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The Relationship Between Multifaceted Motivational Factors and Academic Achievement

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2020

Abstract

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Sandra LuAnn Beasley

MA, Walden University, 2010

BS, ASU: Barrett's Honor College, 2003

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

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Abstract

The United States has yet to reach the White House's 2020 goal of attaining the top international ranking in college degree attainment among young adults. Researchers have investigated the academic performance variables associated with timely degree attainment for first-year college students. Prior research has indicated that poorly motivated students are likely to struggle academically, experience academic stress, and drop out of school. However, it remains unknown which types of motivation significantly affect academic achievement. The purpose of this study was to better understand which Reiss basic desires of motivation predict undergraduate academic achievement. An additional purpose of this study was to determine which basic desires of motivation, among gender and age groups, predict cumulative grade point average (GPA). Based on Reiss's theory, I used the Reiss School Motivation Profile (RSMP) to examine which of the motivational factors predicted cumulative undergraduate GPA. Using a convenience sampling method, I recruited 459 community college students to complete the online surveys. The bivariate ordinal logistic regression results indicated a modest yet significant relationship between 4 of the Reiss motivation factors (curiosity, order, status, and vengeance) and cumulative GPA. The multivariate ordinal logistic regression results indicated a modest yet significant relationship between 3 Reiss motivation factors (order, vengeance, and physical exercise) and cumulative GPA, but not between gender, age, and cumulative GPA. The results of this study may provide useful insights to academic institutions administrators regarding how they can use motivational factors to identify students who may need academic assistance.

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Dedication

I dedicate this dissertation to the late Dr. Steven Reiss, an eminent clinical psychologist at Ohio State University and renowned researcher in the field of motivation and education (McNally, 2017).

Acknowledgments

First, I am thankful to the late Dr. Steven Reiss and his wife, Dr. Maggi Reiss, for allowing me to participate in the Reiss Motivation Profile (RMP) training course, corresponding with me via email, and providing the necessary information and resources to conduct this study.

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Chapter 1: Foundation of the Study and Literature Review

Introduction

In the field of educational psychology, researchers have found that motivation strongly affects student academic achievement up to college degree completion (Slanger, Berg, Fisk, & Hanson, 2015). *Academic achievement* refers to types of student grade point average (GPA), namely cumulative GPA across 8 semesters (Slanger et al., 2015); first-year GPA (Allen & Robbins, 2010); and first-year, first-semester GPA (Slanger et al., 2015). Motivational factors found to affect academic achievement or membership in academic achievement groups fall under three domains: (a) expectancies, (b) sources of motivation, and (c) goal types. *Expectancies* include self-efficacy, or how students perceive their academic performance (Krumrei-Mancuso, Newton, Kim, & Wilcox, 2013; Richardson, Abraham, & Bond, 2012). *Kinds of motivation* can include intrinsic, extrinsic, and amotivation (i.e., lack of motivation; Stover, Hoffmann, de la Iglesia, & Liporace, 2014). *Goal types* refer to students' grade goals (Richardson et al., 2012). Based on previous research on academic achievement and motivation, the present study addressed the educational issues of poorly motivated students who struggle academically, experience academic stress, and are likely to drop out of school.

The introduction sections of Chapter 1 include a summary of the recent research literature on college students' academic achievement and student motivation. I provide evidence of the decline of the United States' international ranking in tertiary-type B (or undergraduate) level of postsecondary degrees among young adults. Tertiary-type B level

of international education is equivalent to at least a 2-year associate degree with an emphasis on practical, technical, or occupational skills for direct entry into the workforce (OECD, 2016). I also describe a relevant, meaningful research gap related to the influence of motivational beliefs on both high and low academic achievements. In summary, in the introductory sections of this chapter, I review past research on the academic achievement and student motivation factors that significantly affect students' goals of attaining an undergraduate college degree.

Background

As well-known documented concepts in research literature, the conceptual variables in the motivational domain (i.e., sources of motivation, expectancies, and goal types) provide insight into probable reasons for the decline of the United States' international ranking in undergraduate level of postsecondary degrees. Under the domain *sources of motivation*, researchers have found that types of motivation—intrinsic, extrinsic, and amotivation—significantly predict academic performance (Stover et al., 2014). Under the domains *expectancies* and the *classification of goal types*, researchers have found that the motivational variables of academic self-efficacy, performance self-efficacy, and goal setting significantly predict student GPA scores (i.e., semester, course, cumulative, tertiary) among undergraduate students across class standings (Krumrei-Mancuso et al., 2013; Richardson et al., 2012). However, an area that appears to be under-researched concerns the motivational factors that predict both low and high collegiate academic performance (Campbell & Fuqua, 2008; Gershenfeld, Hood, & Zhan,

2015; Singh, 2014) within a theoretical framework that is goal-oriented and personality-trait specific (Froiland, Mayor, & Herlevi, 2015; Richardson et al., 2012). Theoretical personality traits include the following Big Five traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (Richardson et al., 2012). Further work in the under-researched area related to the influence of motivation on collegiate academic performance may provide important insights into why the United States' international ranking in postsecondary college degrees has fallen.

Reiss's (2004, 2013) 16 basic desires theory is a theoretical framework that is both goal-oriented and personality-trait specific. It is goal-oriented because the 16 basic desires pertain to end-goal variables or goals desired "for their own sake" (Reiss, 2004, p. 179). The 16 basic desires are acceptance, curiosity, eating, family, honor, idealism, independence, order, physical activity, power, romance, saving, social contact, status, tranquility, and vengeance (Reiss, 2004). It is personality-trait specific because the 16 basic desires are significantly correlated with the Big Five Traits: openness, conscientiousness, extroversion, agreeableness, and neuroticism (Olson, & Chapin, 2007). Because there appears to be a gap in the understanding of the multifaceted motivational factors (within a goal-oriented personality theory) that relate to academic achievement, I examined which motivational factors predict different levels of academic performance (i.e., cumulative GPA) among community college students. Additional learner characteristics of interest included both gender and age.

Problem Statement

The problem I addressed in this study was the United States' gradual decline from a top-10 ranking in international college completion among young adults (Obama, 2009; White House, 2016). To address the problem, the White House made it a national priority for the United States to reach the top international ranking in college completion by the year 2020 (Obama, 2009). The problem that led to this study is that the United States still has a way to go in meeting the White House's higher educational goal. Presently, the U.S. is in 10th place internationally in the attainment of a tertiary college degree among young adults (25–34), ranking behind such economic-shaping countries as Canada, Japan, Russia, and the United Kingdom (OECD, 2019). In their concern over college degree completion, researchers began investigating traditional and nontraditional academic performance variables that may relate to timely degree attainment and nondegree attainment for first-year college students (Allen & Robbins, 2010; Slanger et al., 2015). What has yet to be investigated is whether motivation (a nontraditional factor) significantly affects student GPA scores (the traditional factor of academic achievement) among community college students (Campbell & Fuqua, 2008; Gershenfeld et al., 2015). Examination of how motivation affects student performance (starting as early as students' first semester in their first year of college) may reveal why the United States' rate of international college completion among young adults has decreased.

Purpose Statement

The philosophical worldview on which I based the quantitative research design and conclusions of my study was post-positivism. This type of worldview refers to an independent, theory-driven reality in which all observations of reality are approximate, never fully explained, and never absolute (Gray, 2014; Scotland, 2012). With the post-positivism perspective in mind, the initial purpose of the study was to gain a better understanding of whether motivational factors, gender, and age predicted membership in either an academic probation group or an honors group. An additional purpose of the study was to examine whether there were any differences in the motivational factors associated with these two academic groups.

Due to the low number of participants in the first semester in which I conducted the study, I revised the purpose of the study and the research questions. The revised purpose of the study was to understand which motivational factors predict academic achievement (i.e., cumulative GPA) among community college students. An additional purpose was to determine which motivational factors, among gender and age groups, predict undergraduate academic achievement. Overall, in my quantitative study, I examined the association of cumulative GPA with 13 motivational factors, gender, and age among community college students.

Research Questions and Hypotheses

I examined the revised purpose of the study with 15 research questions regarding the association of Reiss basic desires of motivation with different levels of GPA, gender, and age.

RQ 1: Does the RSMP factor of social contact predict different levels of GPA?

H_o1:   The RSMP factor of social contact does not predict different levels of GPA.

H_a2:   The RSMP factor of social contact will predict different levels of GPA.

RQ 2: Does the RSMP factor of curiosity predict different levels of GPA?

H_o1:   The RSMP factor of curiosity does not predict different levels of GPA.

H_a2:   The RSMP factor of curiosity will predict different levels of GPA.

RQ 3: Does the RSMP factor of honor predict different levels of GPA?

H_o1:   The RSMP factor of honor does not predict different levels of GPA.

H_a2:   The RSMP factor of honor will predict different levels of GPA.

RQ 4: Does the RSMP factor of family predict different levels of GPA?

H_o1:   The RSMP factor of family does not predict different levels of GPA.

H_a2:   The RSMP factor of family will predict different levels of GPA.

RQ 5: Does the RSMP factor of independence predict different levels of GPA?

H_o1:   The RSMP factor of independence does not predict different levels of GPA.

H_a2:   The RSMP factor of independence will predict different levels of GPA.

RQ 6: Does the RSMP factor of power predict different levels of GPA?

H_o1:   The RSMP factor of power does not predict different levels of GPA.

H_a2:   The RSMP factor of power will predict different levels of GPA.

RQ 7: Does the RSMP factor of order predict different levels of GPA?

H_o1:   The RSMP factor of order does not predict different levels of GPA.

H_a2:   The RSMP factor of order will predict different levels of GPA.

RQ 8: Does the RSMP factor of idealism predict different levels of GPA?

H_o1:   The RSMP factor of idealism does not predict different levels of GPA.

H_a2:   The RSMP factor of idealism will predict different levels of GPA.

RQ 9: Does the RSMP factor of status predict different levels of GPA?

H_o1:   The RSMP factor of status does not predict different levels of GPA.

H_a2:   The RSMP factor of status will predict different levels of GPA.

RQ 10: Does the RSMP factor of vengeance predict different levels of GPA?

H_o1:   The RSMP factor of vengeance does not predict different levels of GPA.

H_a2:   The RSMP factor of vengeance will predict different levels of GPA.

RQ 11: Does the RSMP factor of physical exercise predict different levels of GPA?

H_o1:   The RSMP factor of physical exercise does not predict different levels of

GPA.

H_a2:   The RSMP factor of physical exercise will predict different levels of GPA.

RQ 12: Does the RSMP factor of acceptance predict different levels of GPA?

H_o1:   The RSMP factor of acceptance does not predict different levels of GPA.

H_o2:   The RSMP factor of acceptance will predict different levels of GPA.

RQ 13: Does the RSMP factor of tranquility predict different levels of GPA?

H_o1:   The RSMP factor of tranquility does not predict different levels of GPA.

H_a2:   The RSMP factor of tranquility will predict different levels of GPA.

RQ 14: Do the RSMP factors and gender predict different levels of GPA?

H_o1:   The RSMP factors and gender does not predict different levels of GPA.

H_a2:   The RSMP factors and gender will predict different levels of GPA.

RQ 15: Do the RSMP factors and age predict different levels of GPA?

H_o1:   The RSMP factors and age does not predict different levels of GPA.

H_a2:   The RSMP factors and age will predict different levels of GPA.

To test the first 13 null hypotheses, I performed bivariate ordinal logistic regression, an inferential statistical technique, in SPSS. To test the 14th and 15th null hypotheses, I preformed multivariate ordinal logistic regression analyses.

Theoretical Framework for the Study

Two related psychological theories guided my investigation of the impact of motivation on academic achievement at the community college level of education. Reiss (2004, 2013) empirically derived the first theory, the 16 basic desires of motivation, from both explorative and confirmatory factor analytical studies of what a diverse sample of

individuals perceived as motivating them. Reiss (2004, 2013) proposed that the theoretical constructs (i.e., basic desires of motivation) were innate, universal, and deeply embedded in human nature and that they resulted in goal-orientated behaviors. Moreover, the majority of the basic desires of motivation were positively associated with student academic achievement (Reiss, 2009, 2013). The second theory includes six of the motivational constructs noted in the 16 basic desires theory. Specifically, in the *six motivational reasons for low academic achievement* theory, Reiss (2009) proposed that poor scholastic performance was a result of students experiencing six high or low basic desires of motivation. Reiss (2009) derived the theory from both factor analysis and validity studies for each of the Reiss Motivation Profile (RMP) scales (Reiss, 2009). I discuss these theories in more detail in Chapter 2.

Taking into account Reiss's two interrelated theories on motivation, researchers have further investigated which basic desires of motivation were significantly associated with low or high academic achievement among students in secondary education (Froiland et al et al., 2015; Kavanaugh & Reiss, 2003). Based on current research, there appears to be no quantitative study that has examined which Reiss basic desires of motivation predict academic achievement among undergraduate students (Cerasoli, Nicklin, & Ford, 2014). Therefore, I used both of Reiss's motivational theories to guide my study examining which motivational factors predict different levels of academic performance (i.e., cumulative GPA) among community college students.

Nature of the Study

In the quantitative study, I used a cross-sectional survey design. In particular, I collected student data using the Reiss School Motivation Profile (RSMP) to assess which basic desires of motivation were significantly associated with academic performance (i.e., cumulative GPA) among community college students. The RSMP is a 104-item self-report questionnaire that measures 13 basic desires of motivation and represents motivational constructs of the 16 basic desires of motivation theory (IDS Publishing Corporation, 2017; Reiss, 2013). I used a cross-sectional survey to collect data to make inferences about community college students at one point in time (Sedgwick, 2014; Tourangeau, 2015). Collected data included sociodemographic information related to class standing, gender, age, race, ethnicity, and intellectual disabilities or mental health impairments (Beaudoin & Kumar, 2012; Fernandez et al., 2016).

To analyze the research data, I used the International Business Machines (IBM, 2019) SPSS statistical software (standard version 25.0) for Windows. I performed bivariate ordinal logistic regression in SPSS to examine whether RSMP factors, age, and gender predict different levels of cumulative GPA, broken into five ordinal groups: (a) less than 2.25, (b) 2.25–2.74, (c) 2.75–3.24, (d) 3.25–3.74, and (e) 3.75–4.00. I also performed multivariate ordinal logistic regressions with proportional odds in SPSS to determine the effect of (a) gender and the RSMP scales on cumulative GPA and (b) age and the RSMP scales on cumulative GPA. The results of this study may provide important insights for academic administrators regarding whether they can use

motivational factors to identify students who may need academic assistance or more challenging work.

Definitions

Basic desires of motivation. Human strivings or desires (Havercamp & Reiss, 2003).

College student. Undergraduate students, of various ages, at a western U.S. community college.

Cumulative GPA. Percentage of grade distribution per semester.

Tertiary education. International education programs equivalent to at least a two-year associate degree with an emphasis on practical, technical, or occupational skills for direct entry into the workforce (OECD, 2016).

Assumptions

There are four assumptions associated with my quantitative research study. First, I assumed that the psychometric instrument I used to measure the motivational reasons for students' GPA scores reliably measured the constructs. Second, I assumed that student respondents were honest about (a) their eligibility to participate in the study, (b) having sufficient language skills to understand the survey questions, and (c) not having any learning or intellectual disabilities that may affect the accuracy of the survey answers. Third, for the purpose of increasing both the accuracy of analysis and the reliability of study results, I assumed that the student participants candidly answered the survey questions. Last, I assumed that I recruited a sample of the targeted population of students

(in accord with current institutional statistics), increasing the generalizability of the research results to the targeted population.

Scope and Deliminations

There are two specific aspects of the research problem that I addressed in the study. I examined which multifaceted motivational factors predicted cumulative GPA among students enrolled at a community college. From a micro perspective, I focused on this because there appears to be increasing interest among researchers to help undergraduate students learn to manage the motivational drives that decrease the liklihood of obtaining a college degree (Allen & Robbins, 2010; Mengel, 2014). From a macro perspective, I chose this focus because college completion is a national educational issue. Recent statistics have indicated a substantial decline in the United States' international ranking for students' completion of at least an associate degree since 1990 (Fry, 2017; Nettles, 2017; OECD, 2016). Overall, the study addressed the issue of internal validity between the specific aspects of the research problem (i.e., U.S. decline in international college completion) and the rationale for the specific focus (i.e., to help students manage motivational drives that decrease the liklihood of obtaining a college degree).

I applied restrictive boundaries to the targeted population, the conceptual framework of the study, and the potential generalizability of the findings. The targeted population included community college students who were 18 years old or older and were primarily registered in first-year courses. As to the conceptual framework

of the study, I excluded Ryan's self-determination theory of motivation, even though it

relates to academic achievement because Ryan's theory does not address genetic-based

factors of internal motivation, unlike Reiss's (2004, 2013) 16 basic desires theory (Ryan

& Deci, 2000; Taylor et al., 2014). Types of genetic-based factors of internal motivation

included in Reiss's theory are curiosity, fear, and power (Froiland et al., 2015; Reiss,

2012). As to the remaining restrictive boundary of the study (generalizability of the

findings), the study results do not generalize to all ages of undergraduate students

because I targeted the individual attributes specifically related to the adolescent and

young adult stages of psychosocial development (Erikson, 1968; Goguen, Hiester, &

Nordstrom, 2010; Matsushima & Ozaki, 2015). In other words, the survey responses and

study results primarily reflected the attributes, beliefs, and perceptions of young adults

registered in introductory academic courses. Together, these specific boundaries of the

study were necessary to assure the external validity of the study findings.

Limitations

Potential limitations to the study design, methodological weaknesses, and biases

that may influence study outcomes were the nature of self-report measures, confounding

variables, and statistical outliers. As to the study design, the procedures related to

answering questionnaire items may have threatened the internal validity of the study.

Such threats include respondents' (a) misinterpretation of a questionnaire item

(comprehension stage), (b) lack of insight into their internal state of motivation (recall

stage), and (c) insensitivity to subtle changes in prior and present beliefs or behaviors

(integrate stage; Duckworth & Yeager, 2015). Potential threats to validity in the remaining procedural stages included reference bias and acquiescence bias. The former bias refers to respondents' frame of reference or implicit standard of selection of a Likert survey score (translate stage; Duckworth & Yeager, 2015). The latter bias (acquiescence bias) refers to respondents' inclination to agree with survey items regardless of actual content (response stage; Duckworth & Yeager, 2015).

To assure more accurate and unbiased self-reporting, I used best data screening practices. These practices included providing information about the RSMP survey; explaining the Likert 7-point scale response scores; discussing how to answer inapplicable questions; and encouraging the respondents to self-report a lack of energy, attention, or thoughtfulness following the completion of the survey (DeSimone, Harms, & DeSimone , 2015). Overall, by following these best data screening practices, I took reasonable measures to address the study limitations related to research design and associated biases.

As to the potential limitations in methodology weaknesses, I did not design the study to control for confounding variables (beyond gender and age), nor did I use extreme outlier values that could have influenced the research outcomes. I chose to include gender and age as variables because prior research has indicated that both of these variables predict GPA measures of academic achievement (Sangkapan & Laeheem, 2014; Tilahun, Gedefaw, & Asefa, 2015). Types of confounding variables that I did not use included those that are both traditional (i.e., race, ethnicity, religion) and

nontraditional variables (i.e., employment status, current living situation). A methodological weakness that may reflect error in the statistical analysis of student data is the use of extreme outliers (Yens, Brannan, & Dumsha, 2014).

In consideration of these specific research design and methodology limitations, I assured the internal validity of the research outcome by using ordinal regression analysis to control for the two covariates (gender and age) while examining which basic desires of motivation predict academic achievment (Pannucci & Wilkins, 2010). I also took measures to eliminate any extreme outliers by visually inspecting the data for any errors and statistically screening (i.e., graphing) for any extreme responses in the data (DeSimone et al., 2015). Inclusively, by utilizing both of the measures, I took reasonable actions to address the two methdlogical weaknesses of the study.

<div align="center">**Significance**</div>

The results of this study may inform low-achieving community college students on how best to manage particular behaviors and personality traits so that they can either avoid too much satisfaction of weak motivational drives or seek more satisfaction of strong life motivational drives, which put them at risk for completing an associate's degree (Allen, & Robbins, 2010; Mengel, 2014; Robbins, Oh, Le, & Button, 2009). For example, underachieving students with lower than average motivational drive for order could learn how to best to manage disorganized and careless behaviors and spontaneous personality tendencies (Mengel, 2014; Reiss, 2013). Also, underachieving students with a higher than average motivational drive for competition could learn how best to manage

defensive combative behaviors (Mengel, 2014; Reiss, 2013). Insights from this study may also aid students and instructors in targeting effective strategies for improving the success of probationary students whose motivational profiles negatively affect their GPA scores (Reiss, 2013). Overall, the study results may help academic administrators to identify which first-year community college students need extra assistance or more challenging endeavors by using their motivation profiles as indicators of either low or high academic achievement.

