An Exploration and Identification of Factors That Predict Performance in a Large General Education Course in Higher Education

Kristen C. Betts
Brigham Young University

Follow this and additional works at: https://scholarsarchive.byu.edu/etd

BYU ScholarsArchive Citation

This Dissertation is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of BYU ScholarsArchive. For more information, please contact ellen_amatangelo@byu.edu.
An Exploration and Identification of Factors That Predict Performance in a Large General Education Course in Higher Education

Kristen C. Betts

A dissertation submitted to the faculty of Brigham Young University in partial fulfillment of the requirements for the degree of Doctor of Education

Donald Baum, Chair Pamela Hallam A. LeGrand Richards Michael Owens

Department of Educational Leadership and Foundations Brigham Young University

Copyright © 2021 Kristen C. Betts All Rights Reserved
ABSTRACT

An Exploration and Identification of Factors That Predict Performance in a Large General Education Course in Higher Education

Kristen C. Betts
Department of Educational Leadership and Foundations, BYU
Doctor of Education

This study explores a variety of variables with the intent of identifying specific student groups that may struggle with performance in a large general education course. The ultimate objective of this study is to facilitate the success of acknowledged at-risk students. Drawing in part on the theory of social capital, this study examines established, pre-college predictors such as high school grade point averages and ACT scores, other demographic characteristics and stressors, and an optional, study group course to parse out information related to course performance. Methods used included t-tests and multiple regression analysis using five statistical models. A portion of the Student-Life Stress Inventory (Gadzella, 1994) was sent to students to gather primary data. A total of 1,626 students completed the survey: 957 female and 669 male. Demographic information was obtained from the university. After controlling for factors such as race, sex, estimated household income, parent educational level, and self-reported stress, findings identified differences in course performance based on specific student characteristics. The findings of this study highlight the importance of pre-college predictors and course related features in individual student performance, while acknowledging the implications of race, first-generation status, and other demographic factors. These findings may help inform universities as they identify and implement supports for academically at-risk student populations in large university courses.

Keywords: college students, first generation college students, undergraduate study
ACKNOWLEDGMENTS

Robert Frost once penned, “Two roads diverged in a wood, and I – I took the one less traveled by, and that has made all the difference.” This dissertation has been my personal road and although it is the road less traveled, I have had individuals along the way that have helped me on my journey. To the following I am grateful:

- My husband, Stacy Betts, who has always supported me in my pursuits and kept me grounded.
- My three daughters (Marissa, Stephanie, and Kara) and mom (Dr. LaRae D. Carter), who encouraged me to apply for the program and cheered me on throughout. And my dad (Ronald G. Carter) who, although not here, has always been my biggest supporter.
- My chair, Professor Donny Baum, his support, guidance, and expertise have made this experience, while difficult, exciting and inspiring. He excelled at pushing me while providing the necessary supports for a positive experience.
- The American Heritage faculty and staff. Thank you for the support, help, and interest you had in this research study.
- My committee members, Buddy, Pam, and Mike. Each exemplified a powerful educator at their best. Their feedback during this process was invaluable.
- The McKay School of Education and McKay School Dean’s Office for funding research through the Experiential Learning Grant.
- My research team, Emily Magleby, Taylor Holliday, and Karee Brown. Each of you is a credit to young scholars.
- My cohort – Anthony, Jaynie, Jodi, Kami, Liz, Memo, Mike, and Suzanne. I could not have done this without you.
TABLE OF CONTENTS

TITLE PAGE ................................................................................................................................... i
ABSTRACT....................................................................................................................................... ii
ACKNOWLEDGMENTS ................................................................................................................. iii
TABLE OF CONTENTS .................................................................................................................. iv
LIST OF TABLES ........................................................................................................................... vii
LIST OF FIGURES ....................................................................................................................... viii
DESCRIPTION OF DISSERTATION STRUCTURE AND CONTENT ........................................... ix

Introduction ..................................................................................................................................... 1
    Pecuniary Benefits .................................................................................................................... 1
    Non-Pecuniary Benefits of Education ....................................................................................... 2
    The Importance of the First Year .............................................................................................. 2
    Why Retention is Important .................................................................................................... 3
Student Demographic Characteristics ......................................................................................... 3
    Race ......................................................................................................................................... 4
    Socio-Economic Status ............................................................................................................ 5
    First-Generation Students ....................................................................................................... 5
Pre-College Predictors of College Achievement .......................................................................... 7
    High School Grade Point Average .......................................................................................... 7
    Standardized Tests (ACT & SAT) ........................................................................................... 8
    Advanced Placement Exams .................................................................................................. 9
    Student Stress ........................................................................................................................ 10
Study Site and Context ............................................................................................................... 10
LIST OF TABLES

Table 1 Descriptive Statistics: Dichotomous Demographic Variables ........................................15

Table 2 Descriptive Statistics on Pre-College Predictors ................................................................18

Table 3 Internal Consistency of the Student-Life Stress Inventory (Cronbach’s α) ..........................20

Table 4 Balance Tests: Chi-Square Analysis of Enrollment in Study Group Course ......................23

Table 5 Balance Tests: Independent T-Tests of Enrollment in Study Group Course .......................24

Table 6 Regression Results: Student Demographics, First Generation Status, and Pre-College Predictors .........................................................................................................................25

Table 7 Regression Results on Stressors and Course Related Variables .......................................27

Table B1 Components of Final Grades by Semester ..................................................................84
LIST OF FIGURES

Figure 1 Estimated Household Income, in US Dollars, for US and Canadian Students ..........17
Figure A1 Economic Benefits of a College Education ...............................................................56
Figure A2 Enrollment by Race and Ethnicity .............................................................................58
Figure B1 Density for Final Percentage, Winter 2019 .................................................................84
Figure B2 Frequency of Letter Grades, Winter 2019 .................................................................85
Figure B3 Density for Final Percentage, Fall 2019 .................................................................85
Figure B4 Frequency of Letter Grades, Fall 2019 .................................................................86
DESCRIPTION OF DISSERTATION STRUCTURE AND CONTENT

This dissertation, *An Exploration and Identification of Factors That Predict Performance in a Large General Education Course in Higher Education*, is written in a hybrid format approved by Brigham Young University’s David O. McKay School of Education. The hybrid format permitted me to define a problem in my practice, systematically research scholarly texts, and design and implement a rigorous analysis. The intent of this process is to communicate findings from my scholarship to a broader practitioner audience through a journal publication format. This dissertation is not in a traditional five-chapter format but rather concentrates on a journal-ready manuscript, which is the focus of this dissertation. In addition to the journal manuscript are the appendices which include an extended review of the literature and associated references (Appendix A), extended methods and associated references (Appendix B), information regarding the Institutional Review Board (IRB; Appendix C), approval of the study (Appendix C), and survey instrument (Appendix D). Due to word limitations, the methods and literature will be shortened in the body of the paper, but the appendices will include more detailed information.

The target journal for this dissertation is the *College Student Journal*. This journal was founded in 1966 and has been published continuously since that time. The journal is currently published by Project Innovation, a publisher focusing on peer reviewed academic journals, and edited by Dr. Phil Feldman on a quarterly basis. The purpose of the *College Student Journal* is to publish papers that investigate and address student learning, values, attitudes and opinions. The exploratory nature of this dissertation with its focus on a general education course and student learning represented by course performance seems apt for the *College Student Journal*. 
**Introduction**

College attendance, performance, and completion are critical to students’ future economic earnings and elevated lifestyle. Extensive literature focuses on and thoroughly describes the pecuniary benefits of obtaining a college degree including improved salaries, employment, and retirement opportunities of individuals with higher education (Brand & Xie, 2010; Carnevale, Jayasundara, & Cheah, 2013; Carnevale, Smith, & Stroll, 2013; Corts & Stoner, 2011; Hout, 2012; Oreopoulos & Petronijevic, 2013). Research highlights non-pecuniary benefits of college as well, such as better health, the expectation that most people can be trusted, and less risky behavior (Cutler & Lleras-Muney, 2010; Groot & van den Brink, 2007; Grossman, 2006; Lawrence, 2017; Oreopoulos & Salvanes, 2011). Having a successful first year in college is seen as an important factor of retention (Saunders-Scott et al., 2018), course selection, and choice of major (Main & Ost, 2014).

**Pecuniary Benefits**

Literature is filled with the role education plays in the economic success of students. A college degree can insulate an employee during times of recession, is correlated with higher lifetime earnings, and expands opportunities for a variety of potential careers (Brand & Xie, 2010; Carnevale, Jayasundara, & Cheah, 2013; Carnevale, Smith, & Strohl, 2013; Hout, 2012; Ma et al., 2016). The completion of college could be considered the gateway into the middle class (DeAngelo & Franke, 2016). Interestingly, it is not just the college graduate that benefits. UCLA economist E. Moretti (2004) analyzed data from the same labor markets and found evidence of a spillover effect linked with higher levels of education. Those with higher levels of education received higher compensation; however, for every percentage point increase in college graduates in the same workforce, wages for high school dropouts increased by 1.9%, wages for
high school graduates increased by 1.6%, and wages for college graduates increased by .04%.

Stated simply, a college degree not only improves the economic capacity of the individual, but it can also improve the economic gain for those proximal, regardless of educational level.

**Non-Pecuniary Benefits of Education**

Outside of the possible economic success, a college education can have additional benefits. Oreopoulos and Petronijevic (2013) advised that while difficult to measure, potential non-pecuniary benefits are associated with college completion. College graduates engage in less risky behaviors, have better health (living a healthier lifestyle), report being happier, and live longer (Cutler & Lleras-Muney, 2010; Groot & van den Brink, 2007; Grossman, 2006; Hout, 2012; Lawrence, 2017; Ma et al., 2016; Oreopoulos & Salvanes, 2011).

**The Importance of the First Year**

To maximize the pecuniary and non-pecuniary benefits associated with a college degree, students need to complete their degree. Whether or not a student completes a degree rests heavily on their academic performance in the first year. In a study using data from over 32,000 students enrolled at the University of Washington system, Aulck et al. (2016) concluded that student retention can be predicted even when based on only one term of academic data. Additional emphasis of the importance of a student’s first year in college is supported by literature focused on college performance (Baker & Robnett, 2012; College Atlas, 2014; Garett et al., 2017; Rodríguez-Muñiz et al., 2019; Stinebrickner & Stinebrickner, 2014). As such, special attention is given to the importance of first-year students and general education courses which provide the structure for future success.
Why Retention is Important

College completion is necessary for the full realization of the economic advantages associated with higher education. A completed bachelor’s degree is economically rewarding; dropping out of college before completion does not hold the same economic rewards (Oreopoulos & Petronijevic, 2013). Ma et al. (2016) emphasized the importance of college completion:

As a society, our goals should include both increasing the share of people who have the opportunity to participate in postsecondary education and reducing the number of people for whom it does not work out well. The solution is to reduce barriers to both access and success in postsecondary studies. (p. 8)

This study builds upon existing research on the success of post-secondary students, including predictors of academic achievement and performance constraints.

Student Demographic Characteristics

College performance and completion has been shown to be associated with a range of different student characteristics (Pascarella et al., 2004; Reason, 2003; Richardson et al., 2012; Seifert et al., 2010). Common characteristics previously and currently analyzed in research include demographic factors (race, sex, and whether a student is a first-generation college student (FGS) among others) and college performance. A number of researchers have indicated the significance of pre-college predictors in student performance and their importance in facilitating success in higher education (Allensworth & Clark, 2020; Asamsama et al., 2016; Harackiewicz et al., 2002; Saunders-Scott et al., 2018). Rigorous high school courses have often been seen as predictive in college performance (Maruyama, 2012).
**Race**

In the 2019 status report, *Race and Ethnicity in Higher Education*, the number of students of color among undergraduates increased from 30% in 1995-96 to 45% in 2015-16 (Espinosa et al., 2019). Despite these improvements, significant obstacles (Espinosa et al., 2019), such as access to quality secondary education and the influence of family background (Maruyama, 2012; Mijs, 2016) are clearly discernible. An increase in enrolled students of color is not evident in this particular study (see Table 1), where students of color accounted for 16.6% of enrolled students.

Furthermore, there is a clearly established racial college completion gap. Black students are less likely to graduate than their white peers (Flores et al., 2017; Ishitani, 2006). In the February 2019 report by the National Center for Education Statistics, and using data from the Fall 2010 entering class, Asian students had the highest graduation rate at 74%, White students were at 64%, Mixed-Race students at 60%, Hispanic students at 54%, Pacific Islander students at 51% and Black and American Indian students at 40% and 39%, respectively (National Center for Education Statistics, 2019). Research has explored the reasons why racial completion gaps exist. Minority students are more likely to come from secondary education institutions unprepared for the rigors of college courses and are also more likely to leave college before completing a degree (Adelman, 2006; Flores et al., 2017). Students of color may also have responsibilities outside of campus, for example, work, financial, and/or familial duties that may hinder their academic success (Baker & Robnett, 2012).

For some students of color, completion gaps may also involve discrimination and/or the experience of micro-aggressions which can be detrimental to their academic experience (Baker & Robnett, 2012; Fischer, 2007; Stevens et al., 2018). Results from a case study conducted by Baker and Robnett (2012) found that the experiences students of color undergo once in college
were important, even more so than pre-college experiences. Other research has indicated that pre-college experiences, such as socioeconomic status (SES), parental college attainment, and secondary school resources – both material and human – can also influence minority students’ academic preparation (Holland, 2010; Perna & Titus, 2005).

**Socio-Economic Status**

Unbeknownst to low SES students, “rules” of higher education may lead to barriers in their academic experience (Stephens, Fryberg, et al., 2012; Stephens, Townsend et al., 2012). Socioeconomic status not only influences student experiences in a college environment, but it can also influence college graduation rates (Jury et al., 2017). Students whose families earned $25,000 or less were at a 49% higher risk of leaving college after the first year than students with a higher family income (family earnings of $45,000 or more; Ishitani, 2003). Low-SES students may be required to work more and have less time for study and extracurricular activities (Bozick, 2007; Walpole, 2003), resulting in fewer connections to the college culture. In addition, current systems of higher education advantage students from higher SES backgrounds which provides those students with a benefit unrelated to prior academic preparation (DeAngelo & Frank, 2016; Liu, 2011). These trends are consistent across research; although, some research indicates only a weak-to-moderate link between SES and academic performance (Richardson et al., 2012; Rodríguez-Hernandez et al., 2020; Sackett et al., 2012, Westrick et al., 2015).

