions (9)
- ❍ 10+ SI sessions (10)

Answer If To prepare for this final exam only, did you... attend student instruction (SI) sessions? – Yes Is Selected

Q15: How effective was attending student instruction (SI) sessions to help you prepare for this exam?

- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... study with your classmates as a group? – Yes Is Selected

Q16: To study for this exam, how many times did you study with your classmates as a group? (type in a number below)

Answer If To prepare for this final exam only, did you... study with your classmates as a group? – Yes Is Selected

Q17: Since your last exam, how many total hours did you spend studying with your classmates in groups?
- ❍ 1 hour (1)
- ❍ 2 hours (2)
- ❍ 3 hours (3)
- ❍ 4 hours (4)
- ❍ 5 hours (5)
- ❍ 6 hours (6)
- ❍ 7 hours (7)
- ❍ 8 hours (8)
- ❍ 9 hours (9)
- ❍ 10+ hours (10)

Answer If To prepare for this final exam only, did you... study with your classmates as a group? – Yes Is Selected

Q18: How many people, including yourself, were in your study group? (on average, if you met more than once)
- ❍ 2 (1)
- ❍ 3 (2)
- ❍ 4 (3)
- ❍ 5 (4)
- ❍ 6 (5)
- ❍ 7 (6)
- ❍ 8 (7)
- ❍ 9 (8)
- ❍ 10+ (9)

Answer If To prepare for this final exam only, did you... study with your classmates as a group? – Yes Is Selected

Q19: How did you and your group members study together? (check all that apply)
- ❑ We quizzed each other on key terms (1)
- ❑ We took turns reading the text book (2)
- ❑ We reviewed each others' notes (3)
- ❑ We explained concepts to each other (4)
- ❑ We used online resources (5)
- ❑ We reviewed the lecture slides (6)
- ❑ We used flashcards (7)
- ❑ We went over study guides (9)
- ❑ We did a basic review of the text book (10)
- ❑ Other (Specify): (8) _____

Answer If To prepare for this final exam only, did you... study with your classmates as a group? – Yes Is Selected

Q20: How effective was studying with your classmates as a group to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... use a study guide? – Yes Is Selected

Q21: Since your last exam, how many total hours did you spend using study guides to study? (type in a number below)

Answer If To prepare for this final exam only, did you... use a study guide? – Yes Is Selected

Q22: How effective was using study guides to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Very Ineffective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... use flashcards? – Yes Is Selected

Q23: Since your last exam, how many total hours did you spend using flashcards to study? (type in a number below)

Answer If To prepare for this final exam only, did you... use flashcards? – Yes Is Selected

Q24: How effective was using flashcards to help you study for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... use course electronic resources (textbook software, Learn Smart, Mind Tap, etc.)? – Yes Is Selected

Q25: Since your last exam, how many hours did you spend using course electronic resources (textbook software, Learn Smart, etc.) to prepare for this exam? (type in a number below)

Answer If To prepare for this final exam only, did you... use course electronic resources (textbook software, Learn Smart, Mind Tap, etc.)? – Yes Is Selected

Q26: How effective was using course electronic resources (textbook software, Learn Smart, etc.) to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Answer If To prepare for this final exam only, did you... use course-alternative electronic resources (YouTube, Wikipedia, Google, etc.)? – Yes Is Selected

Q27: Since your last exam, how many hours did you spend using course-alternative electronic resources (YouTube, Wikipedia, Google, etc.) to prepare for this exam? (type in a number below)

Answer If To prepare for this final exam only, did you... use course-alternative electronic resources (YouTube, Wikipedia, Google, etc.)? – Yes Is Selected

Q28: How effective was using course-alternative electronic resources (YouTube, Google, etc.) to help you prepare for this exam?
- ❍ Very Effective (1)
- ❍ Effective (2)
- ❍ Neither Effective nor Ineffective (3)
- ❍ Ineffective (4)
- ❍ Very Ineffective (5)

Q29: Are there other ways you studied for this final exam that you found to be effective?

Q30: Please make any other general comments.

Q31: What is your grade (or expected grade) on this exam?
- ❍ A (12)
- ❍ A- (11)
- ❍ B+ (10)
- ❍ B (9)
- ❍ B- (8)
- ❍ C+ (7)
- ❍ C (6)
- ❍ C- (5)
- ❍ D+ (4)
- ❍ D (3)
- ❍ D- (2)
- ❍ F (1)

Q32: What is your overall GPA?
- ❍ 3.5 – 4.0 (1)
- ❍ 3.0 – 3.4 (2)
- ❍ 2.5 – 2.9 (3)
- ❍ 2.0 – 2.4 (4)
- ❍ 1.5 – 1.9 (5)
- ❍ 1.0 – 1.4 (6)
- ❍ Lower than 1.0 (7)

Q33 How much confidence do you have about each of the behaviors below (CASES Measure, Owen & Froman, 1988)?

Q34: Please fill in your information.

Q35: Your Gender
- ❍ Male (1)
- ❍ Female (2)
- ❍ Other (3)
- ❍ Prefer not to say (4)

Q36: Your Age

Q37: How many children do you have? If you have no children, type “0”.

Q38: Are you currently employed? If YES, indicate how many hours a week you work on average. If NO, mark the “Zero” option.

❍ Zero hours per week (1)
❍ 1-10 hours per week (2)
❍ 11-20 hours per week (3)
❍ 21-30 hours per week (4)
❍ 31-40 hours per week (5)
❍ 41+ hours per week (6)

Q39: Are you a first-generation college student? (Answer “yes” if your parents and grandparents did not graduate from college/university.)

❍ Yes (4)
❍ No (5)
❍ Unsure (6)

Q40: Your Year in College

❍ Freshman (1)
❍ Sophomore (2)
❍ Junior (3)
❍ Senior (4)
❍ Graduate (5)

Q41: How many semesters have you been in college? (for example, if you are currently in your 4th semester, then type the number, 4

Q42: You are taking this course because (mark all that apply):

❑ It is an interesting elective (1)
❑ It fills a general education requirement (2)
❑ It is relevant to my major / minor (3)

Q43: Please fill in your information, so we can give you lab credit. (You will only receive 4 total email notifications to simply prompt you when the next survey is available. Provide your preferred email address, so you can get more lab credit.)

Your First Name (1)
Your Last Name (2)
Your A Number (3)
Your preferred email address (so you can get more lab credit later this semester. You will not receive spam.) (4)
Your email address again (to make sure it matches the one above) (5)

Appendix B

Analysis of Statistical Power per Number of Predictors

Table B1

Power Analysis

Number of predictors for statistical power of .8 and $p < .05$	Required *n* for small effect size (.02)	Required *n* for medium effect size (.15)	Required *n* for large effect size (.35)
3 Predictors	543	76	36
4 Predictors	597	84	39
5 Predictors	643	91	43
6 Predictors	684	97	46
7 Predictors	721	103	49
8 Predictors	755	108	52
9 Predictors	788	113	54
10 Predictors	818	118	57
11 Predictors	847	122	59
12 Predictors	874	127	61
13 Predictors	901	131	63
14 Predictors	926	135	66
15 Predictors	950	139	68
16 Predictors	974	142	70
17 Predictors	997	146	72
18 Predictors	1,019	149	74
19 Predictors	1,041	153	76
20 Predictors	1,061	156	77

(http://www.danielsoper.com/statcalc3/calc.aspx?id=1)