Chapter Summary

In review of Chapter 1, I introduced the Reiss motivation factors and how they relate to the academic performance of undergraduate students. Additionally, I summarized the major sections of Chapters 2 and 3 concerning (a) current research literature on academic achievement and student motivation, (b) the research questions and associated hypotheses, and (c) the research design and methodology. Furthermore, I briefly reviewed the purpose, nature, significance, scope, delimitations, and limitations of the study. In the next chapter, I provide an in-depth review of the empirical research on academic achievement and student motivation.

Chapter 2: Literature Review

Introduction

As the United States competes for top international ranking of college graduates by the year 2020, young adults' achievement of successful academic outcomes in postsecondary education is a national priority (Obama, 2009). This higher educational goal is a national priority because one of the more valuable skills in a global economy is the ability to sell knowledge with the prerequisite of a good education (American Association of Collegiate Registers and Admission Officers [AACRAO], 2015; Obama, 2009). Hence, the United States' low international college completion rate may ultimately lead to a "prescription of economic decline" (Obama, 2009, Third Challenge section). Despite the White House's initial step to make college "more accessible, affordable, and attainable" in 2013 (White House, 2016, October), the United States slipped from 15th internationally in undergraduate postsecondary degrees among young adults between the ages of 25 and 34 years (OECD, 2011) to 16th (OECD, 2015). Current statistics indicate that the United States is in 10th place internationally in the attainment of a tertiary (or postsecondary) college degree among young adults, behind such economic-shaping countries as Canada, Japan, Russia, and the United Kingdom (OECD, 2019). Overall, the United States still has a way to go in meeting the White House's higher educational goal.

Researchers have investigated the traditional and nontraditional academic performance variables associated with timely degree attainment and nondegree attainment among first-year students in postsecondary education.

For example, researchers in the field of educational psychology have found that the nontraditional factors of student motivation strongly influence first-semester student success in the first year, as well as during eight subsequent semesters (a time period equivalent to completion of a four-year undergraduate degree; Allen & Robbins, 2010; Slanger et al., 2015). Additionally, they found that poorly motivated students are likely to struggle academically (i.e., have a below-average first-semester GPA or cumulative GPA), experience academic stress, and drop out of school before attaining a college degree (Allen & Robbins, 2010; Slanger et al., 2015). However, it is currently unknown whether motivation beliefs significantly influence high and low levels of academic achievement among undergraduate students (Campbell & Fuqua, 2008; Gershenfeld et al., 2015). The purpose of my dissertation was to understand which motivational factors predicted academic performance (i.e., cumulative GPA) among community college students. An additional purpose was to determine which of the motivational factors, among gender and age groups, predicted cumulative GPA.

In this chapter, I review the empirical research on academic achievement and student motivation. Researchers have discovered several predictors that significantly affect students' goals of attaining an undergraduate college degree. These predictors fall under the following three categories: traditional and non-traditional, academic predictors,

and motivation. Traditional and non-traditional predictors include those associated with demographics, college integration, finances, and work hours. Academic predictors include those associated with GPA as early as the first semester of college. Motivation predictors include those clustered into three sub-categorical motivational groups: (a) attribution, optimism, pessimism, expectancies, and perceived control; (b) sources of motivation; and (c) goal type. I also review the theoretical framework of this study, which includes two empirically supported motivation theories related to the influence of motivation on student academic achievement in higher educational institutions. Finally, I bring attention to the issue in the field of clinical and educational psychology regarding which motivational factors strongly associate with college GPA.

Literature Research Strategy

I used the following databases as literature review resources: ERIC, Google Scholar, ProQuest Central Premier, PsycArticles, and SAGE Premier. I also used the Online Walden University Library to collect further resources. I used the following search terms, both alone and in combination: academic performance, college attainment, college graduates, degree attainment, GPA, first-year GPA, first-semester GPA, graduation, graduation GPA, honors program, motivation, motivational factors predictors, and psychosocial factors. To find articles associated with the dissertation sub-topics of academic achievement and student motivation, I used a combination of different databases and combined terms as follows:

Predictors of College Completion

- Traditional and nontraditional predictors.

  o SAGE Premier: predictors and college degree.

- Traditional academic predictor: academic achievement.

  o ERIC and SAGE Premier: first-year GPA and college graduates; first-semester GPA, graduation, and GPA; first-semester GPA, first-semester GPA, graduation, and honors program; first-semester GPA, graduation, and honors program.

- Nontraditional academic predictor: motivation.

  o PsycArticles and SAGE Premier: first-semester GPA, graduation, and motivation; degree attainment, academic performance, and motivation.

Motivational Predictors of Academic Achievement

- Motivation Factors.

  o ERIC, Google Scholar, and ProQuest Central Premier: GPA, academic performance, and motivational factors; first-semester GPA, GPA, and psychosocial factors; first-semester GPA, GPA, and motivation; low academic achievement, high academic achievement, and college students; motivation, RMP, and learning.

The majority of the database searches involved a preset limit to research published since 2008. I did not search for older research articles unless researchers highlighted them in their research studies.

Theoretical Framework: Reiss Theory of 16 Desires

Two theoretical frameworks for this study were Reiss's (2004, 2013) theory of 16

basic desires and his "six motivation reasons for low academic achievement" theory

(Reiss, 2009). Reiss proposed in his theory of 16 basic desires that there are innate

motivational factors (commonly known as basic desires intrinsic motives, or

psychological needs) that are universal and deeply embedded in human nature (Reiss,

2004, 2013). These basic desires are acceptance, curiosity, eating, family, honor,

idealism, independence, order, physical activity, power, romance, saving, social contact,

status, tranquility, and vengeance (Reiss, 2004, 2013). According to a recent 40-year

comprehensive meta-analysis on motivation and performance (achievement-related

behavior), there appears to be no quantitative review of the impact of Reiss motivational

constructs (as mediators) on academic achievement at the undergraduate level of

education (Cerasoli et al., 2014).

Reiss (2013) proposed the theory of 16 basic desires as the "only taxonomy of

human needs [or motives]" empirically derived from both explorative and confirmatory

factor analysis studies of what a diverse sample of individuals perceived as motivating

them (p. 159). These analytical studies, executed in two peer-reviewed studies and one

doctoral study, investigated both a 15-factor model (Havercamp, 1998) and a 16-factor

model (Havercamp & Reiss, 2003; Reiss & Havercamp, 1998). The research criteria for

the factorial analysis studies were limited to a theoretical assumption of fundamental

motives—namely that they are universal end goals responsible for "psychologically

significant behavior" (Reiss & Havercamp, 1998, p. 98).

The resulting basic desire factors from the factor-analytical work became the 16 psychometric scales of a standard assessment tool, the RMP and its school version, the RSMP. In description, the 16 basic desire factors are as follows:

- Acceptance: The desire for approval.

- Curiosity: The desire for cognition and understanding.

- Eating: The desire for food (not included in the RSMP school version).

- Family: The desire for family (e.g., raise a family or spend time with siblings);

- Honor: The desire for moral character.

- Idealism: The desire to improve society.

- Independence: The desire for self-reliance.

- Order: The desire for organization.

- Physical activity: The desire for muscle exercise.

- Power: The desire for influence or leadership.

- Romance: The desire for beauty and sex (not included in the RSMP school version).

- Saving: The desire to collect (not included in the RSMP school version).

- Social contact: The desire for peer companionship.

- Status the desire: For respect based on social standing.

- Tranquility: The desire to be free of anxiety and pain.

- Vengeance: The desire to confront those who offend (Reiss, 2013).

Six Motivation Reasons for Low Academic Achievement

Based on a review of the peer-reviewed research literature on 16 basic desires theory, Reiss proposed an additional theory: six motivation reasons for low academic achievement (Reiss, 2009, p. 224). Reiss's proposed that poor scholastic performance is a result of students experiencing either a weak or a strong basic desire associated with fundamental motive(s) as follows:

- Acceptance: High desire, fear of failure.

- Curiosity: Low desire, lack of need for cognition.

- Power: Low desire, lack of need for ambition.

- Honor: Low desire for or a lack of responsibility.

- Order: Low desire, lack of need to be organized, thoughtful, and careful.

- Vengeance: High desire for and predisposition toward confrontation (Reiss, 2009).

Reiss (2009) drew scientific evidence for the reliability of his additional theory (six motivation reasons for low academic achievement) from prior factor analysis studies and studies of the concurrent and criterion validity for each of the six RSMP scales that represent the fundamental motives in the 16 basic desires theory. Concerning the validity of the theoretical model, Reiss (2009, 2012) indicated that it is "anecdotal [rather] than scientific" evidence (p. 220). More specifically, it is anecdotal in that school psychologists used the school version of the RMP questionnaire (which includes the six fundamental factor motives noted in the model) to identify the motivational reasons for

poor academic achievement in approximately 40 school settings nationwide, according to 2012 data (IDS Publishing Corporation, 2017; Reiss, 2009, 2012). The second principle of the empirical theory of basic desires lends support to the model in which Reiss proposed that the fundamental motives have two characteristics: what is desired and how much is typically desired (Reiss, 2013). The primary reason Reiss (2009) established the theoretical model was to stimulate new empirical research on "motivation in schools" (p. 2).

Use of Reiss theory in previous studies. Taking into account Reiss's two interrelated theories on motivation, researchers further investigated which of the 13 motivation factors were significantly associated with academic achievement among students in their secondary level of education (Froiland et al., 2015; Kavanaugh, & Reiss, 2003). Academic achievement referred to various student GPA levels: above-average, average, and below-average (Froiland et al., 2015). Researchers use the standardized self-report assessment tool, the RSMP (Reiss, 2013), to identify the factors of the basic desires of school motivation as perceived by the students.

Among the research results, Froiland et al. (2015) found that the basic desire of intellectual curiosity was significantly associated with academic achievement. Furthermore, the authors found an indirect relationship between physical activity and intellectual curiosity that was significantly associated with academic achievement. The latter result indicated that both a strong desire for intellectual curiosity and a weak desire for physical activity were significantly associated with above-average academic

achievement. Conversely, both a low need for intellectual curiosity and a high need for physical activity were significantly associated with below-average academic achievement. Suggestions for further study included further examination of the association between the basic desires of motivation and academic achievement (Froiland et al., 2015).

Both of Reiss' two motivational theories (16 basic desires theory and six motivation reasons for low academic achievement) were useful in explaining the results of the present study. This study addressed which of the 13 basic desires of motivation predict undergraduate academic achievement. Furthermore, the predicted results addressed which of the basic desires of motivation, among gender and age groups, predict cumulative GPA.

Literature Review: Predictors of College Completion

The type of traditional and nontraditional factors associated with college completion include demographic information, enrollment status, grade scores, academic and social integration, remedial education, and academic motivation. The next subsections will review these areas in more detail.

Traditional and Nontraditional Factors

To address the yearly decline in the United States' international ranking in undergraduate level degrees, researchers have investigated the traditional and non-traditional academic performance variables associated with timely degree attainment and non-degree attainment among first-year students (Obama, 2009; OECD, 2011, 2015;

Slanger et al., 2015; Obama, 2009; OECD, 2011, 2015; Slanger et al., 2015). For

example, Attewell, Heil, and Reisel (2011) assessed the how attainment of an

undergraduate college degree related to both traditional and non-traditional academic

performance variables, guided by Tinto's (1975) integrative model of institutional

departure at both two-year and four-year academic institutions (i.e., community colleges,

universities). Tinto proposed that the academic integration (academic performance) and

social integration (i.e., extracurricular activities, peer-group interactions) of first-year

college students was positively related to college completion. Though Tinto proposed the

integrative model over 30 years ago, in a literature review of dominant theoretical

assumptions on non-completion in the last four decades, Melguizo (2011) found Tinto's

(1975, 2015) model to be a common theory used to explain the longitudinal process of

college incompletion. The independent academic performance variables in Attewell et

al.'s (2011) study included the following:

Traditional variables.

1. Race, ethnicity, and gender.

2. Parent's socioeconomic status: Income, net worth, and highest college degree.

3. Preparation: High school classes, high school GPA, and SAT scores.

4. First-year financial aid: Federal work study, Pell grants, federal loans, other
   forms of aid.

5. Academic and social integration: Student meetings with faculty outside class
   and student participation in study groups, sports, clubs, and events with

college peers.

6.   First-year remediation: Math, reading, and language.

Nontraditional variables.

1.   First-year work hours: Part-time, full-time, and non-traditional status: college

    part time; delayed enrollment; and non-traditional composite (independent,

    single parent, married, married with dependents.

The results of the Attewell et al.'s (2011) study showed a direct association

between the traditional and non-traditional academic performance variables and the

attainment (or non-attainment) of an undergraduate college degree. Given these results,

the meta-analysis justified the rationale for addressing both traditional and non-traditional

academic predictors in the dissertation. That is, both academic performance variables

predicted the "greatest numerical potential" for improving the yearly decline in the

United States' international ranking in undergraduate college degree completion at both

community colleges and four-year academic institutions (Attewell et al., 2011, p. 554).

   Academic achievement. In addition to investigating the traditional and non-

traditional academic achievement variables associated with timely degree attainment and

non-degree college degree attainment among undergraduate students, researchers have

explored whether the traditional academic performance variable first-year GPA affects

timely undergraduate degree attainment and non-degree undergraduate attainment.

Gayles (2012) examined institutional student data on whether first-year GPA strongly

predicted both the continuous dependent variable cumulative GPA and the dependent

variables of general undergraduate college completion and honors undergraduate college completion. The sample population included full-time university students ($N = 8,743$) enrolled as first-year students in the fall of 1998. In addition to Gayles's study, other researchers have examined whether one of the earliest measures of academic performance—first-year, first-semester GPA—predicted undergraduate college completion (general graduation, honors graduation, and non-graduation).

Raju and Schumacker (2015) and Campbell and Fuqua (2008) examined institutional student data to determine which first-year traditional and non-traditional variables affect completion of an undergraduate degree. The sample population in Raju and Schumacker's (2015) study was full-time students ($N = 22,099$) enrolled as first-year students in the fall of 1995. Included among the post-college independent variables was first-semester GPA. The sample population in Campbell and Fuqua's (2008) study was first-year university students ($N = 336$) enrolled in an honors program. Categorical factors of the dependent variable *college completion* included the following three comparison groups (award groups): (a) completers (students who completed the honors degree program, $N = 62$); (b) partial completers (students who completed the general honors award versus the degree honors program, $N = 73$); and (c) non-completers (students who completed no honors awards). Included among the post-college independent variables was first-semester GPA. The latter referred to students' average first-semester GPA at the targeted time of honors graduation (fall of 2000). Together, the

researchers examined the first-year traditional academic factors that significantly predict college completion of an undergraduate degree.

Gayles (2012) found that first-year GPA predicted undergraduate academic performance (general graduation and honors graduation) across a diverse sample population of university first-year students. Specifically, the results indicated that first-year GPA explained more than 50% to 65% of the variation in cumulative GPA among the diverse sample group of students. Both Raju and Schumacker (2015) and Campbell and Fuqua (2008) found that academic achievement (operationalized as first-year, first-semester GPA) predicted undergraduate college completion for a diverse sample population of first-year students. Specifically, Raju and Schumacker (2015) found that, among the general sample of students who did not graduate ($N = 7,293$), 39% ($N = 2,845$) had a freshman, first-semester GPA of less than 2.25. On the other hand, Campbell and Fuqua (2008) found that, when comparing the first-semester GPA averages of three undergraduate degree-seeking groups of honor students (completers, partial completers, and non-completers), the non-completer group had significantly lower first-year, first-semester GPA (3.34) than the other two groups: 3.77 for partial completers and 3.84 for completers.

Taken together, the quantitative studies by Gayles (2012), Raju and Schumacker (2015), and Campbell and Fuqua (2008) suggest that first-year students who do not perform well academically (i.e., have a low GPA) are more likely to not complete an undergraduate degree program. These studies also provide a rationale for addressing the

traditional academic achievement predictor, freshmen, first-semester GPA, as one of the dissertation topics of interest as this variable was found to be a significant predictor of potential student drop outs among two contrasting groups of students (honor students and at-risk students) prior to graduation. Because the research findings suggested academic achievement predicted college completion, future investigation (in accord with the dissertation research questions) remained on what whether motivation plays a significant role in academic achievement up to the time of college completion (Campbell & Fuqua, 2008; Gershenfeld et al., 2015).

Motivation. Along with research investigations on the effect of the traditional academic performance variable, GPA, on both completion and non-completion of an undergraduate degree, researchers have investigated whether the non-traditional academic variable of academic motivation affects completion and non-completion of an undergraduate college degree (Allen & Robbins, 2010; Slanger et al et al., 2015). Allen and Robbins (2010) investigated whether academic motivation directly affected timely undergraduate degree attainment among a diverse group of college students across 15 four-year (N= 3,072) and 13 two-year ($N = 788$) postsecondary institutions. The academic motivational factor of academic discipline refered to the students' perceptions on doing academic tasks and the degree they perceived themselves as both hardworking and conscientious. Timely degree attainment referred to earning either an associate degree (or completion of a certificate program) at a two-year college or community college or a bachelor's degree at a four-year college or university. First-year academic

performance referred to first-year cumulative GPA.

Slanger et al. (2015) investigated whether there was an association between academic motivation, academic success, and student retention over eight semesters (a period of time equivalent to a six-year bachelor's college degree) and cumulative course-load capacity. The sample population comprised of 10 cohorts (2002–2011) of students ($N = 6,043$) across different circumstances from one Midwestern university. Student circumstances included those who shared a particular experience together within a particular time span particularly. Circumstances included summer orientation (2002), mandatory freshmen orientation one credit course (2003), enrollment in selected academic colleges (2004–2010), enrollment of college athletes, and conditional admits (2007–2010). Cumulative course load, which referred to the division of number of credits earned over the number of graded classes, indicated students' capability to be successful in navigating a full course load. For instance, students with a poor or high GPA taking 3 credit hour courses is qualitatively different than students who earned a poor or high GPA taking 1 credit hour courses. The motivational constructs and associated factors in Slanger et al.'s study included the following:

- Academic motivation: Study habits, intellectual interests, verbal and writing confidence, math and science confidence, desire to finish college, and attitude towards college.
- General coping ability: Sociability, family emotional support, opinion tolerance, career closure, and sense of financial security.

- Receptivity to support services: Career counseling, financial counseling, academic assistance, and social enrichment.

In addition to examining whether motivation predicted college academic performance, Slanger et al. combined the variable factors of motivation into four compound variables to examine whether motivation predicted cumulative GPA over eight semesters. The definitions of the combined factors were as follows:

- Dropout proneness: Students' overall inclination to drop out college prior to completing their degree.

- Predicted academic difficulty: Which students were most likely to have a low GPA after their first semester in college.

- Educational stress: Students' overall college experience of stress.

- Receptivity of institutional help: How responsive students' were likely to be toward intervention via college support services (personal counseling and academic assistance; Noel-Levitz, 2011; Slanger et al., 2015).

Among the study results, Allen and Robbins (2010) found that academic motivation appeared to affect timely degree completion at a two-year college or community college ($\beta = 0.082$, $p < .05$) or a bachelor's degree at a four-year college or university ($\beta = 0.218$, $p < .01$), as a result of its indirect effect on first-year academic performance. On the other hand, Slanger et al. (2015) found that motivational factors of academic motivation, general coping, and receptivity to support services strongly influenced both the earliest indication of academic achievement (first-year, first-semester

GPA) and ongoing academic performance (cumulative GPA) across eight semesters (a

time period equivalent to the completion of a bachelor's degree). More specifically, the

authors found that motivation predicted first-year, first-semester GPA and cumulative

GPA across eight semesters using 25% (a quartile) of the predicted 2009 first-semester

GPAs (using 2003 cohort data), in comparison to the quartile of actual 2009 first-year,

first-semester GPA. Slanger et al. selected the 2003 cohort data (out of the 10 cohort

groups) for predicting 2009 GPAs because it was the largest data set and had the best

assessment consistency in a mandatory first-year college skills course. In addition, 33%

(a tertile) of the 2009 predicted course-load capacity results were consistent in relation to

the actual 2009 tertile course-load capacity results as follows:

Quartile cohort data.

1. Motivational factors found to predict 2009 first-semester GPA (using 2003
   cohort data) were similar to the actual effect of the motivational factors on
   2009 first-semester GPA.

2. Motivational factors found to predict 2009 second-semester GPAs were
   similar to the actual effect of the motivation factors on 2009 second-semester
   GPAs.

Tertile cohort data.