**First-Generation Students**

Studies have been conducted on the academic success of first-generation college students. FGS are often at a disadvantage and may face more failure in the important first year of college given inadequate high school preparation (Nunn, 2021). FGS experience higher rates of attrition, lower rates of timely graduation, and lower scores or GPAs for students in this situation (Chen &
Carroll, 2005; Ishitani, 2003, 2006). Recent research postulated that the culture evident in higher education, based on middle- and upper-class norms of independence, also places FGS at a disadvantage given the working-class environment that many FGS are familiar with, and that environment’s focus on interdependence and associated norms (Stephens, Fryberg, et al., 2012; Stephens, Townsend, et al., 2012). FGS may also have less of a sense of academic belonging as they transition to academics at a college level (Nunn, 2021). Academic belonging, initially comes from a sense of academic competence in coursework and it difficult to achieve, especially in the first year (Nunn, 2021).

FGS and their parents may also be at a disadvantage in navigating the support available in a college setting due to inexperience with such entities (Hansen & Mastekaasa, 2006; Martin et al., 2014; Nunn, 2021). FGS are also less likely to access resources on campus: faculty, teaching assistants, and other students (Adams et al., 2016; Nunn, 2021). In part, this could be attributed to the lack of exposure that they and their families have with the college environment (Cataldi et al., 2018; Holland, 2010; Nunn, 2021).

Social capital theory offers some insight as to why FGS are less likely to experience academic success in higher education (Moschetti & Hudley, 2015). Social capital theory addresses how the social and personal relationships an individual has can be of value in accessing and acquiring various resources both in an educational setting (Perna & Titus, 2005) and in society at large (Horvat, 2001). Perhaps the most important aspect of social capital is that a student who fosters social capital will be able to access vast institutional resources and campus supports, while at the same time gaining access to other, nontraditional forms of capital as well (Perna & Titus, 2005).
This study draws upon Portes’ (1998) approach to social capital. Portes stated that “social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures” (p. 6). Applied to the experience of students in higher education, social capital can be redefined as the benefits of social ties as they relate to information, resources, and advantages accessed by FGS.

Social capital matters for a college student. Processes and resources that many students with college educated parents implicitly understand such as registration dates and deadlines, scholarship opportunities, access to optional academic review rooms, and meeting with faculty during office hours may be lost on a student without relationships inherent to social capital (Acar, 2011; Dumais & Ward, 2010; Moschetti & Hudley, 2015; Nunn, 2021).

**Pre-College Predictors of College Achievement**

In addition to the demographic student characteristics discussed above, prior research has investigated the predictive validity of pre-college student achievement measures in determining academic success during college. Three of the most-commonly studied determinants include a student’s high school grade point average (HSGPA), performance on college entrance exams (such as the SAT and ACT), and Advanced Placement (AP) classes.

**High School Grade Point Average**

In the existing literature, some debate (and mixed evidence) exists on the validity of using either a student’s HSGPA or their entrance exam scores as a predictive variable for college performance. Despite this, there is some evidence that shows HSGPA may be a more effective predictor of college grades across demographics. One current study found that high school grades are five times better at predicting collegiate success than test scores (Allensworth & Clark, 2020). Zwick (2019) and Bowen et al. (2009) found that HSGPAs could better predict
college graduation than standardized test scores. Furthermore, HSGPA is less closely correlated with a student’s socioeconomic status than are standardized test scores (Bowen et al., 2009; Geiser & Santelices, 2007). This is important because, traditionally, colleges have placed emphasis in admission decisions on standardized test scores, thereby disadvantaging students from lower SES backgrounds.

Some critics of the use of HSGPA for predicting college performance charge that there is a lack of common grading criteria across schools, and some hold apprehensions about grade inflation (Camara & Michaelides, 2005). Such critics often look at standardized exams, like the ACT, as a more reliable and consistent resource when predicting college grades or performance (Westrick et al., 2015).

**Standardized Tests (ACT & SAT)**

Enrollment at most universities is based, in part, on ACT or SAT scores. Bettinger et al. (2013) found that, even when controlling for race and gender, ACT sub scores of math and English were highly predictive of first-year college GPA. Bettinger et al. later indicated that a strong correlation between higher ACT composite test scores and positive college outcomes did exist but disguised an important pattern (2013). While math and English scores were highly correlated with college success, the ACT subtests of reading and science were not predictive of college performance (Bettinger et al., 2013). Despite the indicated limited capacity for predicting college performance of some sections of the standardized exams, test scores supply pertinent information especially for students who may have been home-schooled, students who are international, and students whose academic record may be weak, but they are capable of excellent college academic work (Zwick, 2017). Overall, the research tends to show college
entrance exams to be less predictive of college achievement than HSGPA (Allensworth & Clark, 2020).

Critics of standardized testing being used for admission purposes have purported that the use of such exams can unnecessarily keep qualified students from attending post-secondary institutions. Underserved populations including students of color, FGS, and students from lower SES have been considered to be applicants who perceive that their standardized test scores are not a good match for their ability (Cortes, 2013; Syverson et al., 2018).

**Advanced Placement Exams**

In addition to ACT scores and HSGPA, enrollment and pass rates for Advanced Placement (AP) courses with content integral to the course were also examined. In a study conducted by Scott et al. (2010) the results indicated that students who received AP credit in high school had better college performance than their peers who did not receive AP credit, regardless of race or gender. They surmised that AP experience in high school would lead to better performance in higher education (Scott et al., 2010), though they did not account for selection bias in AP class enrollment. Further limitations of this study may be school quality or available resources as confounding variables (Fischer, 2007; Liu, 2011; Mijs, 2016).

Klopfenstein and Thomas found conflicting results in their 2009 research. They agreed that taking AP courses could be predictive of college success but found no evidence that taking AP courses while in high school was causally linked to early college success (Klopfenstein & Thomas, 2009). They further argued that rather than having predictive value, the research they conducted indicated that AP classes may have a “signaling” effect. Individual students that have AP experiences may possess difficult to measure abilities and motivations not found in their non-
AP peers (Klopfenstein & Thomas, 2009). Of particular interest to this study, they found that AP experience was significant for the first semester college GPA (Klopfenstein & Thomas, 2009).

**Student Stress**

Many argue that other cognitive and non-cognitive variables need to be examined in relation to college performance in the first year (Pascarella et al., 2004; Saunders-Scott et al., 2018; Sparkman et al., 2012). One non-cognitive factor that appears to influence student academic performance is levels of student stress. Stress often influences college students indirectly through heightened emotions and poor sleep quality (Garett et al., 2017). At a certain level, some stress can be a positive influence for students (Pierceall & Keim, 2007) in helping to increase productivity and growth (Musabiq & Karimah, 2020). Extreme stress, however, has been recognized as detrimental to academic performance (Zajacova et al., 2005) and can be a strong correlate of low college grades (Amirkhan & Kofman, 2018).

**Study Site and Context**

Brigham Young University (BYU) is a private, not-for-profit research institution (Carnegie Classification of Institutions, 2017) located in Provo, Utah. It is a religiously sponsored university under the oversight of a Board of Trustees; over 98% of the student body identify as members of The Church of Jesus Christ of Latter-day Saints (Brigham Young University, 2015). It is worth noting that membership and participation in The Church of Jesus Christ of Latter-day Saints may also be an aspect of social support and capital both prior to entry and upon enrollment. Every state in the United States and 105 countries are represented in BYU’s student body. The student body is composed of 50% male and 50% female students. It is a predominantly white university with 81% of the student body identifying as Caucasian (Brigham Young University, 2021).
BYU does not provide family income information for individual students; however, a New York Times article using millions of anonymous tax filings and tuition records did provide some estimates on the median family income of students from the class of 2013. The findings indicate that the median family income of a BYU student is $125,400 (New York Times, 2017). Federal statute prohibits individual information on student aid; however, the percentage of full-time first-time undergraduates that received federal student loans was 12% (Brigham Young University, 2020). Rates from the 2018-2019 academic year provide helpful background. The retention rate for full-time students was 88% and 83% of students graduated within six years with a bachelor’s degree (Brigham Young University, 2020).

General education, as an undergraduate requirement, has been identified as a key component in higher education (van der Wende, 2014). The opportunity for students to be introduced to a broad interdisciplinary curriculum that encourages communication, critical thinking, and problem solving is a trend seen in the United States and abroad (van der Wende, 2014).

American Heritage is the largest general education course taught at BYU and has over 3,700 enrolled students per academic year. The majority of students are freshmen directly from a high school experience or recently returned from serving a two-year volunteer mission. Both men and women can serve missions starting at the ages of 18 and 19 respectively. Many serve internationally and 65% of the student body can speak a second language. The missionaries are given leadership opportunities, opportunities to teach, and to focus on serving the communities in which they reside (Brigham Young University, 2021).

Most American Heritage students do not have prior experience at a post-secondary level. The students at this university are admitted with an average score of over 28 on the ACT.
entrance exam and with an average high school grade point average of 3.8+ (Brigham Young University, 2021). Based on entrance scores, this freshman class on average would be considered prepared for the demands of a post-secondary education and many are.

American Heritage is a unique college course. The teaching faculty of nine come from three different departments on campus (Economics, History, and Political Science) and collaborate to create this interdisciplinary course. On average, 70% of the students earn a C+ grade or higher in the course; however, a number of students do not perform well. As exemplified by data in American Heritage, not all students that attend college are prepared for the academic demands required for collegiate success (Asamsama et al., 2016), even with pre-college ability, as is the case with students in this study. Anecdotally, American Heritage is viewed as one of the most rigorous general education courses required for graduation. Analyzing percentage scores rather than the curved final grade is perhaps an evidence of the difficulty of this class. For example, one study participant received a C+ letter grade with a final percentage of 69%. For simplicity moving forward, American Heritage and “the course” will be used interchangeably.

**Statement of Purpose**

This study examines a range of student demographic characteristics, specifically, first-generation status, pre-college performance indicators, course characteristics, and student stressors, to first, better understand student performance in the course and secondly to potentially predict specific student groups that are underperforming and, ultimately, facilitate the success of such at-risk students. While the data collected is specific to one large general education course, it is anticipated that the empirical information gathered through this study will help inform future practice in a variety of higher education teaching situations. In addition, valuable information
may inform college administrators and faculty in working with specific student groups and facilitating optimal performance. In line with the sentiments of Pike and Kuh (2005), a higher education institution is unable to change the demographic characteristics of its students (and indeed, many higher institutions today are actively expanding access for traditionally-underserved populations), “But it can implement interventions that increase the odds that first-generation (or other specific group) college students “get ready,” “get in,” and “get through” by changing the way those students view college and by altering what they do after they arrive” (p. 292; emphasis added).

Informed by the literature discussed above, this study addresses the following research questions:

1. Is student performance in the American Heritage course predicted by student-level demographic variables?
2. Is FGS status significant in predicting student performance?
3. Are HSGPA, ACT score, or the number of AP classes taken in high school predictive of student performance?
4. What is the association between stress and student performance?
5. Does registration in an optional, peer-led study group course have a significant effect on course performance?

**Method**

**Sample and Data**

This study was conducted over two semesters (Winter and Fall) in 2019 at BYU. Enrollment numbers were consistent with previous semesters, with 1,515 students enrolled in
Winter 2019, and 2,281 students enrolled in Fall 2019. Student progress in the course was measured and evaluated at the end of each semester with a final score and letter grade.

Approval by the university institutional review board for access to student demographic data was requested and received. This data gathered included the semester enrolled (Winter vs. Fall), student sex, race, parent’s educational level, religion, missionary status, student athlete, international, transfer status, pre-college predictors, and registration in the optional study group course. Course-related material including section size, lecture size, and TA assignment was obtained from course administrative records. We analyzed both Winter and Fall 2019 semesters as a robustness check. If a variable was significant in both the Winter and Fall semesters, we considered that a better predictor of student performance.

**Dependent Variable**

The dependent variable in this study is student performance in the course as measured by final score at the end of each semester. The final score comprises a combination of scores on short essays, quizzes, and exams, and was adapted to a final grade to be posted on students’ transcripts. Across the two semesters, final percentage scores ranged from 0% to 99.6%, with a mean final percentage score of 80.3%.

**Independent Variables (Explanatory Variables)**

Table 1 below presents descriptive statistics of explanatory variables. The study incorporated four categories of explanatory variables: demographic characteristics, pre-college predictors, student stress survey responses, and course-level characteristics. Further exploration of variable measurements and application can be found in the model descriptions below.
### Table 1

**Descriptive Statistics: Dichotomous Demographic Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter 2019</td>
<td>921</td>
<td>28.85</td>
</tr>
<tr>
<td>Fall 2019</td>
<td>2,271</td>
<td>71.15</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1,388</td>
<td>43.48</td>
</tr>
<tr>
<td>Female</td>
<td>1,804</td>
<td>56.52</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian/Asian American</td>
<td>73</td>
<td>2.3</td>
</tr>
<tr>
<td>Black/African American</td>
<td>13</td>
<td>0.4</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>8</td>
<td>0.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>79</td>
<td>2.5</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>6</td>
<td>0.2</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>10</td>
<td>0.3</td>
</tr>
<tr>
<td>White</td>
<td>2,637</td>
<td>82.6</td>
</tr>
<tr>
<td>Multiple Ethnicities</td>
<td>341</td>
<td>10.7</td>
</tr>
<tr>
<td>Not reported</td>
<td>25</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Parents' Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First generation</td>
<td>324</td>
<td>10.2</td>
</tr>
<tr>
<td>One or more parent with college degree</td>
<td>2,868</td>
<td>89.8</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latter-day Saint</td>
<td>3,170</td>
<td>99.31</td>
</tr>
<tr>
<td>Non-Latter-day Saint</td>
<td>22</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>Mission</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>895</td>
<td>28</td>
</tr>
<tr>
<td>No</td>
<td>2,297</td>
<td>72</td>
</tr>
<tr>
<td><strong>Canadian Student</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
<td>0.8</td>
</tr>
<tr>
<td>No</td>
<td>3,166</td>
<td>99.2</td>
</tr>
<tr>
<td><strong>Athlete Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>62</td>
<td>1.96</td>
</tr>
<tr>
<td>No</td>
<td>3,104</td>
<td>98.04</td>
</tr>
<tr>
<td><strong>Transfer Student</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>788</td>
<td>24.7</td>
</tr>
<tr>
<td>No</td>
<td>2,404</td>
<td>75.3</td>
</tr>
<tr>
<td>Variable</td>
<td>Count</td>
<td>Percent</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Average Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $33,870</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>Between $33,870 - $68,273</td>
<td>752</td>
<td>23.6</td>
</tr>
<tr>
<td>Between $68,273 - $89,328</td>
<td>782</td>
<td>24.5</td>
</tr>
<tr>
<td>Between $89,328 - $111,038</td>
<td>784</td>
<td>24.6</td>
</tr>
<tr>
<td>Between $111,038 - $184,485</td>
<td>751</td>
<td>23.5</td>
</tr>
<tr>
<td>Between $184,485 - $250,001</td>
<td>27</td>
<td>0.8</td>
</tr>
<tr>
<td><strong># AP Courses Taken</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1,921</td>
<td>60.18</td>
</tr>
<tr>
<td>1</td>
<td>816</td>
<td>25.56</td>
</tr>
<tr>
<td>2</td>
<td>362</td>
<td>11.34</td>
</tr>
<tr>
<td>3</td>
<td>87</td>
<td>2.73</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>0.19</td>
</tr>
<tr>
<td><strong>Optional Study Course</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>616</td>
<td>19.2</td>
</tr>
<tr>
<td>No</td>
<td>2576</td>
<td>80.7</td>
</tr>
</tbody>
</table>

*Note.* Percentiles for average household income: 1st percentile $33,870; 25th percentile $68,273; 50th percentile $89,328; 75th percentile $111,038; 99th percentile $184,485; Maximum income - $250,001.