1. Predicted first semester 2009 load capacity was similar to actual first semester
   2009 load capacity.

2. Predicted second semester 2009 load capacity was similar to actual first semester 2009 load capacity.

Both of Allen and Robbins (2010) and Slanger et al.'s (2015) quantitative studies indicated that poorly motivated students likely (a) struggled academically (i.e., had a below-average first-semester GPA and below-average cumulative GPA), (b) experienced academic stress, and (c) were inclined to drop out of school prior to a timely attainment of an undergraduate college degree. In light of the indirect effect of motivation (via student GPA) on college completion, researchers focused on motivational predictors as points of intervention for improving academic achievement up to the time of college completion (Krumrei-Mancuso et al., 2013).

Motivational predictors of academic achievement. Among the motivational predictors examined for interventions to improve academic achievement up to the time of college completion were students' perceptions of academic and performance capabilities. In a 13-year meta-analysis (1997–2010), Richardson et al. (2012) explored the motivational group factors correlated with student GPA. Research studies ($N = 315$) were extracted from two databases: PsycINFO and the Web of Knowledge. The definition of undergraduate academic performance, in terms of tertiary (university) GPA, included both cumulative GPA and course GPA.

The three motivational groups, along with the description of their factors, were as follows:

1. Attributions, optimism, pessimism, expectancies, and perceived control:

a. Locus of control: Perception of control over life occurrences and ending results.

b. Pessimistic attributional style: Perception of control over negative life occurrences and ending results.

c. Optimism: General viewpoint that good things will occur.

d. Academic self-efficacy: Perception of academic ability, academic control, and academic self-concept.

e. Performance self-efficacy: Perception of performance ability.

2. Source of motivation:

a. Self-esteem: Perception of self-worth (i.e., self like, good qualities).

b. Academic intrinsic motivation: Satisfaction of academic intrinsic learning (i.e., self-interest in the experience).

c. Academic extrinsic motivation: Acquisition of knowledge and engagement in academic tasks for instrumental purposes (to satisfy others or receive an award or reward).

3. Goal type:

a. Learning goal orientation: Disposition toward the development or demonstration of ability in achievement situations: knowledge, mastery, and skills (i.e., learning as much as possible or selecting challenging course material that promotes learning).

b. Performance goal orientation: Achievement endeavors to show competence comparative to others (i.e., thoughts of outperforming classmates or doing well in class to show academic capability to others).

c. Avoidance goal type: Avoidance of learned tasks that may demonstrate inabilities or under-achievement (i.e., motivation to achieve due to the fear of under-performing).

d. Grade goal: Self-allocation of nominal goal standards (i.e., on a scale from 0% to 100%, the smallest percentage grade goal student would be satisfied with).

The results from Richardson et al.'s (2012) long-term meta-analysis indicated that, from the three motivational groups, three factors significantly correlated with tertiary GPA. More specially, grade goal (self-assigned minimum standards), academic self-efficacy (general perceptions of academic ability), and performance self-efficacy (efforts to demonstrate competency) significantly predicted cumulative GPA and course GPA for a diverse population of undergraduate students, including first-year through fourth-year students.

In addition to Richardson et al.'s (2012) long-term meta-analysis, researchers have examined the effect of student motivation on first-year academic achievement among a sample population of first-year students in both two-year and four-year academic institutions. As previously mentioned, Allen and Robbins (2010) investigated whether the motivational variable of self-discipline directly affected timely degree

attainment or indirectly affected timely degree attainment (via first-year GPA) for a diverse group of college students across both two-year (i.e., community college) and four-year (i.e., university) educational institutions. As previously mentioned, the construct of self-discipline referred to students' perceptions of the effort they put into academic tasks, their conscientiousness, and how hardworking they were. This definition of self-discipline fits the description of the motivational construct *performance self-efficacy* (motivational predictor of tertiary GPA) in Richardson et al.'s (2012) meta-analysis. The definition of performance self-efficacy included students' "perception of academic performance" in the areas of scholastic skills and their scholastic abilities (Richardson et al., 2012, p. 356).

Further expanding on the effect of student motivation on academic achievement, Krumrei-Mancuso et al. (2013) investigated whether the psychosocial variable of academic self-efficacy strongly influenced both the earliest measure of academic performance (freshmen, first-semester GPA) and the latter form of academic performance (end of the first-year GPA). Krumrei-Mancuso et al. defined academic self-efficacy as students' degree of confidence in their academic abilities (GPA), awareness of their study efforts (hardworking, conscientious), and expectation of academic success (i.e., completing college). This independent variable also fits the description of the motivational construct *academic self-efficacy* (a resulting motivational predictor of tertiary GPA) in Richardson et al.'s (2012) meta-analysis. The description of academic self-efficacy was a "general perception of academic capability" in the areas of self-

confidence, academic self-concept, and academic control (Richardson et al., 2012, p. 353).

The results of Allen and Robbins' (2010) and Krumrei-Mancuso et al.'s (2013) empirical studies aligned with those of the meta-analysis by Richardson et al. (2012) because their results indicated that student motivation significantly affected first-year academic achievement. Allen and Robbins (2010) found that the motivational construct self-discipline strongly predicted cumulative first-year GPA. Expanding on this result, Krumrei-Mancuso et al. (2013) found that the psychosocial (or motivational) variable academic self-efficacy strongly influenced freshmen, first-semester GPA and end-of-the-first-year GPA. Overall, Richardson et al. (2012), Krumrei-Mancuso et al. (2013), and Allen and Robbins (2010), suggested that the motivational factors of general perceptions of academic ability and academic performance significantly predicted freshmen, first-semester GPA and undergraduate college completion in a diverse sample of students.

Sources of motivation. In addition to examining the motivational factors that predict student first-year GPA as early as the first semester of college, researchers have examined the motivational factors that predict group membership in above-average or below-average academic performance groups (Stover et al., 2014). Academic performance refers to student GPA. Furthermore, researchers have examined the differences in motivational factors associated with group membership in both above-average and below-average academic performances. The control group was students with average academic performance (Singh, 2014).

Stover et al. (2014) examined the role of self-determined motivation on membership in both high and low academic performance groups. The sample population was undergraduate students from Buenos Aires University in Buenos Aires, Argentina. Based on Argentina's universal tertiary grading scale, achievement groups ranged from 0 to 10, with 4 as the minimum passing grade (Foreign Credits Inc., 2012; Glave, 2013). The percentage ranges of the grading numbers corresponded to the following letter grades: (a) high-achievement numbers between 8.0 and 10.00 (A- to A+; 25%), (b) average-achievement numbers between 4.00 and 8.99 (50%), and (c) low-achievement numbers between 0.00 and 3.99 (F; 75%; Foreign Credits Inc., 2012; Glave, 2013).

Self-determined motivation, in accordance with Ryan and Deci's (2000) self-determination theory, referred to an energy source and direction in behaviors expressed through a continuum of increased self-determination with three core positions reflecting the degree of autonomic behavior: amotivation, extrinsic motivation, and intrinsic motivation. Stover et al. (2014) built upon the self-determination theory by hypothesizing that motivational behavior would indirectly influence academic achievement through the use of learning strategies. The definitions of the motivational variables and associated factors were as follows:

Intrinsic motivation (IM). Performing an activity for the innate satisfaction derived from the activity itself (Ryan & Deci, 2000).

1. IM orientation towards stimulating experiences: Performing an activity for the innate satisfaction derived from stimulating experiences (aesthetics, intellectual, and sensorial).

2. IM orientation towards knowledge: Performing an activity for the innate satisfaction derived from the pleasure of learning.

3. IM orientation towards achievement (Ima): Performing an activity for the innate satisfaction derived from overcoming personal limitations and accomplishing goals, pursuits, or difficult activities.

Extrinsic motivation (EM). Performing an activity for the purpose of attaining some separable outcome.

1. EM identified regulation (EMidr): Performing an activity for extrinsic motives, including those related to societal values, entering the labor market, and improvement of abilities.

2. EM interjected regulation (EMintr): Performing activity to improve self-esteem or to avoid anxiety and guilt in such areas as not being successful, not achieving desired results, or not meeting family expectations.

3. EM external regulation (EMer): Performing activity to avoid punishments or to obtain rewards.

Amotivation. Discerning a lack of control over events, lack of ability, and absence of pursuit.

1. Organization and planning: Organizing, concentrating, and time managing academic activities.

2. Abilities to prepare exams: Valuing the use of test strategies, knowledge of instructions, and anticipates test contents.

3. Motivation: Persevering and dedicating energy towards studies.

4. Resources for learning: Contemplating the use of graphic tables, conceptual maps, highlighting, and underlining.

5. Control and consolidation strategies (CCE): Revising academic materials and contents.

6. Abilities to rank information (ARI): Selecting the key information to learn. (Stover et al., 2014).

In comparison to Stover et al.'s (2014) research study, Singh (2014) examined the differences in the motivational factors associated with membership in above-average or below-average academic performances using students with average academic performance as the control group. The sample population included graduate students from Punjabi University in Punjab, India. The researchers determined membership in the achievement groups based on academic "percentage marks" (i.e., the number of points attained at the end of academic course work; Punjabi University, 2015, p. 2). The ranges of the percentage marks (m) equated to the following letter grades: (a) above-average ranges of m between 75 and 90 were A to A+, (b) average ranges of m between 25 and 75 were C to B+, and (c) below-average ranges of m less than 25 were D (Punjabi

University, 2015). The motivational beliefs' components and associated constructs, as measured by the Motivational Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991), were as follows:

1. Value

   a. IM: Internal forces that influence student performance.

   b. EM: Outside rewards and punishment that influence a student's academic achievement.

   c. Task value: Importance of tasks or activities.

2. Expectancy

   a. Control of learning beliefs: A student's beliefs and effort to learn.

   b. Self-efficacy: Beliefs that assist a student organize and execute a specific action that produces a given attainment.

3. Affective

   a. Test anxiety: A student's worry about taking tests (Singh, 2014).

Both Stover et al. (2014) and Singh (2014) found significant differences between the academic achievement groups in relation to motivation. Stover et al. (2014) found that self-determined motivation significantly predicted academic performance through three of the four learning strategy factors: learning and planning, motivation, and resources for learning. Singh (2014) found that there was a significant difference between high and average achievement groups on the motivational beliefs of task value and

control of learning beliefs. Singh also found that there was a significant difference in task value between the average and high achievers groups.

The results of Singh's (2014) study, though significant, were more likely inaccurate, according to Nausheen's (2016) recent cross-cultural exploratory analysis of the MSLQ motivation scales in another sample of undergraduate students from Punjabi University in Punjab, India. Because the Pakistani students' conceptions of their motivations to learn is different to those of U.S. students, Nausheen (2016) significantly modified (by deleting factor items) the factor structure of the MSLQ motivational scales with an acceptable Cronbach alpha measurement of internal consistency. Nausheen suggested that future research was necessary to further develop and carefully adapt the MSLQ for use in the context of Pakistani higher education and in other Eastern cultures. Overall, the studies by Stover et al. (2014) and Singh (2014) suggested that the degree to which students designed, organized, adjusted, and persevered in a schedule and the degree to which they anticipated possible evaluations determined their membership in high or low academic performance groups.

<div align="center">**Summary**</div>

The review of the literature on both the traditional factors of student academic achievement and the nontraditional variables strongly associated with academic achievement provided insight into probable reasons for the yearly decline in the United States' international ranking in undergraduate college degrees. Campbell and Fuqua (2008) and Gershenfeld et al. (2015) found that the traditional factor of academic

achievement (freshmen, first-semester GPA) was significantly associated with timely degree attainment within a six-year period. Allen and Robbins (2010) and Slanger et al. (2015) found that the nontraditional factors of motivation had a strong effect on timely degree attainment via first-year GPA or freshmen, first-semester GPA. The motivational factors included those associated with academic self-discipline, academic motivation, general coping ability, and receptivity to support services. In addition, Slanger et al. (2015) found that the compounding factors of student motivation (namely academic difficulties and dropout proneness) played a significant role in student retention over a period of eight semesters.

Researchers have investigated types of motivational predictors as points of intervention for improving academic achievement up to the time of college completion, which fall under three classifications of motivation (Froiland et al., 2015; Krumrei-Mancuso et al., 2013; Richardson et al., 2012; Singh, 2014; Stover et al., 2014). The motivational classifications are as follows: (a) attribution, optimism, pessimism, expectancies, and perceived control; (b) sources of motivation; and (c) goal types (Krumrei-Mancuso et al., 2013; Richardson et al., 2012). Under the subclassification of expectancies and the classification of goal types, Richardson et al. (2012) and Krumrei-Mancuso et al. (2013) found that multiple motivational factors—academic self-efficacy, performance self-efficacy, and goal setting—significantly predicted student GPA scores (i.e., tertiary, course, cumulative, semester) among a diverse population of undergraduate college students: first-year through fourth-year students.

Under the remaining classification of motivation, sources of motivation, Stover et al. (2014), in his study on the role of self-determined motivation on membership in both high and low academic performances, found that three types of motivation (innate, external, and amotivation) significantly predicted academic performance through three learning strategy factors. These factors were learning and planning, motivation (i.e., persevering and dedicating energy towards studies), and resources for learning. In other words, Stover suggested that the degree to which students designed, organized, adjusted, and persevered in a schedule and the degree to which they anticipated possible evaluations determined their membership in high or low academic performance groups.

Chapter Summary

Given the recent empirical research on academic achievement and student motivation on a diverse population of undergraduate students, research scholars have suggested further investigation into the following under-researched areas:

- The motivational factors that affect first-semester, below-average academic achievement among students noted as in the "at-risk zone" of student performance (Gershenfeld et al., 2015, p. 17).

- The motivational factors that affect first semester above-average academic achievement among honor students (Campbell & Fuqua, 2008).

- Whether undergraduate honor students and undergraduate students on academic probation differ in their motivation beliefs found to be significantly associated with their academic performance (Singh, 2014).

Overall, there appears to be a gap in the literature related to the motivational factors that predict academic achievement. Froiland et al. (2015) and Richardson et al. (2012) suggested that future research on the predictors of academic achievement should include a range of previously tested cross-domain predictors within a theoretical framework that is goal-oriented and personality-trait specific. One of these theoretical frameworks is Reiss' theory of the 16 basic desires of motivation (Froiland et al., 2015). Cross-domain predictors include those associated with academic motivation under the domains of expectancies, sources of motivation, and goal types. This dissertation investigated whether there were significant relationships between the RSMP factor scales (within the theoretical framework of Reiss's theory) and cumulative GPA. An additional purpose was to determine the differences in motivational factors across gender and age groups. In the next chapter, I describe the methodology used to answer the research questions.

Chapter 3: Research Methods

Introduction

The purpose of the present quantitative study was to understand which motivational factors predict academic performance (i.e., cumulative GPA) among students enrolled at a community college in the western United States. An additional purpose was to determine which of the motivational factors, among gender and age groups, predicted cumulative GPA. Major sections of this chapter cover research design and rationale, methodology, threats to validity, ethical procedures, and chapter summary. In the Research Design section, I provide a rationale for my selection of a quantitative, cross-sectional survey design. In the Methods section, I describe the convenience sampling technique used to increase the net of eligible participants in a relatively expedient and inexpensive manner. I also describe how I determined the projected sample size to compare with the actual sample size. Furthermore, I discuss and clarify why I selected the RSMP as the preferred independent measure of motivation. To protect the community college's identity (per IRB agreement), I did not use references when I reviewed prior institutional school data.

In the Analysis of Data section, I explain why I chose an ordinal logistic regression model to determine which of the independent variables best predicted the dependent variables scores. In the Threats to Validity section, I review the steps taken to avoid possible threats to the statistical results, including the reliability and validity of the test instrument, sampling procedures, and inclusion and accountability of the research

question variables. Finally, in the Ethical Procedures section, I review how administrative and faculty members from the community college under study assisted in the recruitment of student participants. I also discuss the treatment of study participants and data.

Study Variables

The independent variables in the current study were Reiss motivational factors, age, and gender. The motivation factors were the 13 empirically-derived factor scales of the standardized school measurement tool derived from the RSMP (IDS Publishing Corporation, 2017; Reiss, 2013). The qualifying age groups included the following: 18, 19 to 24, 25 to 39, 40 to 64, and 65 years or older. The dependent variable in my study was cumulative GPA, ranked into six ordinal groups: (a) less than 2.0, (b) 2.0–2.24, (c) 2.25–3.74, (d) 2.75–3.24, (e) 3.25–2.74, and (f) 3.75–4.00. To examine whether the RSMP motivational factors, age, and gender predicted cumulative GPA level, I designed the study to examine the following research questions:

RQ 1: Does the RSMP factor of social contact predict different levels of GPA?

RQ 2: Does the RSMP factor of curiosity predict different levels of GPA?

RQ 3: Does the RSMP factor of honor predict different levels of GPA?

RQ 4: Does the RSMP factor of family predict different levels of GPA?

RQ 5: Does the RSMP factor of independence predict different levels of GPA?

RQ 6: Does the RSMP factor of power predict different levels of GPA?

RQ 7: Does the RSMP factor of order predict different levels of GPA?

RQ 8: Does the RSMP factor of idealism predict different levels of GPA?

RQ 9: Does the RSMP factor of status predict different levels of GPA?

RQ 10: Does the RSMP factor of vengeance predict different levels of GPA?

RQ 11: Does the RSMP factor of physical exercise predict different levels of GPA?

RQ 12: Does the RSMP factor of acceptance predict different levels of GPA?

RQ 13: Does the RSMP factor of tranquility predict different levels of GPA?

RQ 14: Do the RSMP factors and gender predict different levels of GPA?

RQ 15: Do the RSMP factors and age predict different levels of GPA?

Time and Resource Constraints

I used a quantitative, cross-sectional survey design in this study. In comparison to a longitudinal survey, a cross-sectional survey involves the collection of data at a single point in time rather than at two or more points in time (Sedgwick, 2014; Tourangeau, 2015). The personal benefits of collecting data at a single point of time include the completion of the study within the time period stipulated by Walden University and within an affordable cost bracket (i.e., costs related to study advertisement flyers, transportation costs, and complimentary gifts for participation).

Study Design

Broadly, a research design refers to a plan that moves from a philosophical worldview (or paradigm) towards a systematic arrangement of research methodology (Creswell, 2014; Harwell, 2013). The philosophical worldview constructs that guide the methodology of a research study are as follows:

- Ontology: What is the nature of reality or the knowable?

- Epistemology: What is the nature of the relationship between the inquirer and what is known (Scotland, 2012; Taylor & Medina, 2013)?

The type of philosophical paradigm researchers follow directly affects (a) what they discover, (b) the conclusive ideas they derive from these discoveries, and (c) whether these conclusive ideas generate valid and reliable knowledge in the social sciences (Bean, 2011; Harwell, 2013). In my study, I used a quantitative, cross-sectional survey design grounded within the components of a philosophical worldview.

The philosophical worldview that underlies my quantitative research design is post-positivism. The ontological perspective of post-positivism is *critical realism*; that is, there is an independent reality to discover in my research study, independent of my perspective, though it cannot be truly known (Gray, 2014; Scotland, 2012). The epistemological perspective of post-positivism is modified objectivism; that is, there is an independent reality to study, but that all observations are inherently fallible (Gray, 2014). Given the ontological and epistemological perspectives of critical realism and modified objectivism, I generated theory-driven hypotheses. I used inferential statistics to show the likelihood that the resulting observations were true.

The scientific model that guided my quantitative research design was the hypothetico-deductive model. This type of scientific model involves the formulation of hypotheses through empirical based theory and peer-reviewed research literature (Barker, Pistrang, & Elliott, 2016; Tariq, 2015). Additionally, the model describes how best to arrange the research conditions to permit the analysis of research questions and

associated hypotheses. I arranged the research conditions by (a) group selection by group characteristic, (b) group types (random assignment or pre-existing), and (c) group conditions (experimental or non-experimental; Kazdin, 2016). In consideration of the hypothetico-deductive model, I categorized the dependent variable, cumulative GPA, into six groups: (a) less than 2.00, (b) 2.00–2.24, (c) 2.25–3.74, (d) 2.75–3.24, (e) 3.25–2.74, and (f) 3.75–4.00. Furthermore, I categorized the independent variable age into five age groups: 18 years old, 19–24 years old, 25–39 years old, 40–64 years old, and 65 years old or older. The groups were under non-experimental conditions and were pre-existing, that is, the pre-existing variables defined the groups for GPA, gender, and age.

Summary

In sum, I designed the study to examine whether the 13 RSMP motivational factors, age, and gender predicted cumulative GPA level. I used a quantitative, cross-sectional survey design, meaning that I collected data at a single point of time. The foundation of the research design was a postpositivism worldview and in accord with the hypothetico-deductive (scientific) model. This philosophical worldview and scientific method provided the groundwork to (a) generate theory-driven research questions, (b) select inferential statistics to test the hypotheses, and (c) arrange the research conditions by group selection (i.e., academic achievement), group type (i.e., pre-existing), and group condition (i.e., non-experimental).

Methodology

In the Methodology section, I review the study's quantitative cross-sectional design, discuss the targeted population of interest, explain the sampling strategy and procedures, describe the recruitment and data collection procedures, and expand on the instrumentation and operationalization of the constructs. I also discuss the software I used for data analysis and the descriptive and inferential statistical methods used to test the null hypotheses (see Table 2). Moreover, I discuss the threats to internal and external validity and the ethical procedures pertaining to recruitment, anonymity, confidentiality, data collection, treatment of data, and protection of confidential data.

Population

For the initial study design, I defined two levels of the dependent variable academic achievement. These two levels were students on academic probation and students in the honors program. Due to the low number of study participants, I revised the original study design whereas I redefined the dependent variable academic achievement as cumulative GPA. A description of the target population and sample for both the initial and revised study designs follows.

Initial study design. In the fall semester of 2018, I recruited two groups of students at a community college located in the western region of the United States. The recruitment groups included students in the honors program and students on academic probation. The students were members of the two academic groups described in the original research questions, as follows:

RQ 1: Does the RSMP factor of social contact predict different levels of GPA?

RQ 2: Does the RSMP factor of curiosity predict different levels of GPA?

Initial targeted population. The recruitment groups included students in the honors program and students on academic probation. According to the 2017–2018 community college student handbook, students are put on academic probation if, after taking 12 or more credits, their cumulative GPA is less than 1.60 (for students who have taken 12–15 credits) or less than 1.75 (for 16–30 credits). According to the honors program webpage, students in the honors program must meet the following requirements: (a) maintain a cumulative GPA of 3.25, (b) have a full-time status, and (c) fulfill a time-applicable honors contract or honors project. The number of first-time students on academic probation at the community college in the spring of 2018 was 169 students (Associate Dean of Student Affairs, personal communication, February 2, 2018). The number of students in the honors program in the spring of 2018 was 355 (Dean of the Honors program, personal communication, February 6, 2018). Overall, the targeted population size was 524 (i.e., 355 honor students plus 169 first-time students on academic probation).

Sample alignment to population. Out of the total number of qualifying student volunteers (N = 79), only five students, between the ages of 18 and 24, participated in the study; this means that 1% of the targeted population participated.

Current study design. Due to the low rate of student participation in the 2018 fall semester study, I revised the study intent, research questions, and sampling strategy.

The updated study intent (for the spring semester of 2019) was to gain a better understanding of which motivational factors might predict different levels of academic performance. The number of research questions increased from two to 15 (see the Introduction section of Chapter 3). Accordingly, the first 13 questions pertained to the individual effect of each of the RSMP scales on cumulative GPA. The 14th question related to the effects of all RSMP factors, along with gender. The 15th question examined the effects of the RSMP factors, along with age.

In the revised study, the dependent variable included the following GPA levels: (a) less than 2.0, (b) 2.0–2.24, (c) 2.25–3.74, (d) 2.75–3.24, (e) 3.25–2.74, and (f) 3.75–4.00. The independent variables remained the same—namely, the 13 Reiss motivational factors, age, and gender. However, the number of qualifying age groups increased from two age groups (18 years old and 19–24 years old) to five age groups (18 years old, 19–24 years old, 25–39 years old, 40–64 years old, and 65 years old or older). Overall, the current study examined the effect of the study variables: Reiss motivation factors, age, and gender on cumulative GPA. The updated sample strategy was to test the students while in class (vs. a single testing site) using an online survey format of the demographic questionnaire and the RSMP survey (with the original paper-based format as an option).

Current targeted population. The recruited sample included students enrolled in developmental and introductory level academic courses. I targeted students in these classes because these classes more likely included young adults who, according to Erikson's (1968) theory of psychosocial development, had an interest in the dissertation

study's topic: the relationship between motivation and academic achievement. Erikson

theorized that, within their lifetime, individuals progress through eight developmental

stages characterized by distinct psychological issues they must resolve (Erikson &

Erickson, 1982; Erikson, 1968, 1970). Researchers found that Erickson's fifth and sixth

developmental stages (adolescence [12–18 years old] and young adulthood [19–40 years

old], respectively) included individuals most likely to be in college. Areas of association

within these stages include (a) cognitive developmental patterns (Sacco, 2013), (b)

intrinsic values of self-growth (Hope, Milyavskaya, Holding, & Koestner, 2014), (c)

motivation (Matsushima & Ozaki, 2015), and (d) academic achievement (Goguen et al.,

2010). Overall, the intention of the dissertation study was to recruit college students, who

would be more likely to complete the study survey because of their self-interest in

identifying the types of motivations predict cumulative GPA.

   Sample alignment to population. I conducted the study at a community college

located in the western United States. The sample closely represented the targeted college

population. According to the 2018 spring *45th Day* institutional statistics on the

community college, most of the students (65%) of the total student population ($N =$

7,486) were under 25 years of age. Of the students who participated in the study ($N =$

459), most of the students (85%) were under 25 years of age. Both the sample and

population statistical results fit the age groups noted in Erickson's developmental stages

five (adolescence: 12–18) and six (young adulthood (19–40).

Summary. I indicated that the majority of the targeted population and sample fit the description of Erickson's fifth and sixth life stages of development of college students between the ages of 18-40. As such, I proposed that the majority of sample likely participated in the dissertation study because of their self-interest in the study's topic.

Sampling Strategy and Procedures

Just as student recruitment methods can significantly influence sample variability (Demerouti & Rispens, 2014), sampling methods can have a significant impact on whether or not the research study results will generalize to a larger population (Etikan, Musa, & Alkassim, 2016). Given the necessity of examining the association of different levels of students' cumulative GPA with 13 motivational factors, gender, and age among community college students, I employed a convenience sampling method. The convenience method is common in quantitative research (Elfil & Negida,2017; Etikan et al., 2016). Criterion for using this type of sampling method is that the sample population be (a) easily accessible, (b) within geographic proximity, (c) available at a given time, or (d) willing to participate for the purpose of the study (Etikan et al., 2016). With this criterion in mind, I used the convenience method to save time, that is, to complete the study within the IRB allotted time period of two semesters.

Justification. Criterion for using the random sampling method does not include the selection of group participants who are willing to volunteer for the study or who the researcher expects to cooperate (Banerjee & Chaudhury, 2010). From a theoretical perspective, I ruled out the use of the random sampling method because the targeted

population (students registered in developmental and introductory courses) were more likely to be young adults who showed a cognitive interest in the study's topic of academic achievement and motivation. These students hence had a desire to both participate in the study and cooperate in the completion of the psychological assessment.

In comparison with the convenience sampling method, the purposeful sampling method is common in qualitative research. The prerequisite for the purposeful sampling method is that it "cannot be used when the variables in the study are quantitative in nature" (Etikan et al., 2016). On the basis of this prerequisite, purposeful sampling did not appear to be a viable sampling method to use in my study. Hence, I designed the research question variables to be quantitative in nature.

Overall, I determined that the convenience sampling method was best suited for the study. The foremost reason was that I could acquire statistical data that was likely to be valid, in that it represents the homogeneous population of the sample drawn. More specifically, there will be no change in the statistical data if the sample were randomly selected, difficult to reach, outside geographic proximity, or unavailable at a specific time. I also chose this sampling strategy because my geographic proximity to the college allowed for easier access to the target population.

Sampling frame. The generalizability of educational research findings from the sample to the target population depends on definitive sampling methods. Such methods include not only a clear and identifiable description of the targeted population, specific procedures for how the sample was drawn, but also a sampling frame (Elfil & Negida,

2017). A sampling frame refers to a formal list of basic units (e.g., individuals, institutional systems) who make up a targeted population in a research study (Martínez-Mesa, González-Chica, Duquia, Bonamigo, & Bastos, 2016; Salazar, Crosby, & DiClemente, 2015). In the present study, the sampling frame was college students (registered in developmental and introductory classes) at a community college in the western region of the United States.

 Inclusive and exclusive criteria. Inclusion and exclusion criteria define who makes up the study sample. By definition, inclusion criterion identifies the study population in a reliable and unbiased manner (Garg, 2016). In contrast, exclusion criteria are any factors that disqualify potential participants from a study (Garg, 2016). The exclusion criterion is thus an all-encompassing factor of the inclusion criterion.

 The criterion for inclusion is the samples' ranked level of cumulative GPA: less than 2.0, 2.0-2. 24, 2.25-2.74, 2.75-3.24, 3.25-3.74, or 3.75-4.0. Due to a federal school regulation that prohibits accessing student grades via registrar education records (as well as student directory information to recruit them) without students' prior permission, it was impossible to recruit the total targeted population in the study. Though I was not able to attain an all-inclusive sampling frame, by clearly and identifiably aligning the targeted population with the research hypotheses, I was able to accomplish the following: (a) increase the confidence that the study's research outcome was valid; (b) prevent selection bias (i.e., unintended errors in the recruitment of participants); (c) prevent information

bias (data inaccuracy); and (d) increase the generalizability of the study results to the

targeted population (Bennett et al., 2010).

Power analysis. Power analysis is a statistical method used to determine an

optimal, preliminary sample size for the purpose of ensuring a high reliability of study

results (Tomczak, Tomczak, Kleka, & Lew, 2014). Determination of the sample size via

power analysis requires specifying levels for the alpha (*a*), statistical power (1- β), and

effect size (Cohen, 1992b; Funder et al., 2014). Alpha is a statistical number between

zero and one that represents the probability of a making Type I error, that is, the

conditional probability of erroneously rejecting the null hypothesis in the sample when it

is actually true in the population (Emmert-Streib & Dehmer, 2019; Funder et al., 2014).

To decrease the probability of a Type I error, a common practice in social sciences is to

set the alpha value at .05 (Cohen, 1992b; Tomczak et al., 2014). Statistical power is the

probability of correctly rejecting the null hypothesis (Funder et al., 2014). Within the

statistical power equation (1- β), beta (β) is a number between zero and one that

represents the probability of a Type II error, that is, the probability of erroneously

accepting the null hypothesis in the sample when in fact it is false in the population

(Funder et al., 2014). A common practice in social sciences to decrease the probability of

a Type II error is to set the beta at .20, which in turn, will establish the statistical power (1

– β = 1 - .20) at .80 (Cohen, 1992b; Funder et al., 2014).

Determining an effect size requires considering various research factors. An effect

size (ES) refers to the magnitude of distance between the null hypothesis's value ($H_0 = 0$)

and the alternative hypothesis's value ($H_1 \neq 0$; Cohen, 1992b; Keskin & Aktas, 2013).

Theoretically speaking, the closer a detected effect size is to the null hypothesis of 0, the

more difficult it is to reject the null hypothesis (Cohen, 1992b). The magnitude of the

effect size also depends on other factors, such as the nature of the research questions, the

precision of the instrument, and the homogeneity of the sample (Funder et al., 2014). A

common practice in social sciences is to pair Cohen's (1988, 1992a) conventional effect

sizes of small, medium, and large with statistical significance tests (Funder et al., 2014).

Cohen's medium effect size, with a 95% confidence interval (CI), typically represents an

approximation of the "average size of observed effects" (Cohen, 1992a, p. 281; Funder et

al., 2014; Tomczak et al., 2014). The recommended percentage for CI (i.e., 95%)

provides an estimation of both the size and the precision of the effect size (Funder et al.,

2014). Overall, to determine an optimal, preliminary sample size, I set the alpha level at

.05, a statistical power of no less than .80, and a conventional effect size for a specific

statistical test (see Table 1).

Table 1

Effect Size as a Function of Statistical Test

Tests	Effect indices	Effect size				Citation
		None	Small	Medium	Large	
Logistic regression	Odds ratio test	0	1.68	3.47	6.71	Chen, Cohen, & Chen (2010)

Sample size. I used the G*Power 3.1.9.4 power analysis (Faul, Erdfelder, Buchner, & Lang, 2019) software to predetermine the sample size. This particular sample size method ensures a higher reliability of the study along with the researcher's concerns (i.e., research budget, time restraints) or by professional recommendations (Keskin & Aktas, 2013). The advantage of using the G*Power program is that it makes use of Cohen's (1988, 1992a) effect size measures (Faul, Erdfelder, Lang, & Buchner, 2007; Keskin & Aktas, 2013). Preliminary steps for using the G*power program include the selection of a power analysis and a statistical test in accord with the null hypothesis.

Given the need to identify the sample size necessary to induce meaningful outcomes, I selected the G*Power *a priori* power analysis (to compute the sample size as a function of user-specified values for alpha, statistical power, and effect size; Faul, Erdfelder, Buchner, & Lang, 2017; Funder et al., 2014). I also selected the G*Power chi-squared (χ^2) test, Goodness-of-fit, to test the null hypotheses (Faul et al., 2017). I set the input parameters at an alpha level of .05, a medium effect size of .30, and a power goal of 0.80. The calculated parameter values yielded a total minimum sample size of 143 and an actual power of 0.80. Overall, the predetermined sample size to ensure a high reliability of the study results was 143 participants.

Recruitment

I used the full IRB recruitment period (October 1, 2018 through April 30, 2019) to recruit student volunteers. In the 2018 fall semester, I made initial contact with two academic groups of students—namely, students registered in the honors program and

students listed on academic probation. I recruited participants from the honors academic group by briefly discussing the study in diverse types of honor classes. The director of the honors program also posted an online honors announcement about the study. To recruit participants for the academic probation academic group, the Interim Dean of Students attached a study flyer and invitational letter in emails addressed to students on academic probation (see Appendix C). Initial student contact through a college administrative channel served to protect the students' anonymity (vs. contacting them personally via registration) and their sense of group inclusion (i.e., handing the flyer out to all the students).

Once I determined the number of students who met the screening criteria ($n = 79$), I provided the student volunteers with the date, time, and collective place on campus to participate in the study survey (the week of December 12 through December 18, 2018). I decided to wait until the end of the semester (a week before class finals) because of the low rate of recruitment questionnaires received via email back ($n = 2$) from the students listed on academic probation. Six percent ($n = 5$) of the total number of qualifying student volunteers participated in the study. Due to the low number of student participants in the fall study and for the purpose of maximizing student participation during the spring semester of 2019, I switched the method of collecting student data.

Second semester of study. In the 2019 spring semester, I made initial contact with students primarily registered in developmental and introductory academic classes ($n = 29$ classes). The college IRB director, the college department directors, and the class

instructors pre-approved the survey method of conducting the study in-class immediately following a brief introduction of the study. If the course was online or it was not possible to conduct the study in class (due to class time restraints), the instructors sent information about the study to their students along with the study Qualtrics URL study link. The interim dean of students also sent out the study invitational letter and flyer and link to the Qualtrics study to students on academic probation. Overall, by altering the logistical part of data collection process after the fall recruitment period, the overall usability response rate was 88% ($n = 459$) in the spring of 2019 and 6% ($n = 5$) in the fall semester of 2018.

Data Collection

I used an IRB-approved online survey format of the demographic questionnaire and the RSMP survey. I also offered a paper-based format as an optional method. Researchers have confirmed that the collection of data via a computer device exhibits comparable psychometric survey properties as a paper-based format (Ravert, Gomez-Scott, & Donnellan, 2015) and favorable acceptance rates among students (K. Park, N. Park, Heo, & Gustafson, 2019). Ravert et al. (2015) examined whether data collected from undergraduate students ($N = 258$) via a web-based survey and a paper-based survey, had similar psychometric properties in the areas of acceptance rates, missing data, words per response, scale scores, and scale internal consistency. Park et al. (2019) increased the knowledge on acceptance rates by examining what factors influenced undergraduate students' willingness to participate in online surveys.

Ravert et al. (2015) found that there was a significant correlation between the web-based format and the paper-based format of a survey in psychometric properties ($r = .511$; $N = 256$), and there were no significant differences in acceptance rates between the formats ($z = -.416$). Park et al. (2019) found that there was a significant association between the online survey format and survey participation ($\beta = 0.169$, $p < .05$). The researchers highlighted the following features of the online survey format: (a) convenience: technical component of conducting an online survey, (b) appropriateness: easiness to fill out, (c) organization: efficiency of survey, and (d) the running time: brevity of time. Overall, the researchers suggested that an online-based survey is a viable alternative method to a paper-based survey.

Online survey software. I used the Qualtrics online survey software (Qualtrics, 2019) for the following reasons: (a) it is a common option in the academic community (Duke University, n.d.; Yale University, 2019), (b) it has stringent information security requirements (it is FedRAMP certified, which is the gold standard of U.S. federal security compliance; Qualtrics, 2019), and (c) it has a wide array of options while enabling direct access to survey questions (Rubin, 2019, May 21). Researchers also use Qualtrics to administer controlled online surveys to methodically study personality factors, such as motivation, to ascertain individual's beliefs and behaviors (Evans, & Mathur, 2018). Given the advantages of using the Qualtrics survey software, I recruited more than the minimum number of participants required to run a regression analysis.

Demographic questionnaire. I created the online demographic questionnaire in

accord with peer-review research and ethical guidelines and standards. Guided by the research literature, I designed the questionnaire in accord with the data's relevancy to the study variables (AAPOR, 2015; ETS, 2015) and the theoretical framing of social identities (Braun, Woodley, Richardson, & Leidner, 2012; Fernandez et al., 2016; Rankin & Garvey, 2015). If participants indicated that they had an intellectual disability during the demographic portion of the online survey, they were taken to the end of the study (without completing the online RSMP) and thanked for their time. Guided by ethical guidelines and standards, I designed the questionnaire to assure students' anonymity (AAPOR, 2015; ACPA, 2013; ETS, 2015; Harris, 2015) and to avoid any bias during the data collection process (Braun et al., 2012; Fernandez et al., 2016). Keeping in mind the prior research ethical guidelines and standards, as well as the change in research design and research hypotheses (between the 2018 fall semester and 2019 spring semester), I created three different versions of the demographic questionnaire.

10-item version. The 10-item (paper-based only) demographic questionnaire included questions tailored to the *initial* hypotheses (see Appendix E). Inclusion of the questionnaire items was in accord with (research-based) best practices for asking demographic questions (Fernandez et al., 2016) and for identifying at-risk students (Beaudoin & Kumar, 2012). The demographic questions related to students' academic background, demographic characteristics, social-economic background, and intellectual disability (see Appendix A). Items related to the study variables included the participants' gender, age, and cumulative GPA level from the prior semester: 3.75, -4.00, 3.25, - 3.74,

2.75, - 3.24, 2.25, -2.74, 2.0, -2.24, and less than 2.0. The item on intellectual disability

was essential to ask the participants as Reiss (2013) designed the RSMP for those

students without intellectual disabilities. I conducted the initial study using the 10-item

demographic questionnaire (at the designated campus test site) during the week of

December 12 through December 18, 2018.

  15-item version. The online (and optional paper-based) 15-item demographic

questionnaire included questions tailored to the revised hypotheses (see Appendix F). I

added five demographic and study variable questions to the existing 10-item

demographic questionnaire. Specifically, the demographic questions included the

following: (a) the credit-based status of students listed on academic probation (Q4): first

time and continuous, (b) the semester-based status of students in the honors program

(Q13, Q14): first time and continuous, and (c) the importance of religion or spirituality in

the students' life (Q12). The additional study variable question asked whether the

participants were on academic probation (Q15). I conducted the current study using the

15-item demographic questionnaire during the beginning of the 2019 spring semester.

  17-item version. The online (and optional paper-based) 17-item demographic

questionnaire included demographic and study variable questions tailored to the revised

hypotheses (see Appendix A). I added two questions to the existing 15-item demographic

questionnaire. Specifically, the demographic question pertained to the total amount of

credits taken (not including the current semester). The additional study variable question

pertained to the participants' cumulative GPA level. I conducted the in-class study using the 17-item demographic questionnaire throughout the 2019 spring semester.

Two-item supplemental survey. Because I changed to the 17-item version of the demographic questionnaire after data collection had begun, I asked students who participated in the 15-item online survey to complete a 2-item supplementary demographic survey in the online format (see Appendix G). I revisited the five honors classes (in April 2019) and requested that the study participants complete the 2-item supplemental survey. After conducting the online study, I merged the demographic (15-item survey plus 2-item supplemental survey) questionnaire data together and scanned for missing data. I eliminated 37 honor student cases due to missing RSMP data and kept the remaining cases ($n = 50$; 42.5%) for data analysis purposes. Altogether, I created three versions of the demographic questionnaire (and one supplemental demographic survey), which aligned with the initial hypotheses or the current study hypotheses.

Informed consent. The general invitational letter and study flyer provided in the paper and online form included the following informed consent information:

- Issues of confidentiality.

- Benefits to the students.

- Option of withdrawing.

- Introduction of the assessment instrument (RSMP), how much time it takes (15 minutes), and how it can be taken (written form).

- Introduction of the demographic questionnaire, how much time the test takes (under 5 minutes) and how it can be taken (written form).

- Provision of incentives in first semester of study (see Appendix C).