**Model 1**

The aim of Model 1 is to test the relationships between student demographic characteristics and academic performance. Independent variables used for Model 1 included sex (male/female), race (Hispanic\(^1\), Black, Mixed-race, Native or Alaskan American, Asian American, Hawaiian/Part-Hawaiian, Pacific Islander), religious affiliation (dichotomous variable indicating membership in The Church of Jesus Christ of Latter-day Saints (LDS)), mission status (a dichotomous variable measuring whether or not the student served a religious mission for the LDS church), Canadian citizenship (yes/no), student athlete status (yes/no), and estimated household income. Seventy international students (all international students with the exception of Canadian citizens) were not included in this study due to lack of accessible data.

\(^1\) Caucasian serves as the reference group for race in the regression models.
Household income for U.S. students was estimated based on the student’s permanent (home) address using geocoding and census tracts. BYU does not gather information on individual student’s household incomes. Given the importance of SES in research literature this study concentrated on providing the next best alternative. Census tracts allow us to use small and stable subdivisions of the country to estimate household income. The tracts can vary in population size between 1,200 and 8,000 with a preferred sized of 4,000 people. In short, the estimated household income used in this study is an average of averages (U.S. Census Bureau, 2019). Estimated household income for Canadian students was collected from division census tracts based on permanent address.² Across the sample, the mean household income is $92,067 and the median is $89,328. Figure 1 provides the distribution of household incomes within the study sample. Table 1 provides the counts and percentages for all categorical demographic characteristics.

**Figure 1**

*Estimated Household Income, in US Dollars, for US and Canadian Students*

² Given the difficulty of comparing household income across countries, this study is cautious in its utilization of the income variable for Canadian students.
Model 2

Model 2 includes the independent variables from Model 1 with the addition of first-generation status. This study utilized BYU’s definition of first-generation status defined as neither parent received an associates or higher college degree and was used as one potential demographic variable.

Model 3

Model 3 incorporates pre-college predictors including ACT score, HSGPA, and course information for AP courses with content integral to the course. Table 2 includes information on the mean and standard deviation with a minimum and maximum score for ACT, HSGPA and AP courses taken. It should be noted that no student took all five of the AP courses investigated. This could be due to lack of interest or limited accessibility.

Table 2

Descriptive Statistics on Pre-College Predictors

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Score</td>
<td>28.44</td>
<td>3.67</td>
<td>13</td>
<td>36</td>
</tr>
<tr>
<td>High School GPA</td>
<td>3.84</td>
<td>0.21</td>
<td>1.83</td>
<td>4</td>
</tr>
<tr>
<td>AP Courses Taken</td>
<td>0.57</td>
<td>0.81</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

As previously mentioned, the American Heritage curriculum was designed to be interdisciplinary, including a variety of principles found in Economics, History, and Political Science. Similarly, student enrollment in an interdisciplinary mix of five AP courses is investigated in this study. Efforts were taken to use courses that should include material and content important in the American Heritage course. The five courses ultimately chosen included United States History, European History, Government and Politics - United States, Microeconomics, and Macroeconomics.
**Model 4**

The inclusion of survey responses to the Student-Life Stress Inventory (Gadzella, 1994) is the adjustment in Model 4. The Student-Life Stress Inventory (Gadzella, 1994) was used to analyze student stress levels in four performance-predicting areas. In addition, Fall 2019 included questions on the physical and mental health of enrolled students. This optional survey was sent at the beginning of each semester through email. Across the two semesters, the survey was sent to a total of 3,192 students enrolled in American Heritage.

In addition to questions from the Student-Life Stress Inventory, Fall 2019 students were also asked one general question regarding the students’ perception of their physical and mental health. The second category—stressors—was obtained through a survey using a five-point, Likert scale (1= Never, 2= Seldom, 3= Occasionally, 4= Often, 5= Almost all the time). The survey instrument is listed in Appendix C.

To understand the stress experienced by students, a voluntary survey was sent to every student registered for the course. A total of 1,610 students took the survey, with a 34.4% response rate in Winter 2019 and a 57.6% response rate in Fall 2019. Twenty-three questions from the Student-Life Stress Inventory SLSI (Gadzella, 1994) were sent to all students via the email address on record with the university. In this paper’s study, five unique constructs were included in the 23 questions and included frustrations, conflicts, pressures, changes, and self-imposed. The SLSI has been shown to be a reliable (Table 3) and valid measure of students’ stress. An alpha coefficient score range of .63 to .86 was reported by Gadzella and Baloglu in a

---

3 Self-reported measures of physical and mental health were only provided for survey participants in Fall 2019.
4 Do you have an ongoing or serious health condition that requires frequent medical care or considerations --for example, regular doctor visits, daily medications, or the use of a medical or mobility device? Check all that apply: (Physical Health, Mental Health, Don’t Know, Neither).
A 2004 study comparing academic stress in American and international students also indicated reliability (Misra & Castillo, 2004). Consent was obtained prior to completion of the survey and students were allowed to exit the survey at any time. Three of Gadzella's original questions were removed: "I like to compete and win," "I like to be noticed and loved by all," and "I have a tendency to procrastinate" to increase construct reliability. More consistency exists between items that were left in the measure rather than those left out (Cronbach’s $\alpha = .55$ original sample, Cronbach’s $\alpha = .61$ after removal of three items).

**Table 3**

*Internal Consistency of the Student-Life Stress Inventory (Cronbach’s $\alpha$)*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Gadzella, 1994</th>
<th>Misra, 2004</th>
<th>Current Study, Full Inventory</th>
<th>Current Study, Revised Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frustrations</td>
<td>0.52</td>
<td>0.65</td>
<td>0.71</td>
<td>0.71</td>
</tr>
<tr>
<td>Conflicts</td>
<td>0.64</td>
<td>0.63</td>
<td>0.65</td>
<td>0.65</td>
</tr>
<tr>
<td>Pressures</td>
<td>0.73</td>
<td>0.71</td>
<td>0.69</td>
<td>0.69</td>
</tr>
<tr>
<td>Changes</td>
<td>0.85</td>
<td>0.75</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Self-Imposed</td>
<td>0.63</td>
<td>0.63</td>
<td>0.55</td>
<td>0.61</td>
</tr>
</tbody>
</table>

**Model 5**

The final model examined in this study analyzes how course-related variables – assigned TA, Review Room attendance, lecture enrollment, and study group course enrollment – impact student performance.

**Assigned TA**

To verify that class scores were influenced by variables included in the study, models were run to account for individual TAs using a dummy variable created for each TA. There was no significance in the TA assigned to the student section in the final percentage score.
**Review Room**

An area has been designated for American Heritage students to meet with each other and TAs individually or in small groups. This allows students additional support in a challenging, large class (Seifert et al., 2010). Attendance is tracked voluntarily but requested at check-in. The importance of such enrichment services has been recognized by the American Heritage faculty. Their financial and academic support of the Review Room is in part to provide meaningful interactions for students registered for this large lecture course (Tien et al., 2002).

**Cooperative Learning**

In addition to research on demographic characteristics and pre-college predictors, certain course-related variables were also examined. Of particular interest was Review Room attendance and a pilot study group course that was introduced by the faculty. Previous research on course related variables, such as lecture size, TA assigned, review room visits, and optional participation in a study group course is not available. The final model of this study, with its related variables of course related materials, would be considered new, exploratory research and while it may not be generalizable to all general education courses, implications may generate original suggestions for future practice.

**Study Group Course**

During the Winter 2019 semester, a pilot study group course (POLI 319R) was introduced as an optional, one credit course for students registered in American Heritage. This practice continued into the Fall 2019 semester. This interdisciplinary course was created in part to provide an opportunity for students to interact and work together on challenging American Heritage course concepts (Hammond et al., 2010), using specific protocols and structure (Arendale, 2014).
Given the nature of American Heritage enrollment, fewer students sign-up for winter semesters, resulting in decreased enrollment numbers. This pattern held true for the Winter 2019 and Fall 2019 semesters; Fall 2019 had much higher enrollment overall. Review room attendance was calculated by an electronic check-in system as students visited a room dedicated to American Heritage located at the campus library. This variable measured the total number of visits by students in each semester. Teaching Assistants (TAs) and course administration were available in the review room for students to request help with the course. Along with that, hourly recitations of material were also provided. Visiting this room was entirely voluntary on the part of enrolled students.

Balance tests were conducted on the study group course participation in order to measure possible selection bias. The balance tests were used to determine differences in students that took the optional study group course and those that did not; Chi-square and Fisher’s Exact tests for dichotomous variables (see Table 4) and independent samples t-tests for continuous variables (see Table 5) were used. Results indicated that while the students who did and did not take the study group course are not completely equivalent with respect to gender or race, the difference between the study group participants and other students in American Heritage is so small as to be substantively insignificant (Cohen, 2013). The difference for two variables (athlete and Canadian) were not tested because of small sample size (N=1 for both variables in one semester and was small for both in the other).

The effect sizes for the t-tests were calculated using Cohen’s $d$. Statistical significance was evident only in Fall 2019 (Cohen’s $d$ for HSGPA = .175 ($p$<.01) and Cohen’s $d$ for ACT = .127 ($p$<.05)). These relationships fall below Cohen’s benchmark of .2 for small effects (Cohen, 2013). Large sample size led to statistically significant differences, but small differences in
practical terms between the two groups. Given the sample size, and the flawed nature of t-tests in large samples, literature suggests using effect size as a benchmark (Wainer & Robinson, 2003). Overall, the independent samples t-tests demonstrate that students who took the optional study group course were not substantively different when compared to those students who did not take the course.

Table 4

Balance Tests: Chi-Square Analysis of Enrollment in Study Group Course

<table>
<thead>
<tr>
<th></th>
<th>Winter 2019</th>
<th></th>
<th>Fall 2019</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Chi-Square</td>
<td>Fisher’s Exact</td>
<td>N</td>
</tr>
<tr>
<td>Female</td>
<td>136</td>
<td>8.148**</td>
<td>0.005</td>
<td>269</td>
</tr>
<tr>
<td>Mission(^a)</td>
<td>52</td>
<td>3.872</td>
<td>0.049</td>
<td>94</td>
</tr>
<tr>
<td>LDS(^b)</td>
<td>201</td>
<td>4.134</td>
<td>0.076</td>
<td>397</td>
</tr>
<tr>
<td>Canadian</td>
<td>1</td>
<td>0.445</td>
<td>0.692</td>
<td>4</td>
</tr>
<tr>
<td>Mixed(^c)</td>
<td>105</td>
<td>0.009</td>
<td>1</td>
<td>236</td>
</tr>
<tr>
<td>Native or Alaskan American</td>
<td>3</td>
<td>0.863</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Black</td>
<td>6</td>
<td>0.427</td>
<td>0.62</td>
<td>7</td>
</tr>
<tr>
<td>Asian or Asian American</td>
<td>31</td>
<td>1.627</td>
<td>0.273</td>
<td>42</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>5</td>
<td>0.015</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>White</td>
<td>745</td>
<td>0.180</td>
<td>0.76</td>
<td>1,892</td>
</tr>
</tbody>
</table>

Note. Standard error in parenthesis *** p<0.01 and ** p<0.05
\(^a\) Mission refers to returned missionary status.
\(^b\) LDS refers to members of The Church of Jesus Christ of Latter-day Saints (the sponsoring organization).
\(^c\) Mixed refers to students that identified as more than one race.
Table 5

Balance Tests: Independent T-Tests of Enrollment in Study Group Course

<table>
<thead>
<tr>
<th></th>
<th>Winter 2019</th>
<th>Fall 2019</th>
<th></th>
<th>Winter 2019</th>
<th>Fall 2019</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean of</td>
<td>Mean of</td>
<td>Difference</td>
<td>Mean of</td>
<td>Mean of</td>
<td>Difference</td>
</tr>
<tr>
<td></td>
<td>non-Study</td>
<td>Study</td>
<td></td>
<td>non-Study</td>
<td>Study</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>Group</td>
<td></td>
<td>Group</td>
<td>Group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Course</td>
<td>Course</td>
<td></td>
<td>Course</td>
<td>Course</td>
<td></td>
</tr>
<tr>
<td>Household Income</td>
<td>9.251</td>
<td>9.12</td>
<td>0.13</td>
<td>9.22</td>
<td>9.27</td>
<td>-0.05</td>
</tr>
<tr>
<td>ACT Score</td>
<td>28.66</td>
<td>28.24</td>
<td>0.42</td>
<td>28.47</td>
<td>28.01</td>
<td>0.46**</td>
</tr>
<tr>
<td>High School GPA</td>
<td>3.82</td>
<td>3.85</td>
<td>-0.03</td>
<td>3.83</td>
<td>3.87</td>
<td>-0.03**</td>
</tr>
<tr>
<td>Number of AP Courses</td>
<td>0.574</td>
<td>0.60</td>
<td>-0.29</td>
<td>0.57</td>
<td>0.57</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Note. Standard error in parenthesis *** p<0.01 and ** p<0.05

Results

Tables 6 and 7 provide the coefficients, standard errors, and standardized coefficients for all variables in Models 1-5. Pacific Islander was omitted in all Winter 2019 models as there were no participants in this demographic group. Model 4 does not include the eight non-LDS students in the sample, as these participants were missing observations. Students were also dropped if they didn’t designate a race category.
Table 6

Regression Results: Student Demographics, First Generation Status, and Pre-College Predictors