Data collection procedures and debriefing. Before the participants began completing the survey, I provided them with brief instructions on how to complete the demographic questionnaire and the RSMP test; answered any questions prior to, during, and after the study; and advised that study participation was completely voluntary. I also reviewed the consent form material (see Appendix D). Specifically, I shared information about (a) the RSMP instrument, (b) myself as the researcher of the dissertation study, (c) how to contact the overseeing IRB, and (d) how to contact me. I also obtained informed consent from participants before they began the study and informed them that the study results would be available upon request. For the initial study, I offered incentives of food and beverages after participants had completed the study. For the revised study, some of the class instructors offered the incentive of class credit if the students chose to participate in the study. I also offered entry into a raffle for a monetary gift card ($25.00 value) for students recruited via email invitation. There were no follow-up procedures, such as interviews or treatments.

Instrumentation

I used the school version of the RSMP to assess the strength of students' motivational drives. I received permission to use this instrument from the IDS Publishing Corporation (see Appendix B). The RSMP, developed by Steven Reiss (2009), is a 104-

item self-report questionnaire that measures 13 of the 16 Reiss Motivational Profile

scales. Reiss excluded three of the RMP basic desires of motivation (i.e., romance [sex],

saving, and eating) from the RSMP to avoid asking students controversial questions

about sex or money and to shorten the questionnaire's length for use with adolescents

(Reiss, 2009). The significance levels of the RSMP scales are as follows: (a) weak desire:

statistical level of -.80 or lower, (b) average desire: statistical level of -.79 to +.79, and (c)

strong desire: +.80 or higher (see Figure 1).

In the present study, the strength of the students' motivation (as indicated by the

significance levels of the RSMP scales) determined the students' psychological needs

relevant to academic achievement. Specific RSMP scales, related to the mitigating

psychosocial factors (i.e., academic self-efficacy, organization, attention to study), that

associated with first-year academic achievement are as follows:

- RSMP scale of acceptance: psychosocial factor of academic self-efficacy;

- RSMP scale of curiosity: psychosocial factor of attention to study;

- RSMP scale of order: psychosocial factor of organization; and

- RSMP scale of power: psychosocial factor of academic self-efficacy

  (Krumrei-Mancuso et al., 2013; Reiss, 2013).

Reiss School Motivation Profile

The Thirteen Basic Desires: Self-evaluation

Level of Desire

Significance:	Weak	Average	Strong
Standard Test Score	≤ -.80	-.79 – +.79	≥ +.80

Basic Desires of Motivation:

Acceptance: the need for approval / positive mindset — Acceptance

Curiosity: the need to think — Curiosity

Family: the need to spend time with family — Family

Honor: the need for moral character — Honor

Idealism: the need to improve society — Idealism

Independence: the need for personal freedom — Independence

Order: the need for structure — Order

Physical activity: the need for exercise — Physical Activity

Power: the need for self-efficacy — Power

Social contact: the need for friends — Social Contact

Status: the need for respect — Status

Tranquility: the need for safety — Tranquility

Vengeance: the need to fight back (IDS Publishing Corporation, 2017). — Vengeance

Mean Standard Score   -3   -2   -1   0   +1   +2   +3

Figure 1. Composite scores of RSMP.

There is empirical support for the RSMP as a scientific measure of motivation. Froiland et al. (2015) investigated what basic desires of school motivation were significantly associated with academic achievement among high school students, ages 16–20. The authors acknowledged the utility of using the RSMP to examine student motivation within a school setting and the validity and reliability of the instrument. Froiland et al. found that the motives of intellectual curiosity and family significantly associated with academic achievement. Regarding gender, male students had a stronger desire for intellectual curiosity and a lower desire for family than female students. Furthermore, students with a stronger desire for intellectual curiosity had a higher level of academic achievement when they had a weaker desire for physical activity. Overall,

Froiland et al. concluded that the RSMP is significantly associated with student academic achievement.

Reliability. The findings of two confirmatory factor analysis (CFA) studies supported a 15-factor RMP model of fundamental motives (Havercamp & Reiss, 2003; Reiss & Havercamp, 1998). The RMP factors include acceptance, curiosity, eating, family, honor, idealism, independence, order, physical activity, power, romance, social contact, status, tranquility, and vengeance. Acceptable instrument consistency with the Cronbach's alpha coefficients averaged between .82 (Reiss & Havercamp, 1998) and .83 (Havercamp & Reiss, 2003) across the scales. Acceptable internal consistency reliability coefficients for a personality assessment range between .70 and .90 (M = .77; Charter, 2003).

The external reliability coefficients of a 15-factor RMP model of fundamental motives also had a high test-retest instrumental consistency with the Pearson Product Moment correlations ranging between .72 to .96 (M = .83) across the scales after a two-week interval (Reiss & Havercamp, 1998) and .69 to .88 (M = .80) after a four-week interval (Havercamp & Reiss, 2003). Acceptable test-retest reliability coefficients for a personality assessment range between .70 and .90 (M = .79; Charter, 2003). Overall, prior research has shown that the internal and external reliability of the 15 factor scales of the initial RMP has an acceptable level of consistency and stability over time. The scientifically-derived evidence of a 15-factor model of fundamental motives supports the

research assumptions of fundamental motives as referring to end purposes and universal

goals.

Validity. The findings of two concurrent validity studies support a 16-factor

model of the RMP. Olson and Weber (2004) explored the relationship between

personality traits (five factor model; McCrae & John, 1992) and fundamental motives

(16-factor model; Reiss, 2004) among university students. The researchers measured the

fundamental motives using the RMP test and personality traits using the Revised

Neuroticism-Extraversion-Openness Inventory (NEO PI-R; Costa, & McCrae, 1992;

McCrae & John, 1992). The NEO PI-R scales are neuroticism, extroversion, openness to

experience, agreeableness, and consciousness (McCrae & John, 1992).

Olson and Weber (2004) found that there was a significant relationship between

the majority of the RMP scales and one or more of the NEO-PI-R scales. Seven of the

RMP motive scales were positively correlated with the NEO-PI-R scale of Neuroticism:

Savings ($r^2 = .28$, $p < .01$), Order ($r^2 = .33$, $p < .01$), Status ($r^2 = .24$, $p < .01$), Vengeance

($r^2 = .31$, $p < .01$), Eating ($r^2 = .25$, $p < .01$), Acceptance, ($r^2 = .50$, $p < .01$), and

Tranquility ($r^2 = .46$, $p < .01$). Two of the RMP motive scales were positively correlated

with the NEO-PI-R trait scale of Extroversion: Social Contact: ($r^2 = .58$, $p < .01$) and

Status ($r^2 = .19$, $p < .05$). Four of the RMP scales were positively or negatively correlated

with the NEO-PI-R scale of Openness to Experience: Social Contact ($r^2 = .20$, $p < .05$),

Curiosity ($r^2 = .46$, $p < .01$), Order ($r^2 = -.19$, $p < .01$), and Independence ($r^2 = .17$, $p <$

.01).

Additionally, seven of the RMP scales were positively or negatively correlated with the NEO-PI-R trait scale of Agreeableness: Honor (r^2 = -.18, $p < .01$), Power (r^2 = -.18, $p < .05$), Idealism (r^2 = -.30, $p < .01$), Independence (r^2 = -.29, $p < .01$), Status (r^2 = -.28, $p < .01$), Romance (r^2 = -.23, $p < .01$), and Family (r^2 = .22, $p < .01$). Four of the RMP scales were positively correlated with the NEO-PI-R scale of Consciousness: Honor (r^2 = .31, $p < .01$), (r^2 = .33, $p < .01$), Idealism (r^2 = .24, $p < .01$), and Family (r^2 = .21, $p < .05$). The researchers concluded that there was an association between fundamental motives and personality traits. Overall, the study provided concurrent validity for the 16 factor RMP model. Furthermore, the study supported the 16-basic theory's first hypothesis that the majority of the basic desires are "trait motives" (Reiss, 2004, p. 186) and the theory's first principle that the basic desires are deeply rooted in human nature (Reiss, 2013).

In a more recent concurrent validity study, Olson and Chapin (2007) examined the relationship between fundamental motives (Reiss, 2004) and psychological needs (Deci & Ryan, 1985, 200) as well as their association to well-being (McGregor & Little, 1998) and intrinsic and intrinsic motivation (Harter, 1978). The population sample was university students. The components of well-being are eudaimonic and hedonic. *Eudaimonic well-being* refers to the meaning in life in the areas of feeling of connectedness, purpose, and growth (McGregor & Little, 1998). *Hedonic well-being* refers to happiness in the areas of satisfaction with life, positive affect, and freedom from negative affect (McGregor & Little, 1998).

Psychological instruments used to assess the association between the psychological needs and fundamental motives and their relationship to well-being and intrinsic and extrinsic motivation included the following:

1. The Reiss Motivation Profile (RMP; Reiss, 2013)

2. The Basic Psychological Needs Satisfaction in General Scale (BNSG; Johnston & Finney, 2010; Kashdan, Julian, Merritt, & Uswatte, 2006; Meyer, Enstrom, Harstveit, Bowles, & Beevers, 2007)

3. The Purpose in Life Test (PILT; Crumbaugh & Henrion, 1988)

4. The Positive and Negative Affect Schedule Scale (PANAS; Watson, Clark, & Tellegen, 1988)

5. The Work Preference Inventory (WPI; Amabile, Hill, Hennessey, & Tighe, 1994).

Olson and Chapin (2007) found that there was a significant relationship between six of the RMP scales and one or more of the BNSG scales. The RMP Family scale was positively correlated with all three BNSG scales: Autonomy ($r = .28$, $p < .01$), Competence ($r = .26$, $p < .01$), and Relatedness ($r = .44$, $p < .01$). The RMP Independent scale was negatively correlated with the BNSG Relatedness scale ($r = -.30$, $p < .01$). The BNSG Relatedness scale was also correlated with two of the RMP scales, Status ($r = .25$, $p < .0$) and Social Contact ($r = 51$, $p < .01$). Additionally, the RMP Acceptance scale was negatively correlated with the BNSG Autonomy scale ($r = -.26$, $p < .01$). The RMP competence scale was positively correlated with the physical activity motive ($r = .25$, $p <$

.01) and negatively correlated with the vengeance motive ($r = -.30$, $p < .01$). The researchers concluded that there was an association between fundamental motives and psychological needs.

Olson and Chapin (2007) also found that there was a significant relationship between six of the RMP scales and the well-being measurements (PILT, PANAS). Six of the RMP scales were positively correlated with the PANAS Positive Effect scale: affect: curiosity ($r = .26$, $p < .05$), honor ($r = .20$, $p < .01$), social contact ($r = .26$, $p < .05$), family ($r = .26$, $p < .05$), status ($r = .22$, $p < .01$), physical activity ($r = .44$, $p < .05$), and acceptance ($r = -.46$, $p < .05$). Additionally, six of the RMP scales were positively or negatively correlated with the PIL (meaning in life) scale: Idealism ($r = .28$, $p < .05$), Honor ($r = .33$, $p < .05$), Social Contact ($r = .25$, $p < .05$), Family ($r = .33$, $p < .05$), Physical Activity ($r = .23$, $p < .05$), and Vengeance ($r = -.32$, $p < .05$). The researchers concluded that there was an association between fundamental motives and well-being.

Additionally, Olson and Chapin (2007) found that there was a significant relationship between six of the RMP scales and the WPI scales. Six of the RMP scales were positively or negatively correlated with the intrinsic WPI scale: Curiosity ($r = .54$, $p < .05$), Idealism ($r = .24$, $p < .05$), Power ($r = .20$, $p < .01$), Physical Activity ($r = .26$, $p < .05$), Acceptance ($r = -.21$, $p < .01$), and Tranquility ($r = -.25$, $p < .05$). The intrinsic scales include the factors of Challenge and Enjoyment (Amabile et al., 1994). Additionally, the five of the RMP scales were positively correlated with the WPI extrinsic factor scales: Acceptance ($r = .48$, $p < .05$), Status ($r = .42$, $p < .05$), Order ($r =$

.23, $p < .01$), Power ($r = .19$, $p < .01$), Eating ($r = .35$, $p < .05$), and Saving ($r = .23$, $p < .01$). The extrinsic scales include the factors of Compensation and Outward (i.e., individual concern with recognition and the directives of others; Amabile et al., 1994). The researchers concluded that there was an association between the fundamental motives, intrinsic motivation, and extrinsic motivation. Overall, the study established the concurrent validity of the 16-factor RMP model. Additionally, the study results supported the theory of the 16 desires as "end motives" (Reiss, 2004, p. 180) and Reiss's fourth hypothesis that each of basic desires produced an intrinsically different valued feeling of joy (Reiss, 2013).

Established reliability coefficients. For each of the RSMP scales, I conducted item analyses to examine the internal consistency of the scales. Established reliability coefficients (or internal reliability) for an educational and personality assessment tool range between .70 and .90 (Charter, 2003; Pallant, 2016; Taber, 2018). The reliability coefficients for the RMP range between .82 (Reiss & Havercamp, 1998) and .83 (Havercamp & Reiss, 2003) across scales. In the present study, the Cronbach's alpha averaged between .73 and .92 across scales (considered acceptable values; see Table 2).

Table 2

Item Analytics for 13 Reiss School Motivation Profile Scales

Scales	Internal consistency		
	N	α[a]	$SD(r)$[b]
Physical exercise	453	0.92	0.1
Family	449	0.92	0.1
Vengeance	451	0.88	0.14
Order	451	0.86	0.09
Acceptance	449	0.85	0.09
Social contact	449	0.84	0.11
Tranquility	451	0.82	0.09
Curiosity	451	0.81	0.09
Power	451	0.81	0.12
Status	451	0.81	0.08
Idealism	451	0.80	0.08
Honor	449	0.77	0.13
Independence	451	0.73	0.13

[a] Cronbach alpha coefficients.
[b] Standard deviation of inter-item correlations.

Operationalization

In association with the study's null hypotheses, I defined the predictor variable of motivation as basic human strivings or basic desires (Havercamp & Reiss, 2003). These basic desires make up the 13 empirically-derived factor scales of the RSMP (IDS Publishing Corporation, 2017; Reiss, 2013). I defined gender as the participants' sex assignment at birth (female or male) and age as their particular age group (18 years old, 19–24, 25–39, 40–64, or 65 or older). Furthermore, I defined the outcome variable—academic achievement—as the participants' level of cumulative GPA from the prior semester: (a) less than 2.00, (b) 2.00–2.24, (c) 2.25–3.74, (d) 2.75–3.24, (e) 3.25– 2.74, and (f) 3.75–4.00

I measured the predictor and outcome variables using descriptive statistical procedure methods. More specifically, I calculated gender, age (see Tables 4–5) and cumulative GPA data (see Tables 8–9) using both frequencies and percentages in table form (Geramian, Mashayekhi, & Ninggal, 2012). The resulting statistical scores represent the frequency rates of gender and age groups and the frequency and percent distribution of different levels of cumulative GPA. I calculated the RSMP data (see Table 10) using range, means, and standard deviation in table form (Froiland et al., 2015). The resulting statistical scores represent the RSMP standard scores on a 7-point Likert scale. Overall, I measured each of the predictor and outcome study variables using descriptive statistical procedure methods, calculating frequency, percentage, and RSMP scale scores.

Data Analysis Plan

Table 3

Data Analysis Plan for Research Questions

Research questions	Dependent variables	Independent variables	Statistical procedure
Questions 1-13	Different levels of cumulative GPA	13 RSMP factors	Bivariate ordinal logistic regression
Question 14	Different levels of cumulative GPA	Gender	Multivariate ordinal logistic regression
Question 15	Different levels of cumulative GPA	Age	Multivariate ordinal logistic regression

Software for statistical analysis. I analyzed the data using the 2019 IBM

Statistical Package software (SPSS) for Microsoft Windows. Social science researchers commonly use this statistical software when examining the relationships between a set of independent variables and one continuous variable (Ong & Puteh, 2017). Specifically, researchers use SPSS for bivariate and multivariate analysis for both nonparametric and parametric statistical techniques (Ong & Puteh, 2017). I used the SPSS descriptive statistical procedure methods to measure the predictor and outcome study variables and the SPSS inferential statistical procedure method, ordinal logistic regression, to test the null hypotheses. The significance level for all statistical analyses was set *a priori* at $\alpha <$ .05.

Research questions and hypotheses. I examined the current lines of study intent with 15 research questions that highlighted the association of Reiss basic desires of motivation with different levels of GPA, gender, and age.

RQ 1: Does the RSMP factor of social contact predict different levels of GPA?

> H_o1: The RSMP factor of social contact does not predict different levels of GPA.
>
> H_a2: The RSMP factor of social contact will predict different levels of GPA.

RQ 2: Does the RSMP factor of curiosity predict different levels of GPA?

> H_o1: The RSMP factor of curiosity does not predict different levels of GPA.
>
> H_a2: The RSMP factor of curiosity will predict different levels of GPA.

RQ 3: Does the RSMP factor of honor predict different levels of GPA?

> H_o1: The RSMP factor of honor does not predict different levels of GPA.

*H*_a2:   The RSMP factor of honor will predict different levels of GPA.

RQ 4: Does the RSMP factor of family predict different levels of GPA?

H_o1:   The RSMP factor of family does not predict different levels of GPA.

H_a2:   The RSMP factor of family will predict different levels of GPA.

RQ 5: Does the RSMP factor of independence predict different levels of GPA?

H_o1:   The RSMP factor of independence does not predict different levels of

GPA.

H_a2:   The RSMP factor of independence will predict different levels of GPA.

RQ 6: Does the RSMP factor of power predict different levels of GPA?

H_o1:   The RSMP factor of power does not predict different levels of GPA.

H_a2:   The RSMP factor of power will predict different levels of GPA.

RQ 7: Does the RSMP factor of order predict different levels of GPA?

H_o1:   The RSMP factor of order does not predict different levels of GPA.

H_a2:   The RSMP factor of order will predict different levels of GPA.

RQ 8: Does the RSMP factor of idealism predict different levels of GPA?

H_o1:   The RSMP factor of idealism does not predict different levels of GPA.

H_a2:   The RSMP factor of idealism will predict different levels of GPA.

RQ 9: Does the RSMP factor of status predict different levels of GPA?

H_o1:   The RSMP factor of status does not predict different levels of GPA.

H_a2:   The RSMP factor of status will predict different levels of GPA.

RQ 10: Does the RSMP factor of vengeance predict different levels of GPA?

H_o1:   The RSMP factor of vengeance does not predict different levels of GPA.

H_a2:   The RSMP factor of vengeance will predict different levels of GPA.

RQ 11: Does the RSMP factor of physical exercise predict different levels of GPA?

H_o1:   The RSMP factor of physical exercise does not predict different levels of
GPA.

H_a2:   The RSMP factor of physical exercise will predict different levels of GPA.

RQ 12: Does the RSMP factor of acceptance predict different levels of GPA?

H_o1:   The RSMP factor of acceptance does not predict different levels of GPA.

H_o2:   The RSMP factor of acceptance will predict different levels of GPA.

RQ 13: Does the RSMP factor of tranquility predict different levels of GPA?

H_o1:   The RSMP factor of tranquility does not predict different levels of GPA.

H_a2:   The RSMP factor of tranquility will predict different levels of GPA.

RQ 14: Do the RSMP factors and gender predict different levels of GPA?

H_o1:   The RSMP factors and gender does not predict different levels of GPA.

H_a2:   The RSMP factors and gender will predict different levels of GPA.

RQ 15: Do the RSMP factors and age predict different levels of GPA?

H_o1:   The RSMP factors and age does not predict different levels of GPA.

H_a2:   The RSMP factors and age will predict different levels of GPA.

Research Questions 1–13. The first 13 questions guiding this research study

focused on motivational factors that may predict academic achievement (i.e., cumulative

GPA) among community college students. The independent variables were the Reiss

basic desires of motivation, age, and gender. The dependent variable was cumulative

GPA. To examine the focus of the study, I conducted an analysis of the first13

hypotheses (see Chapter 3: Introduction section).

*Analysis Plan***.** To test Null Hypotheses 1–13, I used the inferential statistical

procedure of bivariate ordinal logistic regression (see Table 3). Researchers use this type

of regression to determine the relationship between the values displayed by one

independent variables and one ordinal dependent variable (Bertani, Di Paola, Russo, &

Tuzzolino, 2018). I used the bivariate ordinal logistic analysis to determine the

relationship between the values displayed by the independent variables (the Reiss 13

basic desires of motivation (and the ordinal dependent variable (cumulative GPA; Laerd

Statistics, 2018).

Research Questions 14–15. The last two research questions guiding this research

study (RQs 14–15) focused on the differences in motivational factors between gender

groups and age groups and their association with cumulative GPA. The independent

variables were the Reiss basic desires of motivation, age, and gender. The dependent

variable was different levels of cumulative GPA. To examine the additional focus of the

study, I conducted an analysis of the 14th and 15th hypotheses (see Chapter 3:

Introduction).

*Analysis Plan***.** To test Null Hypotheses 14 and 15, I used the inferential statistical

technique of multivariate ordinal logistic regression analysis. This type of regression is an

extension of the bivariate ordinal logistic regression, which researchers use to determine

the interaction between the values displayed between the values of two or more independent variables and an ordinal dependent variable (Liu, 2018). I used a multivariate ordinal logistic analysis to determine the relationship between the values displayed by one of the independent variables (Laerd Statistics, 2018): Reiss' basic desires of motivation (found to significantly associate with Cumulative GPA), gender, and age; and the ordinal dependent variable: cumulative GPA.

Interpretation of the results.

Descriptive statistics. I used SPSS descriptive statistical procedure methods to determine which of the basic desires of motivation (RSMP scales) were more salient for different levels of cumulative GPA: (a) low academic achievement: less than 2.0, (b) average: 2.0 - 2.24 and 2.25 – 3.24 and (c) above average (to excellent): 3.25 -3.74 and 3.75 – 4.0 (see Figure 2; Table 8). Each of the 13 basic desire composites comprise eight respective items. Computation of the composite scores for each basic desire involved the averaging the individual test scores across the eight respective items. Composite scores could range from -3 to 3, with high scores corresponding to strong basic desires of motivation, average scores corresponding to average motivation desires of motivation, and low scores corresponding to weak basic desires of motivation (see Figure 1).
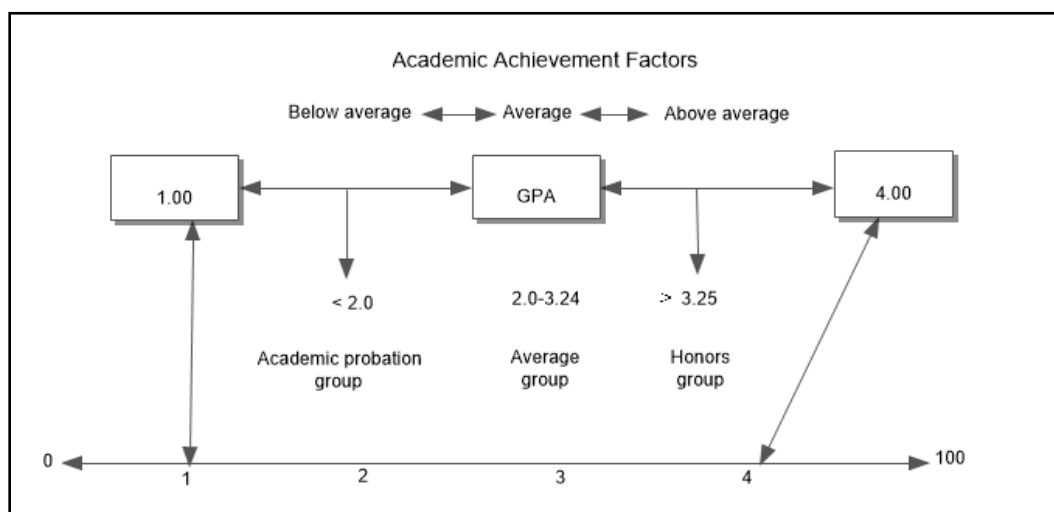
Figure 2. Academic Achievement Factors. Students at the below average academic achievement level were on academic probation following their first semester in college and had a cumulative GPA of less than 2.0. Students at the above average academic achievement level were honors students who had a cumulative GPA of at least 3.25. A South West University refers to a post-secondary institution located in the United States.

Inferential statistics. Researchers have used ordinal logistic regression to determine which academic and nonacademic variables (e.g., prior academic performance, socio-demographics, and personal characteristics) predict post-secondary academic achievement (Hodara & Lewis, n.d.; Mothilal, Broos, De Laet, & Pinxten, 2018). They have also used ordinal logistic regression to determine whether the demographic variables of age and gender predict post-secondary academic achievement (Adejumo & Adetunji, 2013; Mahmood, Murad, & Kakamad, 2018). In line with previous peer-reviewed studies, I used ordinal logistic regression to determine which of the 13 Reiss basic desires of motivation (non-academic variables) predict academic achievement at a

community college in the western United States. I also used ordinal logistic regression to determine whether key Reiss basic desires (determined in bivariate ordinal logistic regression results), among age and gender groups, predict academic achievement at the same community college.

I interpreted the ordinal logistic regression results in accord with the SPSS key parametric estimates: (a) odds ratio (OR): exponentiation of the B coefficient [EXP(B)], (b) 95% CI for EXP(B), (c) Wald chi-square with degrees of freedom: Wald χ^2 (df value), and (d) significance level: p value (Laerd Statistics, 2018; Pallant, 2016). The odds ratio conveys useful information about the effect of the predictor variables on the outcome variable (Andrade, 2015; Pallant, 2016). For each of the odds ratios, the 95% CI refers to the probable confidence that the range of (upper and low) values encompass the true value of odds ratio (Pallant, 2016). If the 95% CI for EXP (B) does not include 1.00 in the lower and upper values, the odds ratio is significant (Andrade, 2015; Pallant, 2016). The Wald χ^2 value determines the statistical significance of each of the predictor variables (Laerd Statistics, 2018; Pallant, 2016). In combination with the degrees of freedom, higher values of Wald χ^2 indicate significance (International Business Machines, 2019). I reported only the odds ratio results when the significance level was less than .05 (see Chapter 4: Results section).

Data cleaning and screening procedures. For computation of reliability purposes, the RSMP instrument has a 7-point Likert scale for each of the 104 test items. Researchers have found that the Likert scale is susceptible to response biases, including

social desirability and acquiescent responding (i.e., the tendency to select a positive

connotation; DeSimone et al., 2015). Hence, I used best practice recommendations to

screen for low-quality data. Direct techniques included self-report and instructed items;

indirect techniques included archival screening and statistical screening (DeSimone et al.,

2015). Prior to administering the RSMP test, I used the self-report technique to encourage

participants to share with me if they did not exert effort, attention, energy, or

thoughtfulness. I also used the technique of instructed items to (a) provide information on

the RSMP test items: reference to personal goals, want, and values, (b) explain what the

Likert 7-point scale responses (i.e., strength of agreement or disagreement), and (c)

discuss how to answer an inapplicable question: imagine their reaction to an event. I

instructed the participants to use the 0 or neutral ratings if they were confused by the

wording of an item, neither agree nor disagree, or no opinion. Finally, I expressed to the

participants how valuable their answers would be to the outcome of the research project.

Collectively, the direct screening techniques of self-report and instructed items provided

a means to monitor insufficient effort via self-admittance or noticeable patterns of errors

in survey scale responses.

The indirect techniques of archival screening and statistical screening also provide

a means to monitor insufficient effort. Archival screening refers to the examination of

response behaviors over the course of a survey (DeSimone et al., 2015). In order to

examine response behaviors, I tracked the time it took for the participants to complete the

survey. DeSimone et al. (2015) suggested that if students complete a survey too soon,

outside the minimum time to spend on an item (i.e., 2 seconds per item), it reflects a lack of attention and inaccurate responses. The other indirect technique, statistical screening, refers to the use of a descriptive screening procedure (i.e., mean, standard deviation, skewness, and kurtosis) to compare individual responses to item response distributions in order to ascertain whether there are any extreme response patterns (DeSimone et al., 2015). I used the IBM SPSS (2019) descriptive screening procedures (i.e., mean, standard deviation, skewness, and kurtosis) to statistically screen for any extreme response patterns. Collectively, the techniques of archival screening and statistical screening provided an indirect means to monitor insufficient effort identified via student response time or in any extreme response patterns.

Summary

In the present study, I examined the effect of the Reiss motivation factors, age, and gender on cumulative GPA. I recruited a sample of students enrolled in developmental and introductory level academic courses. As described in the sampling strategies and procedures section, I selected a sampling frame of college students at a community college in the western region of the United States. For the purpose of inducing meaningful outcomes, I used the G*Power software to predetermine the sample and effect sizes. I used convenience sampling when recruiting participants and collected data using an online survey that included the demographic questionnaire and the RSMP survey.

As part of the data analysis plan, I discussed the online demographic questionnaire and the RSMP test at the day and time set aside for the students to complete the online survey. I also reviewed the consent form, informed participants that participation was completely voluntary, and answered any questions. After completing the data collection process, I used the SPSS descriptive statistical procedure methods to measure the predictor and outcome study variables. I also used ordinal logistic regression, an inferential statistical procedure, to test the null hypotheses. To monitor insufficient student effort and to clean collected data, I applied best practices recommended for data screening including the use of direct (i.e., self-report, instructed items) and indirect (i.e., archival screening, statistical) screening techniques.

Threats to Validity

Internal, External, and Statistical Conclusion Validity

Possible threats to statistical results in a cross-sectional research study include the (a) reliability and validity of the test instrument, (b) sampling procedures, and (c) inclusion and accountability of the research question variables (Yens et al., 2014). I used a reliable and valid test instrument in my study: the RSMP (the school version of the RMP). As mentioned earlier in the dissertation, there is an body of peer-reviewed work on the RMP showing that it satisfies the scientific criteria of reliability as determined by test-retest reliability and internal consistency using Cronbach's alpha. Researchers also found that the RMP scales had high levels of both concurrent and criterion validity. Concerning the threat of sampling procedures, I took steps to include a larger number of

participants (N = 459 participants) than the pre-determined sample size established for statistical analyses. Because one of the threats to external validity is insufficient representation of the targeted population, a sufficient sample of participants is essential (Yens et al., 2014). Finally, as to the threat of inclusion and accountability of the research question variables, I made sure (as mentioned earlier in the dissertation) to select factor variables of motivation and academic achievement that researchers found to influence first-year, first-semester academic achievement. Overall, I used evidence-based recommendations to address the possible threats to the statistical results in this cross-sectional study.

Ethical Procedures

As part of the recruitment and data collection processes, I sought preliminary permission to recruit students enrolled at a western U.S. community college from the vice president of academic affairs, IRB member, and administrative directors who oversee matters related to students listed on academic probation and students enrolled in the honors program. I also sought permission to recruit students from community college instructors who teach honors courses. After approval from Walden University's IRB and the western U.S. community college's district IRB, I adhered to ethical procedures. Although I did not employ a deceptive or harmful approach that required follow-up procedures (e.g., follow up interviews), I corrected any misconceptions that participants had by encouraging the participants to share, at any time, adverse experiences they had while completing the survey. Other ethical procedures I adhered to included taking

reasonable steps to minimize the harm of research procedures by providing participants prompt and appropriate information prior to and at the conclusion of the research study (American Psychological Association, 2010). In sum, I adhered to ethical procedures prior to and during the recruitment and data collection process.

Treatment of study participants and data. To ensure both the confidentiality and anonymity of participant's data, I reviewed the confidentiality form (see Appendix D) with participants and then requested that they sign the confidentiality form prior to data collection. If the confidentiality form was reviewed in the online survey form, they clicked on the consent button prior to participating in the research study (see Appendix D). The confidentiality form informed participants that any information they provided would (a) be kept confidential, (b) not be used for any purposes outside of this research project, and (c) be de-identified in the study reports. I also explained that the online survey data (demographic questionnaire and RSMP test) would be stored on a password-protected personal computer.

For the optional paper survey data (demographic questionnaire and RSMP test), I informed participants that I would secure the data by coding the survey responses using an identification number rather than their name. I also asked them to seal the survey packet prior to submission. Furthermore, I gave participants a copy of the consent form to keep for their records. I shared that I would keep the data for a period of at least six years after completion of the study and then destroy it thereafter. Overall, I adhered to revised statues while in the process of recruiting participants and collecting data (Family

Educational Rights and Privacy Act, 1974; Revised Statutes, 2018) for the purposes of assuring student privacy (i.e., non-directory student information) and student confidentiality (i.e., student collection data).

To summarize, I addressed potential threats to the results of this cross-sectional study by (a) using the school version of a reliable and valid scientific measure, the RMP; (b) surveying a sufficient sample of participants; and (c) selecting factor variables of motivation and academic achievement found in prior peer-reviewed research studies to affect first-year academic achievement: Reiss basic desires of the RMP and semester-based cumulative GPA. I also adhered to ethical procedures prior to and during the recruitment and data collection processes.

Chapter Summary

In review of Chapter 3, I revised the initial methodology of the dissertation study as a result of the low rate of participants. The revised purpose of the study was to understand which motivational factors predict academic achievement (i.e., cumulative GPA) among community college students. An additional purpose was to determine differences in motivational factors, among gender and age groups, in predicting cumulative GPA. The independent variables were motivational factors, age, and gender. The dependent variable was cumulative GPA, ranked into six ordinal groups.

I used the convenience sampling method to recruit students. I collected data using an online survey, which included a demographic questionnaire and the RSMP survey. Prior to and during the recruitment and data collection process, I adhered to ethical

procedures. As part of the data analysis plan, I used SPSS descriptive statistical procedure methods to measure the predictor and outcome study variables and ordinal logistic regression, an inferential statistical procedure, to test the null hypotheses. To monitor insufficient student effort and to clean the collected data, I applied evidence-based best practices for data screening. In Chapter 4, I summarize the descriptive information pertaining to the participants, review the assumptions for the applied statistical methods, and report the outcomes of the statistical analyses.

Chapter 4: Presentation of the Results and Findings

Introduction

The purpose of the present quantitative study was to gain a better understanding of the motivational factors that predict academic achievement and whether the motivational factors, along with gender and age, predict student success. This information could aid community college administrators and class instructors in identifying effective strategies for improving the success of students whose motivational profiles negatively impact their GPA scores. College students could also learn how to manage motivational drives that decrease the likelihood of obtaining a college degree.

I revised the proposed research questions (see Chapter 3: Population section). This revision was necessary due to the low number of participants listed on academic of probation (see Chapter 3: Population section). Instead of using a binary dependent variable referring to academic probation group and honors group (in the original research question) as an indicator of academic achievement, I used cumulative GPA. To examine whether the RSMP factors, age, and gender predicted GPA level, I conducted an analysis related to the fifteen research questions. The first 13 research questions pertained to the individual effect of each of the RSMP scales on cumulative GPA. That is, I conducted a bivariate analysis to examine whether the 13 RSMP factors (i.e., social contact, curiosity, honor, family, independence, power, order, idealism, status, vengeance, exercise, acceptance, tranquility) predicted cumulative GPA. For the 14th research question, I conducted a multivariate analysis to examine whether the RSMP factors and gender

predicted academic achievement. Similarly, for the 15th research question, I examined

whether motivational factors and age predicted GPA.

Data Collection

In the following data collection sections, I describe the timeframe for data

collection, actual recruitment, and the response rates. I also discuss any deviations in data

collection from the plan presented in Chapter 3. In the participant characteristics section,

I describe the representativeness of the sample to the community college population and

any adverse events related to the intervention. In the results section, I review the study

findings of SPSS descriptive statistics and ordinal logistic regression.

Timeframe and Actual Recruitment

I collected data in the spring semester of 2019 between the months of March and

April. Four hundred and seventy-one participants accessed the online survey via the

Qualtrics (2019) link. Based on the power analysis for sample size described in Chapter

3, the minimal sample size required for a two-tailed regression analysis was 143. To

reach the sample size quota, I recruited participants during class time and through class

announcement postings and email. Class recruitment primarily included those students

registered in core courses (100-level) and remedial, developmental courses (090-level). I

selected these types of courses because they included the student population of interest

(young adults in their first year of college). Recruitment through class announcement

postings included students in the honors program and students registered in online

courses. The honors program director sent out a general announcement about the online

survey along with the Qualtrics URL link to the honors students. Similarly, the online

class instructors sent their students a general announcement about the online survey along

with the Qualtrics URL link.

Email recruitment included students placed on academic probation. Use of this

method was necessary to recruit the total population of students listed on academic

probation at the community college ($N = 104$). The interim dean of student affairs sent

out an invitational letter to students on academic probation with a Qualtrics survey link

and attached study flyer. Contacting the students in this administrative manner was in

adherence to the Family Educational Rights and Privacy Act (Family Educational Rights

and Privacy Act, 1974). This federal regulation protects the privacy of student

educational records (i.e., academic achievement, discipline files) as well as student

directory information (i.e., name, email address). Taking into consideration the various

recruitment methods, I attained the sample size necessary to run both two-tailed

regression analyses within the allotted recruitment period of two months.

Response Rates

Of the total 534 responses, I deemed 471 usable as a result of full completion.

Sixty-three responses were deemed unusable as a result of partial completion and survey

duplication in another class. The latter reason may be due to the instructors' inclusion of

extra credit or the participant's desire to retake the survey. Of the 471 usable cases, I

eliminated 12 cases due to missing data points and age restriction. Three participants did

not complete any of the RSMP survey questions, and nine participants marked that they

were under 18 years old. Based on the ratio of full-to-partial survey submissions, data

missingness, and age restrictions, the overall usability response rate was 88% ($n = 459$).

Participant Characteristics

Table 4 displays the frequency rates of participants' gender. Of the 459

participants who attempted to complete the survey, 41% were male and 59% were

female. In comparison, according to the 2019 spring Fast Facts institutional statistics for

the total student population, 42% of the total student population ($N = 7,275$) were male

and 56% were female. The gender breakdown of the sample population closely

represented the college population.

Table 4

*Number and Proportion of Sex at Birth Groups (*N = 459*)*

Gender	Frequency	Valid percent	Cumulative percent
Male	190	41.4	41.4
Female	269	58.6	100
Total	459	100	

Age. Table 5 displays the frequencies of the age groups. Most participants (85%)

were under 25 of age. In comparison, according to the 2015 spring 45th Day institutional

statistics on the community college, the majority (87%) of the total population ($N = $

8.684) were under 25 years of age. The sample population, according to age, was within

the age range of the college population.

Table 5

*Number and Proportion of Age Groups (*N *= 459)*

Age group	F	%	Cumulative %
18	113	24.6	24.6
19 – 24	277	60.3	85
25 – 39	47	10.2	95.2
40 – 64	20	4.4	99.6
65 or older	2	0.4	100
Total	459	100	

Ethnicity. Table 6 displays the frequencies of each ethnicity. The majority (59%) of the participants identified as White. A little over a quarter (27%) identified as Hispanic and 10% identified as Black. In comparison, according to the 2018 spring *45th Day* institutional statistics for the community college, out of the total student population ($N = 7,486$), the majority of the students identified as White (57%). Almost a quarter (22%) identified as Hispanic, and 3% identified as Black (see Table 6). The 2019 spring *Fast Facts* institutional statistics on the community college also indicated that the majority of the total student population ($N = 7, 275$) identified as White (58%), nearly a quarter (24%) identified as Hispanic, and a smaller number (7%) identified as Black. The sample population, according to ethnicity, closely represented the college population.

Table 6

*Number and Proportion of Ethnicity Groups (*N *= 459)*

Race/Ethnic	Sample population		Total population	
	N	%	*n*	%
White	271	59	4,289	59%
Hispanic	123	27	1,644	23%
Black	45	10	258	4%
Asian	19	4	263	4%
American Indian	13	3	90	1%
Hawaiian / Pacific Islander	3	1	8	0%
Two or more races	13	3	189	3%
Other	4	1	745	10%

Note. Groups in the 2019 Spring Sample Population (*N* = 459) and in the 2019 Spring 45th Day Population (*N* = 7,275) at the Central Arizona Community College.

Academic class standing. In addition to the institutional information on student gender, age, and ethnicity, Table 7 displays the frequencies of academic class standing. The majority (65%) of the participants were in their first year of college as either first-time students (i.e., first semester; no prior enrollment at college or university) or as continuous students (i.e., two semesters or more). In accord with the 2019 spring *Fast Facts* institutional statistics on the community college, close to three quarters (72%) of the total student population (*N* = 7, 275) were in their first year of college as either first-time students or as continuous students with limited college experience. The sample population, according to academic class standing, closely represented the college population.

Table 7

Contingency Table of Academic Class Standing by Academic Year at a Western U.S. Community College (N=459)

Academic Class Standing	Academic year (current)						
	1st year	2nd year	3rd year	> 3rd year	Other / unknown	High school[1]	Total
1st semester	57	0	0	0	0	0	57
2nd semester or more	242	0	0	0	0	0	242
Second-year student	0	126	0	0	0	0	126
Other	2	0	12	8	11	1	34
Total	301	126	12	8	11	1	459

[1] High school students were continuing or dual enrolled students

Summary. The sample was similar to the total population of students enrolled in a community college in the Western region of the United States. The majority of the sample was within the age group between 18 and 24. Additionally, the majority of the total populations were first-year students with little or no college experience. Because I recruited students who fit the sociodemographic profile of the college population in the spring of 2019, research inferences can be made about the student population (Banerjee & Chaudhury, 2010).