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Student Demographics)</td>
<td>(FGS)</td>
<td>(Pre-College Predictors)</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fall</td>
<td>Winter</td>
</tr>
<tr>
<td>Female</td>
<td>-0.014</td>
<td>0.005</td>
<td>-0.013</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.009)</td>
<td>(0.006)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.057</td>
<td>0.021</td>
<td>-0.055</td>
</tr>
<tr>
<td>Mission</td>
<td>0.015</td>
<td>0.024***</td>
<td>0.011</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.010)</td>
<td>(0.007)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.061</td>
<td>0.083</td>
<td>0.045</td>
</tr>
<tr>
<td>LDS</td>
<td>-0.030</td>
<td>0.029</td>
<td>-0.037</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.057)</td>
<td>(0.040)</td>
<td>(0.057)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.020</td>
<td>0.016</td>
<td>-0.023</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.065**</td>
<td>-0.071***</td>
<td>-0.038</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.027)</td>
<td>(0.017)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.078</td>
<td>-0.085</td>
<td>-0.046</td>
</tr>
<tr>
<td>Black</td>
<td>-0.161***</td>
<td>-0.098</td>
<td>-0.168***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.052)</td>
<td>(0.062)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.104</td>
<td>-0.033</td>
<td>-0.108</td>
</tr>
<tr>
<td>Mixed-Race</td>
<td>-0.048***</td>
<td>-0.047***</td>
<td>-0.044***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.012)</td>
<td>(0.009)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.131</td>
<td>-0.112</td>
<td>-0.120</td>
</tr>
<tr>
<td>Native or Alaskan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>-0.198***</td>
<td>-0.054</td>
<td>-0.165**</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.065)</td>
<td>(0.055)</td>
<td>(0.065)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.100</td>
<td>-0.020</td>
<td>-0.082</td>
</tr>
<tr>
<td>Asian American</td>
<td>-0.051**</td>
<td>-0.044**</td>
<td>-0.042*</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.022)</td>
<td>(0.021)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.076</td>
<td>-0.043</td>
<td>-0.063</td>
</tr>
<tr>
<td>Hawaiian/Pacific</td>
<td>-0.023</td>
<td>-0.030</td>
<td>-0.016</td>
</tr>
<tr>
<td>Islander</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawaiian</td>
<td>(0.051)</td>
<td>(0.123)</td>
<td>(0.050)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.015</td>
<td>-0.005</td>
<td>-0.010</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>-0.156***</td>
<td>-0.117***</td>
<td>-0.117***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.041)</td>
<td>(0.041)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.078</td>
<td>-0.058</td>
<td></td>
</tr>
<tr>
<td>Athlete</td>
<td>-0.051</td>
<td>-0.143***</td>
<td>-0.047</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.033)</td>
<td>(0.019)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.054</td>
<td>-0.162</td>
<td>-0.050</td>
</tr>
<tr>
<td></td>
<td>Model 1 (Student Demographics)</td>
<td>Model 2 (FGS)</td>
<td>Model 3 (Pre-College Predictors)</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------</td>
<td>---------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fall</td>
<td>Winter</td>
</tr>
<tr>
<td><strong>Canadian</strong></td>
<td>0.002</td>
<td>0.022</td>
<td>0.017</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.051)</td>
<td>(0.042)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.002</td>
<td>0.016</td>
<td>0.014</td>
</tr>
<tr>
<td><strong>Estimated Household Income</strong></td>
<td>0.002</td>
<td>0.003***</td>
<td>0.001</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.053</td>
<td>0.065</td>
<td>0.033</td>
</tr>
<tr>
<td><strong>First Generation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.063***</td>
<td>-0.058***</td>
<td>-0.019</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.013)</td>
<td>(0.009)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.162</td>
<td>-0.138</td>
<td>-0.049</td>
</tr>
<tr>
<td><strong>ACT Score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.290</td>
<td>0.322</td>
<td></td>
</tr>
<tr>
<td><strong>HSGPA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.019)</td>
<td>(0.013)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.227</td>
<td>0.313</td>
<td></td>
</tr>
<tr>
<td><strong>AP Courses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.093</td>
<td>0.100</td>
<td></td>
</tr>
<tr>
<td><strong>Regression Model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.822***</td>
<td>0.757***</td>
<td>0.840***</td>
</tr>
<tr>
<td>Standard Error</td>
<td>(0.058)</td>
<td>(0.042)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>Observations</td>
<td>904</td>
<td>2,228</td>
<td>904</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.067</td>
<td>0.073</td>
<td>0.091</td>
</tr>
</tbody>
</table>

**Note.** *** p<0.01, ** p<0.05, * p<0.1
### Table 7

**Regression Results on Stressors and Course Related Variables**

<table>
<thead>
<tr>
<th></th>
<th>Model 4 (Stressors)</th>
<th></th>
<th>Model 5 (Course-Related Variables)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winter</td>
<td>Fall</td>
<td>Winter</td>
<td>Fall</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>-0.050***</td>
<td>-0.002</td>
<td>-0.016**</td>
<td>-0.007</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.014)</td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.231</td>
<td>-0.011</td>
<td>-0.070</td>
<td>-0.026</td>
</tr>
<tr>
<td><strong>Mission</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.014)</td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LDS</strong></td>
<td>-</td>
<td>0.022</td>
<td>-0.071</td>
<td>0.009</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.044)</td>
<td>(0.054)</td>
<td>(0.034)</td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td></td>
<td></td>
<td>-0.042</td>
<td>0.005</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td>-0.167**</td>
<td>0.0004</td>
<td>-0.008</td>
<td>-0.016</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.067)</td>
<td>(0.021)</td>
<td>(0.026)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.130</td>
<td>0.001</td>
<td>-0.009</td>
<td>-0.019</td>
</tr>
<tr>
<td><strong>Black</strong></td>
<td>-</td>
<td>-0.008</td>
<td>-0.065</td>
<td>-0.010</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.057)</td>
<td>(0.051)</td>
<td>(0.050)</td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td></td>
<td></td>
<td>-0.038</td>
<td>-0.004</td>
</tr>
<tr>
<td><strong>Mixed-Race</strong></td>
<td>0.004</td>
<td>-0.006</td>
<td>-0.026**</td>
<td>-0.012</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.019)</td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.012</td>
<td>-0.016</td>
<td>-0.073</td>
<td>-0.027</td>
</tr>
<tr>
<td><strong>Native or Alaskan American</strong></td>
<td>0.003</td>
<td>-0.006</td>
<td>-0.097*</td>
<td>-0.031</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.094)</td>
<td>(0.054)</td>
<td>(0.057)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.001</td>
<td>-0.003</td>
<td>-0.050</td>
<td>-0.012</td>
</tr>
<tr>
<td><strong>Asian American</strong></td>
<td>-0.040</td>
<td>-0.025</td>
<td>-0.045**</td>
<td>-0.027</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.035)</td>
<td>(0.023)</td>
<td>(0.020)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.065</td>
<td>-0.027</td>
<td>-0.068</td>
<td>-0.026</td>
</tr>
<tr>
<td><strong>Hawaiian/Part Hawaiian</strong></td>
<td>0.096</td>
<td>-</td>
<td>0.040</td>
<td>0.016</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.088)</td>
<td>(0.049)</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.053</td>
<td>-0.044</td>
<td>0.024</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Pacific Islander</strong></td>
<td>-</td>
<td>-0.184***</td>
<td>-</td>
<td>-0.093***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.043)</td>
<td>(0.033)</td>
<td>(0.033)</td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td></td>
<td>-0.103</td>
<td>-0.048</td>
<td></td>
</tr>
<tr>
<td><strong>Athlete</strong></td>
<td>0.007</td>
<td>-0.104***</td>
<td>-0.006</td>
<td>-0.050***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.046)</td>
<td>(0.028)</td>
<td>(0.016)</td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.007</td>
<td>-0.113</td>
<td>-0.006</td>
<td>-0.059</td>
</tr>
<tr>
<td></td>
<td>Winter</td>
<td>Fall</td>
<td>Winter</td>
<td>Fall</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Model 4</strong> (Stressors)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian</td>
<td>0.047</td>
<td>-0.002</td>
<td>-0.008</td>
<td>0.016</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.073)</td>
<td>(0.099)</td>
<td>(0.051)</td>
<td>(0.055)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.036</td>
<td>-0.001</td>
<td>-0.006</td>
<td>0.006</td>
</tr>
<tr>
<td>Estimated Household Income</td>
<td>0.003</td>
<td>0.002**</td>
<td>0.000</td>
<td>0.002**</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.080</td>
<td>0.057</td>
<td>-0.002</td>
<td>0.044</td>
</tr>
<tr>
<td>First Generation</td>
<td>-0.031</td>
<td>-0.031***</td>
<td>-0.007</td>
<td>-0.002</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.020)</td>
<td>(0.011)</td>
<td>(0.012)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.084</td>
<td>-0.075</td>
<td>-0.018</td>
<td>-0.004</td>
</tr>
<tr>
<td>ACT Score</td>
<td>0.009***</td>
<td>0.011***</td>
<td>0.010***</td>
<td>0.012***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.286</td>
<td>0.328</td>
<td>0.305</td>
<td>0.349</td>
</tr>
<tr>
<td>HS GPA</td>
<td>0.144***</td>
<td>0.148***</td>
<td>0.116***</td>
<td>0.171***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.030)</td>
<td>(0.016)</td>
<td>(0.018)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.260</td>
<td>0.240</td>
<td>0.205</td>
<td>0.270</td>
</tr>
<tr>
<td>AP Courses</td>
<td>0.013*</td>
<td>0.018***</td>
<td>0.013***</td>
<td>0.015***</td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.007)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.100</td>
<td>0.128</td>
<td>0.095</td>
<td>0.101</td>
</tr>
<tr>
<td>Mental Health</td>
<td></td>
<td>-0.031***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.010)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td></td>
<td>-0.081</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Health</td>
<td></td>
<td>-0.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.011)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td></td>
<td>-0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frustrations</td>
<td>-0.013</td>
<td>-0.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.009)</td>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.095</td>
<td>-0.047</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflicts</td>
<td>0.010</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.008)</td>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.072</td>
<td>0.018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressures</td>
<td>0.023***</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.008)</td>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.178</td>
<td>0.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes</td>
<td>-0.002</td>
<td>-0.006*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.008)</td>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>-0.019</td>
<td>-0.048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-imposed</td>
<td>0.001</td>
<td>0.012***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Err.</td>
<td>(0.009)</td>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stdzd. Coeff.</td>
<td>0.008</td>
<td>0.074</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Model 1

\[ Y_i = \beta_0 + \beta_1 D_i + \epsilon_i \]  

Model 1 focused on demographic variables. \( Y_i \) represents the learning outcomes designated by the student’s final score in the course. The vector \( D_i \) comprises all demographic variables: sex, Mission, LDS, Race, Athlete Status, Canadian status, and estimated household income. In Winter 2019 (\( n = 904, R^2 = .067 \)), five distinct demographic characteristics were the only statistically significant variables, and, as such, are all in some degree predictive of the students’ final American Heritage percentage score: Hispanic, Black, Mixed-Race, Native or Alaskan American, and Asian American. Of the significant predictors from Winter 2019, the following were also significant for the Fall 2019 (\( n = 2,228, R^2 = .073 \)) semester: Hispanic, Mixed-Race, and Asian American. Additionally, the demographic variables that were significant only in Fall 2019 were the following: mission status (2% increase in final score), Pacific
Islander, student athlete (15.6% lower in final score and 14.3% lower in final score respectively),
and estimated household income (.3% increase in final score) for every $10,000 increase.

**Model 2**

\[ Y_i = \beta_0 + \beta_1 FGS_i + \beta_2 D_i + \epsilon_i \] (2)

Model 2 kept the demographic variables (\(D_i\)) and added \(FGS_i\) a binary variable
representing self-identified parental educational level. \(Y_i\) represents the learning outcomes
designated by final score. In Winter 2019 (\(R^2 = .091\)) students that self-identified as FGS showed
statistical significance (p<0.01) and on average scored 6.3% lower than their non-FGS peers.

Variables that continued to be statistically significant from Model 1 to Model 2 included Black,
Mixed-Race, Native or Alaskan American, and Asian American.

In Fall 2019 (\(R^2 = .091\)), students that self-identified as FGS on average scored 5.8%
lower than their non-FGS peers (p<0.01). Variables that continued to be statistically significant
from Model 1 to Model 2 included mission, Hispanic, Mixed-Race, Asian American, Pacific
Islander, athlete status, and estimated household income. One new variable of significance in
Model 2 for Fall 2019 included students identifying as Black.

**Model 3**

\[ Y_i = \beta_0 + \beta_1 P_i + \beta_2 F_i + \beta_3 D_i + \epsilon_i \] (3)

Model 3 focused on pre-college predictors (\(P_i\)), while keeping FGS (\(F_i\)), and
demographic variables (\(D_i\)). \(Y_i\) represents the learning outcomes designated by final score. The
vector \(P_i\) includes pre-college predictors: ACT Score, HSGPA, and number of applicable AP
Courses. Model 3 in Winter 2019 (n=857, \(R^2 = .256\)) resulted in several statistically significant
variables: Mixed-Race, Asian American, ACT Score, HSGPA, and AP Courses taken. In terms
of the additional variables included in this model, a one-point increase in ACT score (e.g., from
28 to 29) was associated with a 1.0% increase in final percentage score, a one-point increment increase in HSGPA (e.g., from 2.5 to 3.5) was associated with a 12.8% increase in final percentage score, and each additional course-applicable AP course taken was associated with a 1.3% increase in final percentage score, all controlling for other variables included in the model (p<0.01).

For the Fall 2019 analysis (n = 2,072, $R^2 = .341$) all three additional student-level predictors resulted in statistically significant explanations to the model. The Fall 2019 model resulted in several statistically significant variables: mission, Mixed-Race, Pacific Islander, athlete status, estimated household income, ACT Score, HSGPA, and AP Courses taken. A one-point increase in ACT score was associated with a 1.1% increase in final percentage score, a one-point increment increase in HSGPA was associated with a 19.9% increase in final percentage score, and each additional course-applicable AP course taken was associated with a 1.5% increase in final percentage score, all controlling for other variables included in the model (p<0.01).