Adverse Events

During data collection, no participants reported instances of psychological harm or adverse events. While showing the class presentation on the purpose of the study, several of the participants gave positive comments about (a) the international college completion rate among young adults, (b) the White House's 2020 college completion goal, and (c) how the 13 Reiss motivation factors personally related to their academic

success. Additionally, several of the students commented on the that it didn't take long to complete the online survey, expressed curiosity about the PhD dissertation process, and conveyed good wishes for the completion of my dissertation.

Results

The results section includes information on (a) the descriptive statistics of the dependent and independent variables, (b) statistical procedures and associated assumptions applicable to the study, and (c) data analysis results organized by significant research questions. As to the descriptive statistics, I review the findings related to cumulative GPA, the RSMP scales, gender, and age. As to the data analysis results for the first 13 research questions, I used the statistical procedure of bivariate ordinal logistic regression. For Research Questions 14 and 15, I used the statistical procedure of multivariate ordinal logistic regression.

Descriptive Statistics

Table 8 displays the frequency and percent distribution of cumulative GPA. The majority (57%) of the participants had an above-average cumulative GPA in the previous semester (3.25 to 4.0). A 2017 annual report from the community college also indicated that the majority (80%) of the participants ($N = 8,684$) had an above-average cumulative GPA (3.0 to 4.0) in the 2015 fall semester. Additionally, a 2019 annual report from the community college indicated that, across the three-year period of 2015–2018, the percentage of grade distribution per semester was above average (3.68 to 3.76). The

sample appears to represent the total population in average grade distribution of 3.25 or

higher.

Table 8

*Frequency and Percent Distribution of Cumulative GPA at a Western U.S. Community College (*N =446)

Cumulative GPA	F	Valid %	Cumulative %
Less than 2.0	17	3.8	3.8
2.0 - 2,24	19	4.3	8.1
2.25 -2.74	32	7.2	15.3
2.75 – 3.24	124	27.8	43.1
3.25 – 3.74	139	31.2	74.3
3.75 – 4.0	115	25.8	100
Total	446[a]	100	

Note: Students were asked her cumulative GPA prior to the current semester
a Missing cases = 13

To assure adequate cell count (i.e., no zero values in a factor space noted in SPSS

output results) while running the SPSS ordinal logistic regression, I truncated the two

lower GPA levels: 2.00–2.24 and less than 2.00 (see Table 9).

Table 9

*Frequency and Percent Distribution of Truncated Cumulative GPA at a Western U.S. Community College (*N =*446)*

Cumulative GPA	*f*	Valid %	Cumulative %
< 2.25	36	8.1	8.1
2.25 - 2.74	32	7.2	15.2
2.75 - 3.24	124	27.8	43.0
3.25 - 3.74	139	31.2	74.2
3.75 - 4.00	115	25.8	100.0
Total	446[a]	100	

Note: Students were asked her cumulative GPA prior to the current semester
a Missing cases = 13

RSMP scales. Table 10 displays the descriptive statistics for each of the RSMP scales. The RSMP standard scores ranged on a Likert scale between -3 and +3. The RSMP scale score results, on average, ranged between -.66 and 1.58. The median scale scores ranged from -.63 to +1.63. According to Reiss (2009), the significance levels of the RSMP scales indicate the strength (weak, average, or strong) of a basic desire. Reiss wrote that these basic desires are drives that motivate all humans. Scale scores below -.80 indicate a weak desire, scores between -.79 and .79 indicate an average or moderate desire, and scores greater than .80 indicate a strong desire. Table 11 shows that none of the means of the scale scores fell into the lower range of desire. Eight of the scales had an average score that fell in the moderate range of desire, and five of the scales had an average score that fell into the higher range of strong desire. Together, the RSMP scales indicated that over half (62%) of the study participants had strong motivational drives

related to idealism, order, family, and curiosity.

As shown in Table 10, the kurtosis values were between -0.08 and 1.04. The skewness values were between -0.04 and 0.24. For sample sizes greater than 300, researchers can determine deviations from normal distributions by examining the absolute values of kurtosis and skewness. Distributions with skewness values greater than 2 and kurtosis values greater than 4 are considered to have non-normal distributions (Mishra et al., 2019). For continuous data, the testing of normality is essential for determining the selection of parametric and nonparametric tests (Mishra et al., 2019). As shown in Table 10, the sample size was larger than 300 ($N = 449$–451), and none of the scales had distributional values greater than the absolute values. Hence, the continuous data (scale scores for the 13 RSMP scales) had a normal distribution and is suitable for applying proposed correlation and regression parametric procedures.

Table 10

Descriptive Statistics for 13 Reiss School Motivation Profile Scales

Scale	N	M	SD	Min	Mdn	Max	Kurtosis (*SE* = 0.23)	Skewness (*SE* = 11)
							Descriptive statistics	Distribution
Vengeance	451	-0.66	1.2	-3	-0.63	3	-0.55	0.24
Independence	451	-0.1	0.94	-2.38	-0.13	3	-0.08	0.15
Tranquility	451	-0.08	1.19	-3	0	2.88	-0.34	-0.04
Status	451	-0.03	1.1	-3	0	3	-0.36	-0.07
Power	451	0.1	1.02	-3	0.13	3	-0.27	-0.12
Acceptance	449	0.49	1.17	-3	0.5	3	-0.46	-0.22
Social contact	449	0.69	1.09	-2.63	0.75	3	-0.25	-0.34
Physical exercise	453	0.7	1.4	-3	0.75	3	-0.61	-0.29
Idealism	451	0.86	0.92	-3	0.88	2.88	1.04	-0.66
Order	451	1.07	1.03	-2.25	1.13	3	-0.3	-0.31
Honor	449	1.17	0.84	-1.63	1.13	3	-0.32	-0.23
Family	449	1.53	1.14	-3	1.75	3	0.89	-1.01
Curiosity	451	1.58	0.81	-0.75	1.63	3	-0.38	-0.43

Gender and age. Tables 5 and 6 show the frequency and percent distributions for gender and age. The majority of the students were female (59%) and between ages of 19 and 24 years old (60%). About a quarter of them were 18 years old.

Bivariate Ordinal Logistic Regression

To examine the results for the first 13 research questions, I computed bivariate ordinal logistic regression models. A bivariate regression is a type of ordinal logistic

analysis used to examine the association of a relationship between two study variables (Bertani et al., 2018). As a member of the family of regression analyses in SPSS, the ordinal logistic analysis determines (a) whether the independent predictor variable(s) has a statistically significant effect on a dependent outcome variable, and (b) how well an ordinal logistic regression model predicts the dependent variable (Laerd Statistics, 2018). Prior to running the analysis, I examined the data to ensure there were no violations of its assumptions. The procedure assumptions relate to the study design and how well the data fit the ordinal regression models. After examination of the study variables, I found that the study data met all of the relevant assumptions.

Assumptions. The first assumption of bivariate ordinal logistic regression is that the dependent variable is measurable at the ordinal level (Laerd Statistics, 2018). The dependent variable in my study was cumulative GPA, truncated into five ordinal groups: (a) less than 2.25, (b) 2.25 - 2.74, (c) 2.75 - 3.24, (d) 3.25 - 3.74, and (e) 3.75 - 4.00. The second assumption is that one or more of the independent variables is continuous or categorical (Laerd Statistics, 2018). The independent variables RSMP factors were continuous. The other independent variables gender and age (i.e., 18, 19-24, 25 – 39, 40 – 64, 65 or older), were nominal and ordinal variables, respectively. Thus, the data met the first and second assumptions of bivariate ordinal logistic regression.

The third assumption is that there should be proportional odds in that each of the independent variables should have an identical effect at each cumulative split of the dependent variable (Laerd Statistics, 2018). One of the methods to test this assumption is

to run a full likelihood ratio test (i.e., test of parallel lines) using SPSS statistics (Laerd

Statistics, 2018). The SPSS procedure compares the fit of the proportional odds model to

a model with varying location parameters (Laerd Statistics, 2018). If the data meets the

proportional odds assumption, the difference in model fit (i.e., chi-square scores) between

these two models should be small and insignificant ($p > .05$; Laerd Statistics, 2018). If

the data does not meet the assumption of proportional odds, the difference in fit between

the models should be large and significant ($p < .05$; Laerd Statistics, 2018). The full

likelihood ratio test results may also flag a violation of proportional odds that does not

exist (Laerd Statistics, 2018). To further examine whether the data violated this

assumption, I ran separate binomial logistic regressions on the cumulative, dichotomous

dependent variable (Laerd Statistics, 2018).

Table 11

Test of Parallel Lines for 15 Bivariate Ordinal Logistic Regression Models

	Models														
	Age (M1)	Sex (M2)	Vengeance (M3)	Order (M4)	Honor (M5)	Status (M6)	Curiosity (M7)	Physical Exercise (M8)	Acceptance (M9)	Idealism (M10)	Tranquility (M11)	Social Contact (M12)	Power (M13)	Family (M14)	Independence (M15)
χ^2	2.16	2.5	2.51	2.5	3.03	1.05	3.22	3.29	0.59	1.08	7.84	6.07	1.09	1.37	1.4
df	6	4	3	3	3	3	3	3	3	3	3	3	3	3	3
p	0.9	0.64	0.47	0.48	0.39	.79	0.36	0.35	0.9	0.78	0.05	0.11	0.78	0.71	0.7

To test the assumption of proportional odds, I conducted a test of parallel lines on

16 bivariate ordinal models (see Table 11). The results indicated that the data met the

assumption of proportional odds for fifteen of the bivariate ordinal logistic regression

models. However, the chi-square test result for the 11th model of Tranquility appeared to

be sensitive to the sample size (χ^2 ($df = 3$) = 7.84, $p = .05$). To further examine whether

the data violate this assumption, I ran a separate binomial logistic regression on the

cumulative, dichotomous dependent variable of Cumulative GPA to determine whether

the odds ratios were different. The results indicated that the odds ratios ranged from 0.86

to 1.14, suggesting a possible violation of the proportional odds ratio assumption. Rather

than cautiously interpreting the results from the ordinal logistic odds model, I conducted

a binomial logistic regression to determine the effect of tranquility on cumulative GPA.

Tranquility did not have an effect on cumulative GPA (see Table 12).

The fourth assumption is that there is no occurrence of multicollinearity (i.e., a

high inter-correlation among two or more independent variables; Laerd Statistics, 2018).

Because I conducted bivariate logistic regressions with only one independent variable per

model, this assumption was not relevant.

Table 12

Results for Binary Logistic Regression Models for Tranquility on Binomial Cumulative GPA Categories

GPA binomial category	Log odds				Odds ratio		
	B	*SE*	*p*	Constant	Exp(B)	95% CIs	
						Lower	Upper
> 2.24	-0.01	0.15	.97	2.41	0.99	0.746	1.325
> 2.74	0.13	0.11	.24	1.71	1.14	0.915	1.417
> 3.24	-0.10	0.08	.24	0.25	0.91	0.775	1.066
> 3.74	-0.15	0.09	.11	-1.07	0.86	0.721	1.036

The fifth assumption is that there is an adequate cell size of the data set prior to assessing the overall goodness of fit of the ordinal logistic regression model (Garson, 2014; Laerd Statistics, 2018). SPSS assists in understanding whether there is an adequate cell count through the chi-squared test. This specific test compares the expected cell count frequencies with the observed cell count frequency. A rule of thumb is that the expected frequency in each cell should be large; that is, 80% or more of the cells should be greater than 5 and that no cell in the factor space should be 0 (Garson, 2014; McCormick & Salcedo, 2017). If cell adequacy is not met, SPSS Statistics generates a warning in the procedural outcome. Conducting bivariate ordinal regressions with covariates (i.e., independent continuous variables) tends to generate a SPSS statistic warning message stating that an inflated proportion of cells with an expected count less than 5 (Garson, 2014). To further investigate whether there was a violation of cell adequacy, a crosstabulation (not part of the ordinal logistical regression) is run in

Descriptive Statistics that provides information about cell adequacy in the factor table (Garson, 2014).

Prior to examining the bivariate ordinal logistic regressions, I checked for cell adequacy. I treated each of the independent ordinal variables (age, gender) as a "nominal variable" and transferred them into the Factor(s) box. I treated each of the independent ordinal variables (13 RSMP factors) as a "continuous variable" and transferred it into the Covariate(s) box (Laerd Statistics, 2018, Procedure II: Running the Plum Procedure section). I transferred the dependent ordinal variable (continuous GPA) into the Dependent box. The resulting outcome generated warning messages. Since the warning sign pertains to a factor space not missing values in the covariate space (Garson, 2014), I ran a crosstabulation through SPSS Descriptive statistics to show the factor space table. Before running the crosstabulation, I treated each of the independent ordinal variables (age, gender) as a nominal variable and transferred them into the Roll (factor) box. I transferred the dependent ordinal variable (cumulative GPA) into the Column box. The outcome report generated no warnings; hence, the fifth assumption was met.

Overall fit of the model. To interpret the overall fit of the ordinal regression model, SPSS Statistics provides the following measures: likelihood-ratio test, goodness-of-fit tests, and pseudo-R^2 measures. The likelihood-ratio test (i.e., Model Fit - Chi-Square measurement) reflects the change in model fit between the full model and the intercept-only model (Laerd Statistics, 2018; Menard, 2010). The goodness-of-fit tests (i.e., Pearson's Chi-Square, Deviance Chi-Square measurements) provide an overall

measure of whether the model fits the data well (Laerd Statistics, 2018; Menard, 2010).

The pseudo-R^2 measures (i.e., Nagelkerke, McFadden) attempt to assess the predictive

capacity of the model as used in least-squares linear regression (Smith & McKenna,

2013).

In recent peer-reviewed articles, researchers have cautioned the use of common

pseudo-R^2 measures for interpreting the overall fit of the ordinal regression model. They

noted the following reasons for caution: (a) the influence of study design characteristics

on pseudo-R^2 estimates (Hemmert, Schons, Wieseke, & Schimmelpfennig, 2018), (b)

limited guidelines for interpretation (Smith & McKenna, 2013), and (c) the resulting

lower values across common pseudo-R^2 squares measures when compared to values of

ordinary least squares found under similar conditions (Smith & McKenna, 2013). For

example, Hemmert et al. (2018) investigated the fundamental differences of seven

distinct pseudo-R^2 measures and their dependence on basic study design characteristics.

The meta-analysis included 274 published logistic regression models and 24 simulation

scenarios varying in sample size ($N =150$, 500, or 1000).

The results of Hemmert et al.'s (2018) study indicated that almost all pseudo-R^2

squares measures were influenced by sample size, number of predictor variables, number

of dependent variable categories, and its distribution asymmetry. Furthermore, the values

of the different pseudo-R^2 measures varied significantly. When comparing different

regression models on the study data, the pseudo-R^2 measures were directly affected by

the number of independent variables in the model. Recommendations included the

rejection of the use of McFadden's benchmark values for sample sizes larger than 200.

Current research, SPSS statistical tutorials, and statistical guides on logistic

regression cite additional reasons for the cautionary use of pseudo-R^2 square measures.

These reasons included the notion that the measures are: (a) not a good criterion (Akin &

Şenturk, 2012; Bozpolat, 2016; Laerd Statistics, 2018), (b) not universally valued (Laerd

Statistics, 2018), (c) lead to confusing interpretations and unclear reporting (Hemmert et

al., 208), and (d) inconclusive in peer-review literature (Osborne, 2015). When pseudo-R^2

measures are low, researchers interpreted the overall fit of the ordinal regression model

using the likelihood-ratio test and goodness-of-fit tests (Akin & Şenturk, 2012; Bozpolat,

2016). Guided by recent research and updated SPSS statistical tutorials, I used the

likelihood-ratio test and goodness-of-fit tests to interpret the overall fit of the ordinal

regression models. This aligns with Coe's (2002) recommendation to use reliable,

universally accepted measures to determine the strength of a relationship between two

variables.

Results. I conducted a series of bivariate ordinal logistic regressions to determine

whether the RSMP factors, age, and gender predicted different cumulative GPA level (as

noted in the 15 research questions). Table 13 displays the significant results.

Table 13

Bivariate Ordinal Logistic Regression Model Coefficients

	Age (M1)		Sex (M2)	Vengeance (M3)	Order (M4)	Honor (M5)	Status (M6)	Curiosity (M7)
	18 yrs	19-24 yrs						
Parameter Estimates								
Estimate	-0.32	-0.75	-.45	-0.31	0.23	0.27	-0.21	0.28
Standard Error	0.28	0.25	0.17	0.07	0.08	0.10	0.08	0.11
p value	.25	.003	.01	.00	.01	.01	.01	.01
Model Fitting Info.								
Model Fit - Chi-Square	11.16		6.72	18.40	7.28	6.32	6.70	6.63
Df (C-S)	2.00		1.00	1.00	1.00	1.00	1.00	1.00
p (C-S)	.004		.01	.05	.01	.01	.01	.01
Goodness-of-Fit								
Pearson's Chi-Square	2.09		1.32	171.01	172.71	179.35	197.44	131.01
Df (P CS)	6.00		3.00	183.00	163.00	135.00	187.00	127.00
p (P CS)	.91		.72	.73	.29	.01	.29	.39
Deviance Chi-Square	2.16		1.32	171.41	181.24	188.19	176.32	138.53
Df (D CS)	6.00		3.00	183.00	163.00	135.00	187.00	127.00
p (D CS)	.91		.73	.72	.16	.00	.70	.23
Test of Parallel Lines								
Chi-Square (parallel)	2.16		1.32	2.51	2.46	3.03	1.05	3.22
df (paralle1)	6.00		3.00	3.00	3.00	3.00	3.00	3.00
p (parallel)	.90		.73	.47	.48	.39	.79	.36

Table 13

Bivariate Ordinal Logistic Regression Model Coefficients (Cont.)

		Physical Exercise (M8)	Acceptance (M9)	Idealism (M10)	Tranquility (M11)	Status (12)	Power (M13)	Family (M14)	Independence (M15)
Parameter Estimates									
	Estimate	-0.14	0.09	0.07	-0.08	-0.06	-0.06	0.02	-0.07
	Standard Error	0.06	0.07	0.09	0.07	0.08	0.08	0.08	0.09
	p value	.02	.22	.47	.30	.46	.50	.81	.46
Model Fitting Info.									
	Model Fit - Chi-Square	5.37	1.52	0.49	1.08	0.55	0.45	0.06	0.54
	Df (C-S)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	p (C-S)	.02	.22	.48	.30	.46	.50	.81	.46
Goodness-of-Fit									
	Pearson's Chi-Square	233.39	193.37	157.76	216.73	180.07	166.56	164.55	157.97
	Df (P CS)	203.00	187.00	167.00	179.00	167.00	175.00	171.00	167.00
	p (P CS)	.07	.36	.68	.03	.23	.66	.62	.68
	Deviance Chi-Square	246.44	200.37	163.91	216.83	183.52	178.41	168.36	161.92
	Df (D CS)	203.00	187.00	167.00	179.00	167.00	175.00	171.00	167.00
	p (D CS)	.02	.24	.55	.03	.18	.41	.54	.60
Test of Parallel Lines									
	Chi-Square (parallel)	3.29	0.59	1.08	7.84	6.07	1.09	1.37	1.07
	df (parallel)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	p (parallel)	.35	.90	.78	.05	.11	.78	.71	.79

   Research Question 2. The null hypothesis for RQ 2 stated that the RSMP factor

of curiosity would not predict different levels of GPA. Given the ordinal logistic

regression results, I rejected the null hypothesis. Increases in participants' need for

curiosity was modestly associated with increases in the odds of GPA, with an odds ratio

of 1.32, 95% CI [1.073 to 1.627], Wald χ^2 (1) = 6.86, $p < .01$. Moreover, the model was

consistent with the observed data, Pearson χ^2 = 131.02, $p = .39$; Deviance χ^2 = 138.53, $p =$

.23. The results suggested that students with a strong desire for intellectual understanding

were likely to have a higher GPA than those with a weaker desire for deep thinking.

   Research Question 3. The null hypothesis for RQ 3 stated that the RSMP factor

of honor would not predict different levels of GPA. Given the ordinal logistic regression

results, I rejected the null hypothesis. An increase in participants' need for honor or

integrity was modestly associated with an increase in the odds of GPA, with an odds ratio

of 1.30, 95% CI [1.064to 1.304], Wald χ^2 (1) = 6.51, $p <.01$. The results suggested that

students with a strong desire for an upright character were likely to have a higher GPA

than those with a weaker desire for integrity. However, the model was not consistent with

the observed data, Pearson χ^2 = 179.35, $p < .05$; deviance χ^2 = 188.19, $p < .01$.