**Model 4**

$$Y_i = \beta_0 + \beta_1 S_i + \beta_2 P_i + \beta_3 F_i + \beta_4 D_i + \epsilon_i$$

(4)

Model 4 focused on stress ($S_i$), and included pre-college predictors ($P_i$), FGS ($F_i$) status, and demographic variables ($D_i$). $Y_i$ represents the learning outcomes designated by final score. The $S_i$ vector includes frustrations, conflicts, pressures, changes, and self-imposed. Fall 2019 also includes one question each on mental and physical health. Model 4 in Winter 2019 (n=290, $R^2 = .387$) resulted in several statistically significant variables: sex, Hispanic, ACT score, and HSGPA. One stressor that was statistically significant was pressures ($p=.003$). The pressure construct included questions related to competition, deadlines, overload, and interpersonal
relationships including expectations and work responsibilities. A one standard deviation increase in the stressor category *pressures* is related to a .178% standard deviation increase in the final grade percentage. Religion status, Black, and Pacific Islander were omitted due to collinearity (driven primarily by the small sample sizes for these groups in this model). Survey questions on self-reported mental and physical health were included in the survey given in the Fall 2019 semester based on faculty recommendation.

Fall 2019 (n = 1,176, $R^2 = .371$) resulted in a new statistically significant stressor: *self-imposed* ($p=.009$). This construct included questions regarding worries about others, finding perfect solutions, and anxiety when taking exams. Increases in the stressor category *self-imposed* resulted in a .074% standard deviation increase in the final grade percentage, indicating that mild stress may be useful to students (Gadzella et al., 2012). This increase could be related to factors such as increased conscientiousness and higher motivation which could result in higher reported levels of pressure and self-imposed stressors. The new question on the survey regarding mental health was also significant ($p=.001$). If a student indicated they were experiencing serious ongoing mental health concerns it was associated with a 3.1% decrease in their final percentage score, controlling for other variables included in the model. Other statistically significant variables were mission status, Pacific Islander, student athlete, estimated household income, FGS, ACT score, HSGPA, and number of AP classes taken.

**Model 5**

$$ Y_i = \beta_0 + \beta_1 C_i + \beta_2 P_i + \beta_3 F_i + \beta_4 D_i + \epsilon_i $$ (5)

Model 5 focused on course related variables ($C_i$), pre-college predictors ($P_i$), FGS status ($F_i$), and demographic variables ($D_i$). $Y_i$ represents the learning outcomes designated by final score. The $C_i$ vector is comprised of lab size, lecture size, review room visits, and enrollment in
the study group course. Model 5 in Winter 2019 (n = 857, \( R^2 = .322 \)) resulted in eight statistically significant variables: sex, Mixed-Race, Asian American, ACT score, HSGPA, number of AP courses, review room visits, and participation in the study group course. Being female, Mixed-Race, or Asian American resulted in a lower final percentage score (1.6%, 2.6%, 4.5% respectively) controlling for other included variables (p<.05). A one-point increase in ACT, a one-point increase in HSGPA, and a one-unit increase in the number of course-applicable AP courses resulted in higher final percentages (1.0%, 11.6%, and 1.3% respectively) controlling for other variables included in the model (p<.05). For each visit to the review room a student’s final percentage, on average, would increase by 0.3% (p<.01). While this number may seem small, substantively it could make a significant difference on a student’s overall percentage as 957 students attended the review room with a total of 7,632 visits amongst them. Participation in the official study group course was associated with a 1.6% increase in final percentage grade (p<.05).

Fall 2019 (n = 2072, \( R^2 = .407 \)) resulted in eight statistically significant variables as well: Pacific Islander, student-athlete, estimated household income, ACT score, HSGPA, number of AP courses, review room visits, and participation in the study group course. While lecture size was considered statistically significant in the final output, the results were so small as to be substantively insignificant and therefore will not be discussed at length. Being a Pacific Islander or a student athlete resulted in a lower final percentage score (9.3% and 5.0% respectively) while controlling for other variables in the model (p<.01). A one-point increase in ACT, a one-point increase in HSGPA, a one unit increase in the number of course-applicable AP Courses, and an increase in estimated household income resulted in higher final scores (1.2%, 17.1%, and 1.5% (p<.01), and .2% (p<.05), respectively). For each visit to the review room a student’s final
percentage, on average, would increase by .4% (p<.01). Similar to Winter 2019, while this number may seem small, 1,607 students attended the review room with a total of 11,022 visits amongst them in Fall 2019 -- potentially increasing a student’s final percentage significantly. Participation in the official study group course resulted in a 2.2% increase in final percentage score (p<.01).

**Discussion**

This study intended to analyze a variety of variables to see which, if any, were predictive of performance in a large, general education course. Overall, pre-college predictors and course-related variables were significant and robust in predicting performance in the course. This aligns with the literature previously reviewed on the role of standardized exams, HSGPA, and AP classes in admission policies and college performance (Allensworth & Clark, 2020; Berry & Sackett, 2009; Bettinger et al., 2013; Geiser & Santelices, 2007; Zwick, 2017). Review room attendance and participating in the optional study group were significant across both semesters. On average, each visit to the review room increased a student’s final score by .35% and enrollment in the study group course increased the final score by 1.9%. It is possible that selection bias could have heavily influenced these scores (Fischer, 2007). Students had to be aware of the optional review room location, hours, and have time available to attend.

While pre-college predictors and course characteristics played a consistent and important role in predicting course outcomes, they do not fully explain student performance. As previous research has indicated, confounding variables such as secondary school quality, number and variety of AP classes available, and parental involvement can influence standardized test scores and HSGPAs, particularly for minority and low-SES students (Perna & Titus, 2005; Dennis et al., 2005; Fischer, 2007; Liu, 2011; Mijs, 2016). Attention should be given to the variables
significant in Models 1-3 for a more complete understanding of the underlying role they may play in the significance of the variables in Models 4-5.

As stated earlier, it is important to keep in mind that results from Model 5 may not be independent of demographics – there might be some relationships between self-identified race and ACT, HSGPA, and AP courses; but even when controlling for race and other demographics, there is still predictive value in these pre-college variables.

While inconsistent across the semesters, the findings in Models 1-3 regarding race are problematic but not surprising. For example, in Model 1, students that identified as Black scored 16.1% lower on the final score than their white peers in Winter 2019. The same trend was consistent with Model 2 where Black students scored 16.8% lower. This could be partially due to a lack of review room attendance. Black students had an average of 1.74 visits to the review room for Winter 2019 and 2.789 for Fall 2019; however, only one Black student visited the review room more than 10 times Winter 2019, and 2 Black students came in over 10 times during the Fall 2019 semester. In comparison, for all enrolled students the average review room attendance was 5.04 visits per student in the Winter 2019 semester and 4.83 for the Fall 2019 semester. Students who identified as Pacific-Islander, although only studied during the Fall 2019 semester, also had statistically significant lower scores in Models 1-3, scoring 15.6%, 11.7%, and 9.7% lower than their white peers in each respective model. A 2017 study conducted by Flores et al. argued that under-represented minority students come to postsecondary institutions with different levels of academic preparation and often at an economic disadvantage. It could be posited that, based on this information, general education courses could evaluate what systems could be implemented to supplement academic courses in predominantly first year classes.
The significance of FGS in Models 2-3 was not unexpected. Students that identified as first generation had a final score that was 6% lower than their peers in Winter 2019 and Fall 2019. Other researchers have concluded that FGS have less communication with family regarding the college experience resulting in less social support, less interactions with faculty, and are more likely to have lower first semester grades than their non-FGS peers (Covarrubias et al., 2018; Nuñez, 2011; Palbusa & Gauvain, 2017). As the literature has indicated, FGS students may not have been as comfortable attending the optional review room. In Winter 2019 FGS averaged 3.13 visits to the review room and averaged 3.88 for Fall 2019. Similar to the pattern seen in Black students, a few FGS came multiple times while the majority never came to the review room.

The significance of athlete status in the data could be a factor of sample size. Fourteen student athletes registered for the course Winter 2019 and 48 registered in Fall 2019. Many coaches and advisors for student athletes suggest taking American Heritage in the “off season.” The rigorous reputation of the course has implicitly encouraged many student athletes to take the course when more time can be given to academic studies even though supports, such as tutors and tracking of academic progress are provided at a university level for student athletes. The largest teams on campus have the fall semester as their “in season” semester. Student athletes taking the course during the Fall may be at a disadvantage if they are in season. Every Fall semester student athlete status was statistically significant ranging from 14.3%, 14.1%, 6.1%, 10.4%, and 5.0% lower scores in each model than their non-student athlete peers.

Students that had served a voluntary mission show statistically significant improvements in Models 1-4 in the Fall 2019 semester and to a lesser degree in Model 5 in the winter semester. While this is worth noting, the research design does not allow us to parse out the
mechanisms behind the significance. While academic skills could have been learned from the mission experience and or the maturity of the student, it could as easily be explained by selection bias. Students that have been successful in the religious culture of a mission may have that same success in the similar (but to a lesser degree) culture on campus.

**Conclusion**

The intent of this study was to be exploratory and identifying in nature. Using the findings from this research, faculty and administrators in large general education courses presently have some conclusive data on which to base future decisions in course design. Based on the literature and supported by this study’s data the following measures could be implemented to improve student performance in this or other large general education courses:

1. Focusing on hiring qualified TAs from diverse racial groups. Data from the study indicated students of color not performing as expected given pre-college predictors. Hiring diverse TAs could encourage a sense of belonging in the review room for students of color. In addition, having a diverse group of TAs would provide students proximal relationships with students of color that have successfully completed the course and are now in teaching positions.

2. Investigating how course curriculum, including language and cultural references, might align with the White American (and possibly male) experience, thereby potentially disadvantaging certain student groups. First-generation students, and any other marginalized student group, could benefit from an evaluation of course material. Course material may be taught in such a way that it is not accessible to certain student groups and their life experiences.
3. Incorporating training on inclusion and race for faculty, administration, and TAs. Training could inform teaching practices and material that could be incorporated to support all students’ performance.

4. Creating structures to support identified, disadvantaged groups. For example, review room hours specifically to support FGS, student athletes, and international students. Data indicated that students of color and FGS were not attending the review room with the frequency of their white counterparts. Providing ways to make students aware of and comfortable accessing academic supports specific to the course would be imperative.

5. Working with the student athlete and other advisement centers to implement a required, peer-led, study group course for student athletes both NCAA and extramural. Student athlete status was associated with a decrease in final course score. Providing additional supports could benefit not only their performance in the course but their feelings of competency and academic belonging (Nunn, 2021).

6. Creating optional times (evening) and formats (online) to allow more students access to the review room resources. Often, FGS are required to work off campus and/or may have familial duties that could interfere with accessing academic supports in a typical school day (Bozick, 2007; Walpole, 2003). Providing optional times and formats would allow them access at times convenient for their unique schedules.

7. Incorporating aspects of a peer-led, study group course into the general course and/or continue offering the optional, study group course. Allowing students the opportunity to study and examine course concepts together could improve individual understanding and course performance (Johnson et al., 1998, Nunn, 2021).
Given the significance of race, FGS status, student athlete status, pre-college predictors, and course related variables certain suggestions for increased learning and course performance seem warranted. Many suggestions could also be broadly applicable to varied courses at other universities. Other classes could benefit from providing students access to a review room or lab where not only recitations but access to trained teaching assistants is available. Peer-led study group courses aligned with course content could also be beneficial for at risk students. Improved accessibility by allowing optional times and formats for students to be engaged in a course could improve student performance.

There are several avenues for further research based on this exploratory study. Other variables that could be associated with predicting student performance warrant some attention. Analysis of the role of secondary institutions on course performance would be interesting. Do certain high schools (or geographic regions) do a better job at preparing students for American Heritage? What makes the difference? Exploration into the non-cognitive variable of belonging could further inform practice in a course with implications for a wider audience. Further research on attendance in an optional review room and peer-led, study group course would be valuable in providing supports for at risk students. Qualitative research could also focus on belonging and/or marginalized student experiences through focus groups, surveys, and interviews to provide valuable insight on improvements. For example, research on sense of academic, social group, or campus community belonging, discussion items in labs, diversity among TAs, and language used in the course could enrich our understanding of student experiences and performance outcomes.
References


APPENDIX A

Extended Review of the Literature

The following material is a review of the literature that was instrumental in writing this dissertation. The review will include an in-depth explanation of the course which will include various logistics significant to the course, anecdotal experiences which led to a recognition of a problem inherent in class performance, and a more detailed review of the literature to provide the reader with a better understanding of the framework, variables, and implications for further research and action items. This study examines variables based on demographics, stressor information, and enrollment in an optional study group course to parse out distinct group performance in a large general education course.

Pecuniary Benefits

The reasons for attending post-secondary institutions are as varied as the students and include motivations for future economic success (Corts & Stoner, 2011), family or cultural expectations, and specific career goals that can only be obtained with a college degree (Hout, 2012). Support has been given to the claim that a higher education degree is imperative, for example, statistics provided by ETS estimated that by 2020 more than 2/3 of all available jobs will require some level of higher education (Carnevale, Smith, et al., 2013). Even in the same industry, individuals with a college degree earn more than their counterparts with a high school diploma only (Ma et al., 2016). In the College Atlas 2014 report, the United States was highlighted as having the highest return on college education investment (College Atlas, 2014). In research conducted by Hout (2012), college graduates were less likely to be unemployed during a recession (the 2011 unemployment rate was 4.4% for college graduates and 8.5% for
high school graduates). Information provided by Carnevale, Jayasundara, et al., (2013) supports this claim. See Figure A1.

After the 2008 recession, workers with less education experienced 78% of total job loss. Individuals with at least a bachelor’s degree experienced job growth (Carnevale, Jayasundera, et al., 2013). Individuals with lower levels of education also experience shorter times of unemployment and higher lifetime earnings (Ma et al., 2016). Using data from a study conducted by the Georgetown University Center on Education and the Workforce, the average lifetime earnings by one holding a bachelor’s degree would be 84% higher than those of a high school graduate (Carnevale et al., 2011). Students that attend and graduate from college realistically expect economic returns (Brand & Xie, 2010).
Non-Pecuniary Benefits of Education

In addition to pecuniary benefits of education there are also non-pecuniary benefits. For example, individuals with a higher education are less likely to be heavy drinkers, less likely to be obese, more likely to wear seat belts, and more likely to receive preventative health care (Cutler & Lleras-Muney, 2010). Using a compilation of national data sets from the United States and the United Kingdom, Cutler and Lleras-Muney (2010) explored the causal relationship between years/level in education and outcomes. In summary they stated that “better educated people engage in more preventive and risk-control behavior” (p. 3). Additionally, individuals with higher levels of education are more involved citizens and parents (Ma et al., 2016; Oreopoulos & Salvanes, 2011). The statistics regarding civic engagement provide additional evidence; in 2015, 16% of adults (25+) with a high school diploma engaged in volunteer activities, while 39% of
adults with at least a bachelor’s degree engaged in volunteer activities (Ma et al., 2016). Putnam posits that civic engagement will improve not only the lives of individuals but communities through trust, citizen participation, and broadening the awareness that individuals’ futures are linked to others (Putnam, 2000).

**Economic Implications**

An argument has been developed that exhibits the importance of college retention. As the research has indicated, attendance in higher education is a valuable part of possible pecuniary and non-pecuniary benefits. While it is true that the economic expectation is greater for those that have at least a bachelor’s degree, real costs of college are manifest. Tuition, housing, fees, and books must be taken into consideration. Enrollment requires the student to postpone experiences in a career and potentially miss job opportunities (Oreopoulos & Petronijevic, 2013).

**Student Demographic Characteristics**

An extensive review of available literature was scrutinized in order to choose variables that had been used broadly in research in higher education and performance (Holmes & Slate, 2017). Demographic variables, such as, race, sex and FGS, in addition to others, were included in this study because they have been found to be important. Other variables specific to this study were included: pre-college predictors, stressors, and course-related variables.

Specific characteristics included in this study will help with the analysis and generalizability to future semesters. The benefits of a college education have previously been outlined but it should be noted that specific demographic characteristics play a significant role in educational outcomes, particularly race, socio-economic status (SES), and first-generation status.
Race

The college enrollment by students of color has increased nationwide (Espinosa et al., 2019; see Figure A2). The same percentages were not evident in this particular study; however, given documentation of obstacles students of color can face on campus at BYU (Goldsberry, 2020; Merkley, 2020) race was considered an important variable to investigate in regard to student performance.

Figure A2

Enrollment by Race and Ethnicity


In a short article, written by a BYU student studying Communication Studies, statistics from the BYU Multicultural office indicated that 1% of BYU students are Black or African American but 63% of those students do not graduate from BYU (Goldsberry, 2020). This issue is not site specific. In a study on college completion conducted in Texas, researchers also found a
racial college completion gap. Hispanic students were 12% less likely to complete college while Black student’s percentage gap was at 22%. Although this study was conducted specifically in Texas, the college completion gap percentages were similar to those at a national level (Flores et al., 2017). Higher education should be particularly concerned with the success of students of color as not only do they attend at lower rates, but the problem is confounded as they also graduate at lower rates.

First-Generation Students

In a study conducted by Ishitani (2003), the retention rate for FGS in the first semester was 9% less than students that came from a home with two college-educated parents. This rate increased over the course of the student’s college experience, and by the sixth semester, retention rates for FGS students were 22% lower than for their peers with two college-educated parents. FGS students were also 24.5% more likely to leave their college of first entry without attending any other college (Ishitani, 2006). Ishitani also found that FGS students were 51% less likely than their peers with college-educated parents to graduate in four years (2006). A variety of factors could influence the performance of FGS such as, lack of experience with college institutions with little to no guidance from parents (Cataldi et al., 2018; Holland, 2010) or outside familial or work pressures. Jury et al. (2017) stated, “Consequently, when exposed to university materials framed independently, first-generation students feel less comfort and fit, experience greater levels of stress, and ultimately do not perform up to their potential” (p. 30). In a 2017 study of community college students, Holmes and Slate found statistical significance in college GPAs for male and female FGS in relation to non-FGS (males - $\chi^2(3) = 27.32, p< .001$; females - $\chi^2 (3) = 194.69, p< .001$) (Holmes & Slate, 2017).
Social capital theory offers some insight as to why FGS students are less likely to experience academic success in higher education (Moschetti & Hudley, 2015). Bourdieu, Coleman, and Putnam, leading theorists on social capital, have helped to explain the value of human networks and relationships in a variety of settings including education.

Bourdieu was interested in the power and resources associated with social networks. In his view, social capital has a multiplier effect for the other forms of capital a student could possess (Bourdieu, 1986). Using this lens, social capital would be dependent on the relationships and networks of individual students. In contrast to Bourdieu, Coleman viewed social capital to also be conceptualized as part of the larger public social good. Using Coleman’s lens, social capital would be seen as individual relationships and networks that while benefiting one person could also prove favorable to the whole (Coleman, 1988). In his popular text, *Bowling Alone*, Putnam (2000) also emphasizes the importance of information flow; for students, information flow encompasses access to resources and opportunities intended to promote academic achievement. This study will use demographic information to analyze what Putnam to a degree asserts—that social capital can increase educational achievement at an individual level (2000). In the life of a college student, social capital could be viewed as another valuable resource (Horvat, 2001; Moschetti & Hudley, 2015).

The complexity of benefits illustrated by social capital are not exclusive to FGS. Any student not a member of the dominant social group may be at a disadvantage (Holland, 2010). Other characteristics including race may preclude the full benefits of social capital on college campuses (Baker & Robnett, 2012; Perna & Titus, 2005).
Non-Cognitive

Based on existing research, stress was the non-cognitive variable included in the study. A second variable of belonging, especially in regards to students of color and FGS would have been valuable. 2021 research by L. Nunn provided data examining the limited success these two students group have in academic and campus-community belonging. It is important to recognize that it is the responsibility of the academic institution to foster a sense of belonging and a lack of belonging is not shouldered by the individual student (Nunn, 2021). Further research could investigate the role belonging could play in predicting course performance.

Pre-College Predictors of College Achievement

This study is primarily concerned with identifying students who may be at risk of underperformance in a higher education setting by investigating demographics as well as pre-college predictors, stressors, and course related variables.

High School GPA

Pre-college predictors, standardized exam scores and high school GPA have long been used by admission programs when evaluating prospective students. In a 2006 study, Geiser and Santelices, using 79,785 freshmen admitted to the University of California public higher education system, modeled the predictive capacity of a variety of variables, including demographic and pre-college predictors. The variables HSGPA, SAT verbal, math, and writing test, parental education, family income, and school API rank ultimately accounted for 26.5% of the variance of college cumulative fourth year GPA. Their results found that HSGPA was the best predictor of college GPA with a predictive weight of .34 (Geiser & Santelices, 2007). Allensworth and Clark (2020) found that HSGPAs were a consistent predictor of college readiness; in testing the probability of college graduation based on HSGPA the researchers found
higher HSGPAs (between 3.5 and 3.75) to be associated with an increased likelihood of college graduation as compared to lower HSGPAs (between 3.0 and 3.25). The difference between the two groups was a 78% versus a 48% probability of graduation. The use of HSGPA as an admission tool is important given students’ future academic pursuits are often influenced by their HSGPA.

**Standardized Tests (ACT & SAT)**

Enrollment at most universities is based, in part, on ACT or SAT scores and HSGPAs; this study will include those as pre-college predictors, given there is a body of research that considers the use of standardized test scores and HSGPA as reliable predictors of college GPA and/or retention (Berry & Sackett, 2009; Sperry, 2015; Westrick et al., 2015). Westrick et al. (2015) analyzed first year college GPA as a factor of ACT composite scores, HSGPA, and student socioeconomic status. A Pearson’s product-moment correlation, accounting for the following predictor variables—SES, HSGPA, and ACT—was used. The measurement included how those predictor variables influenced first year college GPA as well as cumulative GPA. The estimated correlation between first year GPA and ACT was .51 and the estimated correlation between first year GPA and HSGPA was .58. In their study, ACT scores and HSGPA had a stronger predictor value than SES in first year grades (Westrick et al., 2015). The evidence proposed stands to reason. The HSGPA is a four-year record of academic performance while a standardized test score is one moment in time; however, including a test score with HSGPA can result in more accurate results (Zwick, 2017).

Berry and Sackett (2009) postulated that by using college GPA as the criterion the predictive validity of HSGPA and the SAT was actually underestimated. They proposed using individual course grades as the criterion of academic performance. The results were intriguing.
They found the validity of the SAT score was .457 and HSGPA was .485 (Berry & Sackett, 2009) in predicting freshman year GPA. When using academic performance in individual courses as the criterion the correlation with SAT scores was .548 and with HSGPA was .593 (Berry & Sackett, 2009). Their research indicated that HSGPA and SAT scores better predicted individual course grades as opposed to overall GPA freshman year. Bettinger et al. (2013) found even when controlling for race and gender ACT sub-scores of math and English were highly predictive of first-year college outcomes.

There have been critics of incorporating standardized exams in admission practices. Starting in 1969, Bowdoin adopted a test-optional admission policy; many colleges have followed suit and have endorsed test-optional procedures as one productive tool in admissions (Syverson et al., 2018). Most recently the University of California Board of Regents changed the standardized test requirement for all undergraduates until Fall 2024. Standardized test scores may be submitted but will not be used when making admission decisions. By Fall 2025, a new test, focusing on content students should have mastered for college readiness, will be created by the university system. If it is not created in that time, UC will eliminate standardized testing for students from California (Hubler, 2020). Another rationale for test-optional policies would be the “signaling” effect to students. The focus would be on student learning during their four years of high school as a preparation and indicator of readiness for college rather than a single point in time when taking a standardized entrance exam (Cortes, 2013).

In a quasi-experimental study using a difference-in-differences design, Belasco et al. (2015) indicated a counterargument to the stated goals of test-optional admission policies. They found that test-optional colleges enrolled a smaller portion of lower income students (based on Pell grants awarded) and underrepresented minorities than test-requiring colleges. They posited
that test-optional may purport to increase college access for low-income and underrepresented students; it in fact does not do so but does increase the perceived status of such institutions (Belasco et al., 2015).

**Advanced Placement Exams**

Similar to research conducted by Fischer (2007) this study will account for the number of AP classes taken by prospective students. Specific to this study the AP classes accounted for will be course related only.

**Student Stress**

While current research indicates a significant relationship between ACT scores and first year college grades (Westrick et al., 2015; Zwick & Sklar, 2005), it could be argued that other nonacademic variables are at play (Pascarella et al., 2004; Saunders-Scott et al., 2018; Sparkman et al., 2012). In addition to demographic characteristics and pre-college predictors, self-reported student stress was also examined. In a 2004 study on college students in the United Kingdom, Andrews and Wilding found that anxiety itself did not affect academic performance; however, their conclusions did confirm that stress from financial difficulties could affect academic performance (Andrews & Wilding, 2004). If a student experiences perceived stress, “defined as the extent to which an individual perceives that their demands exceed their ability to cope” (Adams et al., 2016, p. 362-363), they are more likely to have poor academic performance. Additionally, stress as a predictor of failure (college dropout) may be intensified for minority students in the first year of college (Amirkhan & Kofman, 2018). The concept of stress as a predictor was included in this study given the importance postulated in literature.
Study Site and Context

Brigham Young University is a research institution with a focus on undergraduate work exemplified by the undergraduate enrollment of 31,292 and 187 undergraduate majors (Enrollment Services, 2021). General education is a large component of an undergraduate’s experience and is comprised of four categories: Individual and Society (American Heritage), Skills, and Arts, Letters, and Sciences (Brigham Young University, 2021). Although specific study areas and programs are highly rated, BYU has remained committed to General Education. The significance of General Education has been a long-held tradition at BYU. Karl G. Maeser, viewed as the founder of the Brigham Young Academy (predecessor of BYU), facilitated a variety of courses such as, rhetoric, arithmetic, reading and geography, meant to encourage growth, communication, and leadership qualities in the students (Brigham Young Academy, n.d.; Maeser, n.d.; Talmage, n.d.). The course being examined in this study, American Heritage, is the only course at the university that was mandated by the Board of Trustees (see Appendix E). A recent article by Yoni Appelbaum (2016) in The Atlantic echoed this theme:

Students are clamoring for degrees that will help them secure jobs in a shifting economy, but to succeed in the long term, they’ll require an education that allows them to grow, adapt, and contribute as citizens - and to build successful careers. (para. 2)

Hanushek et al. (2017) emphasized the importance of providing opportunities for students to not just have vocational training but experiences that would develop stronger cognitive skills seen as necessary in current economies.

American Heritage is a General Education course taught by faculty from three different departments. The faculty rotate teaching and oversight responsibilities. Given the size of the course and wanting the students to have more personal engagement, the faculty support a hybrid
model with lectures given by faculty in large lecture halls (small lecture hall seats a maximum of 284 and the large lecture hall seats a maximum of 859) two days a week, and teaching assistants (TAs) responsible for lab-based instruction in classrooms of 30 students or fewer one day per week. The teaching faculty meet weekly during the semester with TAs to provide instruction and support for materials to be taught in the weekly labs. The teaching assistants are typically undergraduate students from a variety of academic disciplines that are hired after a rigorous process.

A number of years ago, a pattern began to emerge in class performance. It was noticed by astute TAs that specific groups of students did not seem to perform as well as expected in the course given the high average GPAs and ACT scores of entering freshman. The TAs did not have access to the demographic information (race, permanent address, mission status, parent educational level) for the students registered in their sections, but some TAs began to see patterns. The same discrepancies had also been noticed by faculty and by me as course coordinator. The evidence that some student groups were not performing at capacity was at this point purely circumstantial, but the stories of individual students prompted this study which explored questions with the intent of identifying at-risk students and ultimately of improving their course experience.

**Review Room**

Enrolled students have access to the Review Room. Subject recitations are delivered by experienced TAs the first 15 minutes of each hour. The remaining 45 minutes are spent in group discussions, essay help, and study. Attendance at the review room is optional but students are encouraged by the teaching faculty, course administration, and staff to attend review room hours as it is understood that students that seek out additional help for academics typically have better
performance than those students that may have needed the help but did not seek it out. In addition, some evidence indicates students gain an advantage from learning in groups (Fischer, 2007).

**Study Group Course**

POLI 319R was a pilot study group course created by American Heritage faculty in collaboration with peers in the Political Science and Economics departments. The course gave students an opportunity to participate in a peer-led one credit course designed to improve performance. In addition, this class was targeted as a topic of research into leadership, cooperative peer-led programs, and group composition. In a 1998 study conducted by Johnson et al. evidence was found that cooperative learning promoted higher individual achievement compared to competitive or individualistic efforts (effect size = .49 and effect size = .53 respectively; Johnson et al., 1998). In another exploratory study focused on nursing students, results established that those who participated in study groups had higher pass rates and lower failure rates (Jeffreys, 2001). Tien et al. (2002), working within the context of a rigorous undergraduate Organic Chemistry course, also found evidence to support peer-led team learning as an academic support. Using this approach, they found that students who engaged in the workshop had an overall positive shift in performance in the percentage of students earning A, B, and C grades when compared to students that did not participate in the workshop (Tien et al., 2002). Lewis (2011) found similar results. Again, using peer-led team learning (PLTL) in an undergraduate general chemistry course, there was a 15% improvement in the percentage of students (in PLTL) that passed the course. This was significant ($t=3.69$, Cohen’s $d = 1.56$, large effect size) (Lewis, 2011). In a 2016 article exploring peer tutoring programs, Colver and Fry found that offering individualized tutoring was not manageable. In this study, they found that
peer study groups, similar to the study group in POLI 319R, would be the preferred means for student academic support (Colver & Fry, 2016).

**Statement of Purpose**

This study examined a range of student demographic characteristics, specifically, first-generation status, pre-college performance indicators, course characteristics, and student stressors, to first better understand student performance in the course and secondly to potentially predict specific student groups that are under performing and, ultimately, facilitating success of such at-risk students. While the data collected will be specific to one large general education course, it is anticipated that the empirical information gathered through this study will help inform future practice in a variety of higher education teaching situations. In addition, valuable information may be gathered for college administrators and faculty in working with specific student groups and facilitating optimal performance. In line with the sentiments of Pike and Kuh (2005) a higher education institution is unable to change the demographic characteristics of its students (and indeed, many higher institutions today are actively expanding access for traditionally-underserved populations), “But it can implement interventions that increase the odds that first-generation (or other specific group) college students “get ready,” “get in,” and “get through” by changing the way those students view college and by altering what they do after they arrive” (p. 292; italics added)

Informed by the literature discussed above, this study will address the following research questions:

1. Is student performance in the American Heritage course predicted by student-level demographic variables?

2. Is FGS status significant in predicting student performance?
3. Are HSGPA, ACT score, or the number of AP classes taken in high school predictive of student performance?

4. What is the association between stress and student performance?

5. Does registration in an optional, peer-led, study group course have a significant effect on course performance?

**Understanding American Heritage**

**Frameworks**

Many theoretical frameworks were studied, and all had value in defining what variables to use in the study, however, given the exploratory nature of this study, the defining theoretical framework, social capital was used to help inform the study concerning what factors should be analyzed.

Other frameworks studied included stereotype threat, cultural capital, and wellness. Stereotype threat, or the threat of being viewed through the lens of a negative stereotype or performing in a way that would confirm a stereotype, was assessed in regard to minority status and figures involving race were included in the demographics (Amirkhan & Kofman, 2018; Liang et al., 2018; Perna & Thomas, 2006; Shapiro & Neuberg, 2007; Zwick & Sklar, 2005). The intent of this study was not to confirm or deny the theory of stereotype threat, rather, the intent was to explore various theoretical frameworks to discover the most important data to collect.

Based on the influence of cultural capital and the transmission from one generation to the next of cultural goods as well as long term dispositions of the mind, estimated household income was investigated (Bourdieu, 1986). BYU does not collect data on household incomes or parental earnings for incoming students. In order to access that information permanent addresses were
obtained from the campus Enrollment Services and using census tracts estimated household incomes were gathered. One limitation of this study was that collecting data on HHI for the international students was difficult and the variable was not included. Initially, for the international students included in this study HHI was estimated using the country of origin’s GDP in US dollars, information that was found on the World Bank Group website. That information was later determined to be inconsistent with the self-reported estimated HHI of a cohort of international students. Given the complexities of estimating HHI internationally and using that as a variable the decision was made to remove the International students in this study with the exception of the 26 Canadian students. Canadian students estimated HHI was included (with some reservations) due to the similarity in the census tracts used to estimate HHI for students from the United States and the division census reports generated by the Canadian government. The Canadian dollar amount was then converted to the standard US dollar amount. This information was obtained using geospatial services through BYU. Cultural capital also played a role in the investigation of parental educational level on the performance of students in American Heritage. In this regard, cultural capital was seen as transmission of skills that parents with four-year university degrees were able to supply their college bound students (Covarrubias et al., 2018; Dumais & Ward, 2010). Understanding the implicit rules and code of conduct associated with a college setting could be an advantage for non- FGS students (Lareau & Weininger, 2008).

One other theoretical framework that played a small role in this exploratory study was that of wellness, especially in regard to how stress can affect performance (Prilleltensky, 2012). This variable was included given the dramatic increase in the perceived stress experienced by college students in the last 30 years (Pritchard & Wilson, 2003), with first year students perhaps
being more vulnerable to the stress associated with college attendance (Robotham & Julian, 2006). Some recent research also indicates that stress is a strong correlate of college grades and minority students may be under additional burdens of stress (Amirkhan & Kofman, 2018). The American Heritage course is a rigorous first year course that has a reputation for being difficult and inciting high levels of stress in enrolled students.

The final and most significant framework used for this study was social capital. Requested data that was influenced by this framework included parental educational levels and permanent address (later to be used to find estimated household income), religion (including return missionary status), student-athlete status, international student status, and race for each student. Portes stated “social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures” (Portes, 1998, p. 6). It is worth noting that social capital can be considered a multiplier for other forms of capital currently held by an individual (Bourdieu, 1986). Social capital, in terms of relationships and networks, can often provide support to students that are crucial (Bourdieu, 2002). Certain suppositions were influential in data choice. The level of education a parent has would seem to provide some social networks for the student and could lead to more successful acculturation in a college environment by a non FGS (Pike & Kuh, 2005). In 2006, after analyzing literature regarding the completion rates of FGS in the United States, Ishitani concluded that being white and wealthy has a positive impact on academic and social integration (Ishitani, 2006). Understanding how race and estimated parental income could impact social integration or relationships and indirectly influence final percentage in the course was integral to this study (Liang et al., 2018).
Analysis

In effort to answer the research questions posed previously, the study uses five separate ordinary least squares multiple regression models to test the relationships between various student and course characteristics and student performance in the course. Model 1 focused on demographic characteristics – sex, race, religious affiliation, mission status, Canadian status, student athlete status, and estimated household income – of enrolled students for both Winter and Fall 2019 semesters. Model 2 adds the variable distinguishing first-generation college students. Model 3 adds the pre-college performance variables most commonly used to predict a student’s college performance: HSGPA, ACT score, and number of AP courses taken in high school.

Model 4 adds variables from the Student Stress Inventory (Gadzella, 1994) and two questions regarding mental and physical health. The final model (Model 5) adds to Model 3 the course related variables, with participation in the optional study course being the primary explanatory variable of interest.\(^5\) Statistical models are run for Winter and Fall 2019 semesters separately, as a robustness check on the significance of results. It should be noted that Pacific Islanders were omitted from the models in Winter 2019 due to insufficient sample size.

\(^5\) Model 5 does not include the stress and health-related variables from Model 4.
References


Brigham Young Academy, *Grand Record UA 213, V. 1-2, Folder 1, pp. 12-13, L. Tom Perry Special Collections, Harold B. Lee Library, Brigham Young University, Provo, UT.


Geiser, S., & Santelices, M. V. (2007). Validity of high-school grades in predicting student success beyond the freshman year: High-school record vs. standardized tests as indicators of four-year college outcomes. *Center for Studies of Higher Education* https://escholarship.org/uc/item/7306z0zf


Maeser, K., *The first with the II Term of Grammar Dept June 30, 1876* UA 229, Folder 1, pp. 3-4, L. Tom Perry Special Collections, Harold B. Lee Library, Brigham Young University, Provo, UT.


Talmage, J., *General Programme for First Term Third Year UA 608, Folder 1, L. Tom Perry Special Collections, Harold B. Lee Library, Brigham Young University, Provo, UT.*


APPENDIX B

Extended Methods

Sample and Data

This study was conducted over two semesters (Winter and Fall) in 2019 at BYU. Enrollment numbers were consistent with previous semesters, with 1,515 students enrolled in Winter 2019, and 2,281 students enrolled in Fall 2019. Student progress in the course was measured and evaluated at the end of each semester with a final percentage and letter grade.

Dependent Variable

Table 1 includes information from each semester on final score components. Variation in course assignments and their associated weights in the final grade calculations occurred as a result of different teaching faculty. Information about the final grade, for explanatory purposes only, and percentages in the aggregate can be found in Figures B1 and B2 for Winter 2019 and Figures B3 and B4 for Fall 2019. Independent variables will be described in each model as they are investigated.
Table B1

Components of Final Grades by Semester

<table>
<thead>
<tr>
<th></th>
<th>Winter 2019</th>
<th>Fall 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Points</td>
<td>Assignments</td>
</tr>
<tr>
<td>Partisan Paragraphs</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>Quizzes</td>
<td>100</td>
<td>Quizzes</td>
</tr>
<tr>
<td>Midterm #1</td>
<td>100</td>
<td>Essays</td>
</tr>
<tr>
<td>Short Paper #1</td>
<td>50</td>
<td>Participation Points</td>
</tr>
<tr>
<td>Midterm #2</td>
<td>250</td>
<td>Midterm #1</td>
</tr>
<tr>
<td>Short Paper #2</td>
<td>100</td>
<td>Midterm #2</td>
</tr>
<tr>
<td>Final Exam</td>
<td>350</td>
<td>Final Exam</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>Total</td>
</tr>
</tbody>
</table>

Figure B1

Density for Final Percentage, Winter 2019
Figure B2

*Frequency of Letter Grades, Winter 2019*

Figure B3

*Density for Final Percentage, Fall 2019*
Independent Variables (Explanatory Variables)

Five models were included in this study. Each model focused on specific variables chosen based on prior research. The study incorporated four categories of explanatory variables: demographic characteristics, pre-college predictors, student stress survey responses, and course-level characteristics including lab and lecture size and participation in an optional study group course.

Model 1

Model 1 focused on demographic characteristics. The majority of the demographic information was obtained from university resources. One exception was household income which was not available as it is not requested through the application process or at the time of enrollment. Permanent addresses were supplied through campus enrollment services. The TIGER/Line shapefiles were used as a resource to provide an estimated household income based
on a specific geographical region (U.S Census Bureau, 2019). As such, it doesn't provide the income for a student’s specific household, but rather an estimate based on the neighborhood where the student’s family resides. There were eight students in the sample with parent(s) employed by the United States military. For these students, household income was estimated based on an average of 20 years of military experience. It should be noted that finding an exact household income was not possible, so other sources were utilized. Given that the estimated income was based on the average of a household’s neighborhood or even larger area, there is some statistical noise inherent in this measure, which could affect results, specifically in terms of the significance of estimated household income on performance. Seventy international students (all international students with the exception of Canadian citizens) were not included in this study due to lack of accessible data. Accessing data on estimated household incomes for this group of students was not possible. Following Smeeding and Weinberg's (2001) Toward a Uniform Definition of Household Income, it was determined that making international comparisons of household incomes was not feasible.

Model 2

Model 2 included the independent variables from Model 1 with the addition of first-generation status. Historically, American Heritage has slightly more FGS students enrolled than the general student body. In the semesters the study was conducted, almost 13% of the total BYU student body identified as FGS. In American Heritage, the average was 14%. (Enrollment Services, 2021). These phenomena could indicate a systemic issue at a university level. FGS students may be unaware of ways to opt out of American Heritage; for example, through concurrent enrollment classes or the option to complete two courses from three different colleges.
Model 3

ACT score, high school GPA, and AP course information for Advanced Placement courses with content integral to the course were the new independent variables added in Model 3. Information on the use of ACT score and HSGPA has been provided. Additional information on AP courses is warranted. While there are 38 AP Exams available to American high school students, not every school or even district has the resources to offer a complete selection. Many secondary schools offer some AP classes (86%) while the average number of courses offered per high school is eight. The majority of the eight classes offered include calculus AB, English, and history (Klopfenstein & Thomas, 2009). When identified by subject, Klopfenstein and Thomas did find AP government (one course crucial to this study) a driving force in higher first semester GPAs (Klopfenstein & Thomas, 2009).

Model 4

The inclusion of survey responses to the Student Stress Inventory (Gadzella, 1994) was the adjustment in Model 4. Optional surveys were sent to enrolled students and included a variety of stressor indicators. Three examples out of the 23 asked are: “I have experienced failures in accomplishing the goals I set,” “I have experienced conflicts which were produced when a goal had both positive and negative alternatives,” and, “I worry a lot about everything and everybody.”

The SLSI was first presented as a paper at the Annual Meeting of the Texas Psychological Association in November 1991 (Gadzella et al., 1991). It is still in use almost three decades later. Li and Yang (2016) used the SLSI in a cross-cultural study on stress in college students. They found this instrument for stress predictive of trait resilience and self-efficacy using samples from three different countries. Li et al. (2018) examined resilience, self-
efficacy, and social support seeking as the mediators between stress and problem solving using Gadzella’s SLSI.

**Model 5**

Model 5 investigated the impact of course related variables on course performance. The first variable measured the participation by students in an optional, for-credit study group course. The American Heritage faculty and administration created a pilot optional study group course to begin Winter 2019, which could potentially be used as an intervention to facilitate student success. Students met once per week in groups of up to six to review material and tasks related to American Heritage. Weekly instructions were provided by faculty to this student-led study group course. Assignments ranged from writing and analyzing sample exam questions to short essays. Students were given a letter grade for this one-credit course. This did not replace the American Heritage course but was seen as a resource for interested students. Assignments for this optional course were created by experienced faculty in the College of Family, Home, and Social Sciences at BYU but the actual study group class was student-led and student-driven. There was some initial concern that selection bias may affect results; it was important to make sure that students who chose to register for the course were not significantly different from students that did not choose to register. Initial reservations were evident on the study group course enrollment: Were students that registered more motivated and therefore more likely to register for the course? Did registered students have better access to information regarding the course? Would students have time in their schedule to access the course? As such, testing was conducted for observable differences between the two groups. There were no significant differences between the two groups on the majority of the observed variables; however, there were a couple of exceptions. Some significance was seen between the students registered for the study group course and those
that did not in the balance tests. In the Winter 2019 semester 25.6% of enrolled women took the study group course whereas 17.6% of men took the course (Cramer’s $V = .09; p < .01$). In the Fall 2019 semester 21.3% of females registered for American Heritage also registered for POLI 319R whereas only 12.9% of enrolled males took the optional course (Cramer’s $V = .11; p < .01$). While there was no statistical significance in Winter 2019 in regard to race, the Fall 2019 semester did see some significance with 17.5% of enrolled non-white students enrolled in the study group course and 17.6% of enrolled white students enrolled in the study group course (Cramer’s $V = .001; p < .01$). Although the differences for gender and race were statistically significant, they were so small as to not be substantive (Cohen, 2013). We do not anticipate bias based on selection. Other course-related variables were lab and lecture size and review room attendance.
References


APPENDIX C

Consent Form

Fw: [External] Fwd: X18455 PI: Jessica Preece IRB Determination: APPROVAL

O’Connell, Stephan D.
Mon 10/2/2019 2:45 AM
To: O’Connell, Stephan D. <scoconnell@emory.edu>

-------- Forwarded message --------

From: Human Subjects Committee <hsc@byu.edu>
Date: Thu, Dec 20, 2018 at 9:24 AM
Subject: X18455 PI: Jessica Preece IRB Determination: APPROVAL
To: Jessica Preece <jessica_preece@byu.edu>

INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECTS

Memorandum

To: Professor Jessica Preece
Department: POLSCI
College: FHSS
From: Sandie Alina, MPA, IRB Administrator
Bob Ridge, PhD, IRB Chair
Date: December 20, 2018
IRB#: X18455
Title: “Formal Leadership Structure, Group Gender Composition, and Women’s Authority in Work Teams: A Field Experiment”

Brigham Young University’s IRB has approved the research study referenced in the subject heading as expedited level categories 5 and 6. The approval period is from December 20, 2018 to December 19, 2019. Please reference your assigned IRB identification number in any correspondence with the IRB. Continued approval is conditional upon your compliance with the following requirements:

1. A copy of the informed consent statement is attached. No other consent statement should be used. Each research subject must be provided with a copy or a way to access the consent statement.
2. Any modifications to the approved protocol must be submitted, reviewed, and approved by the IRB before modifications are incorporated in the study.
3. All recruiting tools must be submitted and approved by the IRB prior to use.
4. In addition, serious adverse events must be reported to the IRB immediately, with a written report by the PI within 24 hours of the PI’s becoming aware of the event. Serious adverse events are (1) death of a research participant; or (2) serious injury to a research participant.
5. All other non-serious unanticipated problems should be reported to the IRB within 2 weeks of the first awareness of the problem by the PI. Prompt reporting is important, as unanticipated problems often require some modification of study procedures, protocols, and/or informed consent processes. Such modifications require the review and approval of the IRB.
6. A few months before the expiration date, you will receive a continuing review form. There will be two reminders. Please complete the form in a timely manner to ensure that there is no
APPENDIX D

Instrument

AMERICAN HERITAGE

Evaluation Survey

American Heritage 100 Survey
The American Heritage course is working with several faculty members from other BYU departments on a research project that will assess different aspects of the American Heritage experience. This scholarly research study is being conducted by Jessica Preece, Ph.D., Olga Stoddard, Ph.D., Christopher Karpowitz, Ph.D., and Kristen Betts, American Heritage Coordinator, at Brigham Young University.

To complete this research, the investigators request that American Heritage 100 students take the following survey. Signing this consent form signifies your willingness to allow your data from the survey to be used in the scholarly research study. All data will be kept confidential.

Procedures
The survey will take most people about 10-15 minutes to complete. Your grade will not be dependent on what you say or answer on the survey, so please answer honestly. By consenting, you are also agreeing to allow researchers access to the following BYU administrative data: GPA, name, student ID, age, sex, most recent grade in American Heritage 100, previous American Heritage experience, ACT score or equivalent measure used for admission, high school GPA used for admission, number of total credits taken during this semester, return missionary status, ethnicity, Pell Grant status/FAFSA, permanent address, high school/high school State, AP exam scores, intended or declared major, international student status, first generation college student status, AH100 lab attendance, and AH100 review room attendance. This will allow us to see which students benefit the most from study groups.

If you allow your data to be used in the scholarly research part of the study, your name will never be published. Only aggregate, unidentifiable data will be published.

Risks/Discomforts
There are minimal risks to you in this research study beyond what you would encounter in your everyday life. The surveys ask standardized, commonly asked questions. However, it is possible you could encounter some emotional discomfort as you answer these questions. If answering any specific question causes you emotional discomfort, you may skip it.

Benefits
There will be no direct benefits to you. It is hoped, however, that through your participation researchers may improve future American Heritage course practices and make important contributions to the scholarly literature on this topic.

IRB NUMBER: IRB2019-429
IRB APPROVAL DATE:
Confidentiality
The research data, including surveys and Enrollment Services data, will be kept in a secure location and on password protected computer. Only the researchers will have access to data that identifies you. Identifying data will be kept indefinitely to allow researchers time to analyze a variety of aspects of it, but it will not be shared. Data that has removed your identifying information may be shared with other researchers, in keeping with scientific norms in the social sciences.

Compensation
No compensation will be given for completion of the survey.

Participation
Participation in this research study is voluntary. Refusal to participate in the research study will not jeopardize your class status, program placement, grade, or standing with the university.
If you choose to make your data available for the research study, your responses will always be kept completely confidential, and your name will never be attached to your responses or the study results in any way.

Questions about the Research
If you have questions regarding this study, you may contact Olga Stoddard, Ph.D. (olga.stoddard@byu.edu), Jessica Preece, Ph.D. (jessica_preece@byu.edu), Christopher Karpowitz, Ph.D. (chris_karpowitz@byu.edu), and/or Kristen Betts (kristen_betts@byu.edu) for further information.

Questions about Your Rights as Research Participants
If you have questions regarding your rights as a research participant contact IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

Statement of Consent:

☐ I have read and understood the above information and consent to participate in this study.

☐ I do not wish to participate in the scholarly study and request that any data collected on me be
American Heritage 100 Study

The American Heritage course is working with several faculty members from other BYU departments on a research project that will be used for two purposes: 1) an internal program evaluation to assess different aspects of the American Heritage experience and 2) a scholarly research study to understand the dynamics of group work and group decision-making and the effect of study groups on performance in American Heritage. This scholarly research study is being conducted by Jessica Preece, Ph.D., Olga Stoddard, Ph.D., Christopher Karpowitz, Ph.D., and Kristen Betts, American Heritage Coordinator, at Brigham Young University.

The course requires participation in the tasks below for the internal evaluation as part of your class credit. However, allowing the data we gather from your participation to be used as part of the research study is completely voluntary and will not affect your grade or standing in the course in any way. Signing this consent form signifies your willingness to allow your data to be used in the scholarly research study. All data will be kept confidential.

Procedures

The initial survey will take most people about 10-15 minutes to complete. During the semester, the following will occur:

You will receive a link to carry out an online survey through Qualtrics about once a month during the semester. These surveys take most people about 5-7 minutes to complete.

Questions will address your perspectives about the program and your group dynamics. Because we want honest feedback, the content of your answers will not affect your grade or standing in the program in any way. Total time commitment for all of the surveys will be approximately 50 minutes.

If you are assigned to a group, you will be audio recorded during study sessions so that we can understand the process of decision-making across individuals and in groups. We may also request that you use a standard communication tool (a Slack channel) for out-of-class communication with your group members. If so, we will have access to this communication. This data will be kept confidential and only reported in aggregate, unidentifiable ways. In other words, we are looking for broad patterns and your name will never be reported with anything you say or answer on a survey. Your grade will not be dependent on what you say or answer on a survey.
By consenting, you are also agreeing to allow researchers access to the following BYU administrative data: GPA, name, student ID, age, sex, most recent grade in American Heritage 100, previous American Heritage experience, ACT score or equivalent measure used for admission, high school GPA used for admission, number of total credits taken during this semester, return missionary status, ethnicity, Pell Grant status/FAFSA, permanent address, high school/high school State, AP exam scores, intended or declared major, international student status, first generation college student status, AH100 lab attendance, and AH100 review room attendance. This will allow us to see which students benefit the most from study groups.

If you allow your data to be used in the scholarly research part of the study, your name will never be published. Only aggregate, unidentifiable data will be published.

**Risks/Discomforts**

There are minimal risks to you in this research study beyond what you would encounter in your everyday participation in the American Heritage course or typical group work interactions. The surveys you will take will ask standardized, commonly asked questions. However, it is possible you could encounter some potential emotional discomfort as you answer these questions. If answering any specific question causes you emotional discomfort, you may skip it. If you experience unusual distress in your study group, please contact the investigators with your concerns. If the situation cannot be resolved in a way that satisfies both parties, we will find an alternative arrangement.
Benefits

There will be no direct benefits to you. It is hoped, however, that through your participation researchers may learn about group dynamics and decision-making and that this study will inform future American Heritage course practices and become an important contribution to the scholarly literature on this topic.

Confidentiality

All research data, including surveys, audio recordings, and administrative data, will be kept in a secure location and on a password protected server and computers. Only the researchers will have access to data that identifies you. Identifying data will be kept indefinitely to allow researchers time to analyze a variety of aspects of it, but it will not be shared. Data that has removed your identifying information may be shared with other researchers, in keeping with scientific norms in the social sciences.

Compensation

No compensation will be given for completion of the surveys.

Participation

While participation in these tasks is required as part of the internal program evaluation, you do not have to grant access to the data collected during these activities for external scholarly research purposes. You have the right to refuse participation at any time in the external scholarly research study; if you do not consent, your data will not be used in scholarly data analysis nor will it be used in any scholarly publications. Refusal to participate in the scholarly study will not jeopardize your class status, program placement, grade, or standing with the university.

If you choose to make your data available for the scholarly study, your responses will always be kept completely confidential, and your name will never be attached to your responses or the study results in any way.
Questions about the Research

If you have questions regarding this study, you may contact Olga Stoddard, Ph.D. (olga.stoddard@byu.edu), Jessica Preece, Ph.D. (jessica_preece@byu.edu), Christopher Karpowitz, Ph.D. (chris_karpowitz@byu.edu), and/or Kristen Betts (kristen_betts@byu.edu) for further information.

Questions about Your Rights as Research Participants

If you have questions regarding your rights as a research participant contact IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

Q2 Statement of Consent (Completion of surveys and recorded group work is still required for class credit, but data collected from your participation will not be used in scholarly research if you do not consent.)

☐ I have read and understood the above information and consent to participate in this study.

☐ I do not wish to participate in the scholarly study and request that any data collected on me be excluded from any published academic articles. I understand that I still must complete the surveys and recorded group work for class credit as part of the internal program evaluation.
Dear American Heritage Student,

Welcome to Brigham Young University and to American Heritage! We congratulate you on the outstanding achievements that have brought you to our campus. You are receiving this email because you are currently registered for a section of American Heritage this fall.

We are writing to let you know that we are looking forward to meeting you in two months and to let you know about a unique resource that is being offered this year. Because we are interested in learning more about the resources that help students succeed, several faculty have created an optional study group class focused on American Heritage. This class, POLI 319R (Sections 2-15), is a 1 credit course that is also part of an academic study being conducted by Professor Karpowitz and several colleagues here at BYU. They have developed this resource in part to provide information to American Heritage faculty on the effectiveness of study groups in helping you learn.

While we can’t guarantee the study group class will improve your grade, it will be an opportunity for you to meet with peers to discuss American Heritage topics and develop new learning skills. You can discover more information about the course by clicking on this link: http://americanheritage.byu.edu/Home/Pages/StudyGroupCourseFAQ. The course is completely voluntary, but if you can fit it into your schedule, we highly recommend it.

We will be in touch later in the summer with some additional details and information about American Heritage, but we wanted you to know about the study groups course while you’re making decisions about course registration. In the meantime, we wish you a happy and productive summer, and we look forward to seeing you in September!

Best,
Professors Chris Karpowitz and Kelly D. Patterson

Do you have an ongoing or serious health condition that requires frequent medical care or considerations --for example, regular doctor visits, daily medications, or the use of a medical or mobility device? Check all that apply.

IRB NUMBER: IRB2019-429
IRB APPROVAL DATE:
☐ Mental Health (1)
☐ Physical Health (2)
☐ Other (please specify) (3)
☐ Neither (4)
Please indicate the extent to which you relate to the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Never (1)</th>
<th>Seldom (2)</th>
<th>Occasionally (3)</th>
<th>Often (4)</th>
<th>Most of the time (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have experienced frustration due to delays in reaching my goals. (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have experienced daily hassles which affected me in reaching my goals. (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have experienced lack of sources (money for auto, books, etc.). (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have experienced failures in accomplishing the goals that I set. (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have not been accepted socially (become a social outcast). (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have experienced dating frustrations. (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel I was denied opportunities in spite of my qualifications. (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please indicate the extent to which you relate to the following statements:
I have experienced conflicts which were:
| Produced by two or more desirable alternatives.  
| (1) Produced by two or more undesirable alternatives.  
| (2) Produced when a goal had both positive and negative alternatives.  
<table>
<thead>
<tr>
<th>(3)</th>
<th>Never (1)</th>
<th>Seldom (2)</th>
<th>Occasionally (3)</th>
<th>Often (4)</th>
<th>Most of the time (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>〇</td>
</tr>
</tbody>
</table>
Please indicate the extent to which you relate to the following statements:
I experienced pressures:

<table>
<thead>
<tr>
<th></th>
<th>Never (1)</th>
<th>Seldom (2)</th>
<th>Occasionally (3)</th>
<th>Often (4)</th>
<th>Most of the time (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a result of competition (on grades work, relationships with spouse and/or friends). (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Due to deadlines (papers due, payments to be made, etc.) (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Due to an overload (attempting too many things at one time). (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Due to interpersonal relationships (family and/or friends, expectations, work responsibilities) (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please indicate the extent to which you relate to the following statements:
I have experienced:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never (1)</th>
<th>Seldom (2)</th>
<th>Occasionally (3)</th>
<th>Often (4)</th>
<th>Most of the time (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid unpleasant changes. (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too many changes occurring at the same time. (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change which disrupted my life and/or goals. (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please indicate the extent to which you relate to the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never (1)</th>
<th>Seldom (2)</th>
<th>Occasionally (3)</th>
<th>Often (4)</th>
<th>Most of the time (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to compete and win. (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to be noticed and loved by all. (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry a lot about everything and everybody. (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a tendency to procrastinate (put off things that have to be done). (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel I must find a perfect solution to problems I undertake. (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry and get anxious about taking tests. (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E

American Heritage

October 26, 1977

Dean Martin B. Hickman
College of Social Sciences
Brigham Young University

Re: American Heritage Course

Dear Dean Hickman:

At our BYU Board of Trustees meeting on October 13, 1977, President Dallin H. Oaks gave the Board a report on the revisions you and your colleagues have made in the American Heritage course material, a course which the Board has required of all BYU graduates. We were very pleased with your determination to give our students a superior course in the American heritage, including an account of the principles upon which our divinely inspired Constitution is based and the essentials of history, government and economics that need to be understood by all Latter-day Saints, and, indeed, by all Americans.

We are particularly pleased with the effort to incorporate in this course the insights of the restored gospel and the teachings of the living prophets, thus helping to inspire and inform our students with this union of sacred and secular truth we so earnestly seek at the University. While we realize that experience will allow further improvements in this course, we commend you and your colleagues for a fine effort well begun. Please share this commendation with those who have had part in this vital endeavor.

Sincerely,

[Signature]

President

[Signature]

First Vice-President

[Signature]

Second Vice-President

cc: Commissioner Jeffrey R. Holland
President Dallin H. Oaks

50 EAST NORTH TEMPLE, SALT LAKE CITY, UTAH 84116