   Research Question 7. The null hypothesis for RQ 7 stated that the RSMP factor

of order would not predict different levels of GPA. Given the ordinal logistic regression

results, I rejected the null hypothesis. An increase in participants' need for order was

modestly associated with an increase in the odds of GPA, with an odds ratio of 1.26, 95%

CI [1.064 to 1.481], Wald χ^2 (1) = 7.24, $p < .01$. Moreover, the model was consistent with

the observed data, Pearson $\chi^2 = 172.71$, $p = .29$; deviance $\chi^2 = 181.24$, $p = .16$. The results

suggested that students with a strong desire for organization were likely to have a higher

GPA than those with a weaker desire for organization.

   Research Question 9. The null hypothesis for RQ 9 stated that the RSMP factor

of status would not predict different levels of GPA. Given the ordinal logistic regression

results, I rejected the null hypothesis. An increase in participants' need for social status

was modestly associated with a decrease in the odds of GPA, with an odds ratio of 0.81,

95% CI [0.697 to 0.948], Wald χ^2 (1) = 6.99, $p < .01$. Moreover, the model was consistent

with the observed data, Pearson $\chi^2 = 197.44$, $p = .29$; deviance $\chi^2 = 176.32$, $p = .70$. The

results suggested that students with a strong desire for respect based on social standing

were likely to have a lower GPA than those with a weaker desire for status.

   Research Question 10. The null hypothesis for RQ 10 stated that the RSMP

factor of vengeance would not predict different levels of GPA. Given the ordinal logistic

regression results, I rejected the null hypothesis. An increase in participants' need for

vengeance was modestly associated with a decrease in the odds of GPA, with an odds

ratio of 0.74, 95% CI [0.636 to 0.848], Wald χ^2 (1) = 17.77, $p <.00$. Moreover, the model

was consistent with the observed data, Pearson $\chi^2 = 171.01$, $p = .73$; deviance $\chi^2 = 171.41$,

$p = .72$. The results suggested that students with a strong desire to confront those who

offend were likely to have lower GPAs than those with a weaker desire for confrontation.

   Research Question 11. The null hypothesis for RQ 11 stated that the RSMP

factor of physical exercise would not predict different levels of GPA. Given the ordinal

logistic regression results, I rejected the null hypothesis. A decrease in participants' need for physical exercise was modestly associated with a decrease in the odds of GPA, with a odds ratio of 0.87, 95% CI [0.77 to 0.981), Wald χ^2 ($df = 1$) = 5.18, $p < .02$. The results suggested that students with a strong desire for physical exercise were less likely to have a higher GPA than those with a weaker desire for physical activity. However, the model may not be consistent with the observed data, Pearson $\chi^2 = 233.39$, $p = .07$; deviance $\chi^2 = 246.44$, $p < .05$.

Conclusion. The results of the bivariate ordinal logistical regression indicated that, among the RSMP scales, six of the variables (curiosity, honor, order, status, vengeance, and physical exercise) were significantly associated with cumulative GPA with a small effect size. Moreover, according to the goodness-of-fit indices, four of the RSMP scales (curiosity, order, status, and vengeance) were consistent with the observed data. To determine the effects of the RSMP scales (significant at the bivariate level), gender, and age on cumulative GPA, I conducted a series of multivariate ordinal logistic regressions with proportional odds.

Multivariate Ordinal Logistic Regression

To examine the results for Research Questions 14 and 15, I computed multivariate ordinal logistic regression models. Multivariate logistic regression analysis is an extension of the bivariate ordinal logistic regression in which two or more independent variables are taken into consideration simultaneously to predict the ordinal (dichotomized) dependent variable (Liu, 2018). The multivariate ordinal logistic

regression in the present study included the demographic variables of gender and age, as well as six of the RSMP independent variables (curiosity, honor, order, status, vengeance, and physical exercise) found to significantly associate with cumulative GPA. Prior to running the analysis, I examined the data to ensure there were no violations of its assumptions. The procedure assumptions relate to the study design and how well the data fit the ordinal regression models. After examination of the study variables, I determined that the study data met all of the relevant assumptions.

Assumptions. Multivariate ordinal logistic regression includes the same five assumptions previously described for bivariate ordinal logistic regression. The first two assumptions were met as follows: (a) the dependent variable, cumulative GPA, was measured at the ordinal level, (b) age and gender were treated as categorical, and (c) the 13 RMSP scales were treated as continuous. To test the third assumption of multicollinearity, I conducted a SPSS collinearity diagnostic test. The results indicated that both the tolerance and variance inflation factor (VIF) values were well within the acceptable range (see Table 14).

Table 14

Multicollinearity Assumption Test on Independent Variables

Independent variables	Collinearity statistics	
	Tolerance	VIF
19–24 years	0.443	2.256
Gender	0.821	1.219
Curiosity	0.673	1.485
Honor	0.567	1.764
Order	0.699	1.431
Status	0.582	1.718
Vengeance	0.71	1.408
Physical exercise	0.682	1.466

Note: a. Dependent variable: Cumulative GPA
Tolerance values greater than 0.1 and variance inflation factor (VIF) value of 10 indicates there were no violations of multi-collinearity.

To test the fourth assumption of proportional odds, I conducted a parallel test for the two sets of multivariate ordinal logistic regressions. The results indicated that the assumption of proportional odds was met because the difference in model fit between these two models was small and insignificant (see Table 15).

Table 15

Test of Parallel Lines for Multivariate Ordinal Logistic Regression Models

	Models			
	Female (R.Q. 14)		With age (R.Q. 15)	
	Model 16 (7 I.V.s)	Model 17 (5 I.V.s)	Model 18 (7 I.V.s)	Model 19 (5 I.V.s)
χ^2	18.63	13.89	19.69	13.32
df	21	15	24	18
p	.61	.53	.71	.77

To test the fifth assumption, I conducted a series of multivariate ordinal logistic regressions. Based on recent research and up-to-date SPSS statistical tutorials, I used the likelihood-ratio test and goodness-of-fit tests to interpret the overall fit of the ordinal regression models (for additional information please see the dissertation section: *Overall fit of the bivariate ordinal regression model*). Prior to examining the multivariate ordinal logistic regressions, I checked for cell adequacy. I treated the independent ordinal variables (age, gender) as nominal variables and transferred them into the Factor(s) table. I treated the five independent ordinal variables (RSMP factors; curiosity, honor, order, status, and vengeance) as continuous variables and transferred them into the Covariate(s) table. I also transferred the dependent ordinal variable (continuous GPA) into the Dependent box. The resulting outcome generated warning messages for the bivariate ordinal logistic regressions ran with a (covariate) RSMP factor.

Because the warning sign pertained to the factor space and not missing values in the covariate space (Garson, 2014), I ran a crosstabulation through SPSS Descriptive Statistics. Before conducting the crosstabulation, I treated the independent ordinal variables (age, gender) as nominal variables and transferred them into the Roll (factor table) box. I also transferred the dependent ordinal variable (cumulative GPA) into the Column box. The outcome report generated no warnings; hence, the fifth assumption was met. Overall, all the relevant assumptions of the multivariate ordinal logistic regression were met.

Overall fit of the model. Based on current research and updated SPSS statistical tutorials on ordinal logistic regression, I used the likelihood-ratio test and goodness-of-fit tests to interpret the overall fit of the multivariate ordinal regression models. For further information, please see (Bivariate ordinal logistic section: Assumptions: Overall fit of the model).

Results. I conducted a set of multivariate ordinal logistic regressions with proportional odds to determine the effect of the RSMP scales (that were significant at the bivariate level), gender, and age on cumulative GPA. Table 16 provides the results for the regression models. Model 16 shows the effect of gender and RSMP scales on cumulative GPA. Model 17 shows the effect of age and RSMP scales on cumulative GPA.

Table 16

Bivariate and Multivariate Ordinal Logistic Regression Model Coefficients

	Bivariate Model 1-15		Multivariate Models			
			With Female		With Age	
			Model 16		Model 17	
	B	*SE*	*B*	*SE*	*B*	*SE*
Female	-.45*	.17	-.27	.19	N/A	N/A
Age (18 yrs)	-.32	.28	N/A	N/A	-0.08	0.30
Age (19 to 24 yrs)	-.75**	.25	N/A	N/A	-.49	.26
Vengeance	-.31**	.07	-.22**	.08	-.23**	.08
Order	.23**	.08	.21*	.1	.26**	.1
Honor	.27*	.1	.13	.13	.08	.13
Status	-.21**	.08	-.11	.09	-.11	.09
Curiosity	.28**	.11	.22	.12	.2	.12
Physical Exercise	-.14*	.28	-.16*	.07	-.16*	.07
Model Fit - χ^2			4.71		44.47	
df (C-S)			7		8	
p (C-S)			0.001		0.001	
Pearson's χ^2			1741.21		1729.51	
df (P CS)			1733		1732	
p (P CS)			0.44		0.51	
Deviance χ^2			1237.6		1233.84	
df (D CS)			1733		1732	
p (D CS)			1		1	
Nagelkerke R^2_{Pseudo}			0.09		0.1	
McFadden R^2_{pseudo}			0.03		0.04	

*$p < .05$ (2-tailed), **$p < .01$ (2-tailed), ***$p < .001$

N / A: not applicable, i.e., model does not include these variables.

Research Question 14. The null hypothesis for RQ 14 stated that gender and RSMP

factors would not predict different levels of GPA. According to the full likelihood ratio

tests (test of parallel lines), the proportional odds for Model 16 was χ^2 (*df* = 21) = 18.63,

p = .61.

As a precursor for conducting the multivariate analysis, I examined the bivariate relationships between gender and academic achievement. The odds for females on cumulative GPA were less than the odds for males (odds ratio of 0.64, 95% CI [0.454 to 0.898), Wald χ^2 ($df = 1$) = 6.67, $p < .01$). This model was consistent with the observed data (Pearson χ^2 = 1.32, $p = .72$; deviance χ^2 = 1.32, $p = .73$). The results suggested that males were likely to have a higher cumulative GPAs than females.

Given the multivariate ordinal logistic regression results, I partially rejected the null hypothesis for Research Question 14 (see Table 16). With Model 16, I examined the effects of gender and RSMP scales (that were significant at the bivariate level) on cumulative GPA. The model fit significantly predicted over and above the intercept-only model, χ^2 ($df = 7$) = 4.71, $p < .001$. Moreover, the deviance goodness-of-fit test indicated that the model was a good fit to the observed data, χ^2 ($df = 1733$) = 1237.60, $p = 1.0$.

The results suggested that odds of females were similar to that of males (odds ratio of .85, 95% CI [0.75, 0.97], Wald χ^2 (1) = 2.13, $p = .145$. However, there was a modest, yet significant relationship between GPA and three RMSP scales (vengeance, order, and physical exercise). Order was positively related to cumulative GPA. An increase in participants' need for order was associated with an increase in the odds of cumulative GPA (odds ratio of 1.23, 95% CI [1.01 to 1.49], Wald χ^2 (1) = 4.30, $p < .04$). The results suggested that students with a strong desire for structure were likely to have a higher GPA than those with a weaker desire for organization.

Vengeance and physical exercise were inversely related to cumulative GPA. An

increase in participants' need for vengeance was modestly associated with a decrease in the odds of cumulative GPA (odds ratio of .81, 95% CI [0.69 to 0.95], Wald χ^2 (1) = 7.02, $p < .01$). The results suggested that students who had a strong desire to confront those who offend were likely to have a lower cumulative GPA than those with a weaker desire for confrontation. An increase in participants' need for physical exercise was associated with a decrease in the odds of GPA (odds ratio of 0.85, 95% CI [0.75 to 0.97], Wald χ^2 (1) = 5.46, $p < .02$). The results suggest that students with a strong desire for physical activity are likely to have a lower cumulative GPA than those with a weaker desire for exercise.

Overall, the results of the multivariate ordinal logistic regression partially supported the alternative hypothesis for RQ 14. The results indicated that there was a modest, yet significant relationship between cumulative GPA and three RMSP scales (vengeance, order, and physical exercise) but not between GPA and gender.

Research Question 15. The null hypothesis for RQ 15 stated that age and RSMP factors would not predict different levels of GPA. According to the full likelihood ratio tests, the proportional odds for Model 17 was χ^2 (*df* =24) = 19.69, $p = .71$.

As a precursor for conducting the multivariate analysis, I examined the bivariate relationships between age and academic achievement. The odds of 18-year-old students on cumulative GPA was similar to the odds for students older than 24 (odds ratio of 0.72, 95% CI [0.416 to 1.26] Wald χ^2 1.304, $p = .25$). The odds for students between 19 and 24 years were lower than older students (odds ratio of 0.474, 95% CI [0.291 to 0.772], Wald

χ^2 ($df = 1$) = 11.16, $p < .004$). Moreover, the model was consistent with the observed data (Pearson χ^2 = 2.09, $p = .91$; deviance χ^2 = 2.16, $p = .91$).The results suggested that students 25 years or older were likely to have a higher cumulative GPA than students between 19 and 24 years.

Given the multivariate ordinal logistic regression results, I partially rejected the null hypothesis for Research Question 15 (see Table 16). With Model 17, I examined the effect of age and RSMP scales (that were significant at the bivariate level) on cumulative GPA. The model fit was significantly greater over and above the intercept-only model (χ^2 ($df = 8$) = 44.47, $p < .001$). Additionally, the deviance goodness-of-fit test indicated that the model was a good fit to the observed data, χ^2 ($df = 1732$) = 1233.84, $p = 1.0$.

The results indicated that the odds of 18 year old students (odds ratio of 0.92, 95% CI [0.514 to 1.646], Wald χ^2 (1) = 0.08, $p = 0.78$) and 19 to 24 year old students (odds ratio of 0.62, 95% CI [0.37 to 1.025], Wald χ^2 (1) = 3.48, $p = .06$) were similar to students 25 years and older (see Table 16). However, there was a modest, yet significant relationship between cumulative GPA and three of the RMSP scales (vengeance, order, and physical exercise).

Order was positively related with cumulative GPA. An increase in participants' need for order was modestly associated with an increase in the odds of cumulative GPA (odds ratio of 1.30, 95% CI [1.073 to 1.561], Wald χ^2 (1) = 7.29, $p < .01$). The results suggest that students with a strong desire for structure are likely to have higher cumulative GPAs than those with a weaker desire for organization.

Vengeance and physical exercise were inversely related to cumulative GPA. An increase in participants' need for vengeance was modestly associated with a decrease in the odds of cumulative GPA (odds ratio of .80, 95% CI [0.679 to 0.935], Wald χ^2 (1) = 7.75, $p < .01$). The results suggest that students with a strong desire to confront those who offend were likely to have a higher GPA than those with a weaker desire for combative behavior. Moreover, an increase in participants' need for physical exercise was modestly associated with a decrease in the odds of cumulative GPA, with an odds ratio of .86, 95% CI [0.75 to 0.977], Wald χ^2 (1) = 5.31, $p < .02$). The results suggest that students with a strong desire for physical activity are likely to have a lower cumulative GPA than those with a weaker desire for exercise.

Conclusion. Given the results of the multivariate ordinal logistic regression, I partially rejected the null hypothesis for Research Question 15. The results indicated that there was a modest, yet significant relationship between cumulative GPA and three of the RMSP scales (vengeance, order, and physical exercise) but not between cumulative GPA and age.

Chapter Summary

I conducted an online survey with 459 participants to investigate which of the Reiss basic desires of motivation predicted cumulative GPA among students enrolled at a community college. An additional purpose of the study was to determine which of the motivational factors, among gender and age groups, predicted cumulative GPA. I used

SPSS ordinal logistic regression to determine the bivariate relationship between the study variables.

The sample was similar to the total population of students enrolled in a community college in the western region of the United States. Across demographic groups, the majority was representative of both genders and represented the age group between 18 and 24. The descriptive statistics indicated the majority of the sample was first-year students with little or no college experience. Over half of the participants had an above-average cumulative GPA between 3.25 and 4.00 in previous semesters. Because I recruited students who fit the current sociodemographic profile of the college population, research inferences can be made about the student population.

The independent variables in the proposed study were Reiss motivational factors, age, and gender. The motivation factors referred to the 13 empirically-derived factor scales of the standardized school measurement tool derived from the RSMP. The qualifying age groups included the following: 18, 19 to 24, 25 to 39, 40 to 64, and 65 years or older. The dependent variable was cumulative GPA, ranked into six ordinal groups: (a) less than 2.0, (b) 2.0 - 2.24, (c) 2.25 -3.74, (d) 2.75 – 3.24, (e) 3.25 - 2.74, and (f) 3.75 - 4.00.

The bivariate ordinal logistic regression results indicated that six of the RSMP variables (curiosity, honor, order, status, vengeance, and physical exercise) had a modest, yet significant association with cumulative GPA. Moreover, four of the RSMP scales (curiosity, order, status, and vengeance) were consistent with the observed data,

according to the goodness-of-fit indices. Among the demographic variables, age (19 -

24), and gender (males) had a modest, yet significant association with cumulative GPA.

The multivariate ordinal logistic regression results indicated that there was not a

significant relationship between cumulative GPA, gender, and age. However, there was a

modest, yet significant relationship between cumulative GPA and three of the RMSP

scales (vengeance, order, and physical exercise). In Chapter 5, I discuss the

interpretations, limitations, recommendations, and implications of the study results.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In Chapter 5, I summarize the purpose, key findings, interpretations, limitations, recommendations, and implications of the study results. In the interpretation section, I describe how the study results confirm and extend the findings in the peer-reviewed literature on motivation and academic achievement. In the limitation section, I explain the study weaknesses related to the validity, reliability, and generalization of the study findings. In the recommendation section, I offer suggestions for future research on the influence of motivation on academic achievement. In the study implication section, I describe how the study findings can impact positive social change and ways to implement that change.

Study Purpose

The purpose of the quantitative cross-sectional study was to better understand which of the Reiss (2013) basic desires of motivation predict undergraduate academic achievement. An additional purpose was to determine which basic desires of motivation, among gender and age groups, predict cumulative GPA. Taking into consideration research on motivation as a predictor of academic achievement, researchers have suggested further investigation into what type of intrinsic motivational factors account for different levels of GPA scores among undergraduate students (Campbell & Fuqua, 2008; Gershenfeld et al., 2015). I designed this dissertation study to fill this research gap.

Key Findings

The bivariate ordinal logistic regression results indicated a modest, yet significant relationship between four of the Reiss motivation factors (curiosity, order, status, and vengeance) and cumulative GPA. A modest relationship, as reported in peer-reviewed research articles (Di Lorenzo et al., 2014; Fitzpatrick & Burns, 2019; Glanville et al., 2020; Wen & Yeh, 2014), refers to a small or low-level effect or a weak association when the odds-ratio is less than 1.5, but not equal to 1.0 (Chen, et. al., 2010). As the values of odds ratio move away from 1.0, the relationship becomes stronger (Cohen, 1992a; Salgado, 2018). Hence, interpretation of the results should be cautious. The results suggest that students with a higher need (or desire) for curiosity and order (organization) are likely to have a higher cumulative GPA than students with a lower desire. Conversely, students with a high desire for social status and vengeance are likely to have a lower cumulative GPA than those with a weaker desire.

When I examined age or gender with the aforementioned variables, three of the RSMP scales—but not gender or age—had a modest, yet significant relationship with academic achievement. The results suggest that students with a strong desire for organization are likely to have a higher cumulative GPAs than those with a weaker desire. Furthermore, those with a strong desire for vengeance and physical exercise are likely to have a lower cumulative GPAs than those with a higher desire. Overall, the results indicated a modest relationship between cumulative GPA and the RSMP factors of order, status, and vengeance but not between cumulative GPA and gender or age.

Interpretation of the Findings

I interpreted the study results in relation to literature on motivation and academic achievement. Use of the comparison approach (vs. conventional effect size tables) is in accord with current research guidelines (Bakker et al., 2019) and recommendations (Orhan-Ozen, 2017; Schäfer, & Schwarz, 2019). For example, Schäfer and Schwarz (2019) examined (across subdivisions in psychology) the difference in effect sizes noted in prior publications without pre-registration ($N = 900$) and those with pre-registration ($N = 90$). Pre-registration is an unbiased approach of publishing studies based on the merits of its manuscript before data collection (i.e., exclusion of results and discussion sections).

The results indicated that the median effect size in publications without pre-registration was much larger (medium value of $r = 0.36$; Cohen, 1990) than publications with pre-registration (small value of $r = 0.16$; Cohen, 1990). The researchers suggested that the large discrepancy in effect sizes was likely due to publication bias or questionable research practices. Their results also indicated that there were large differences in the mean effect sizes between psychological sub-disciplines and study designs; hence, conventional (effect-size) benchmarks were not applicable. The researchers concluded that the actual effect sizes in psychological research are "probably much smaller" (Schäfer and Schwarz, 2019, p. 11) than they appear in publications. Furthermore, they recommended that the effect size be expressed in unstandardized form and derived from similar categories within the psychological sub-discipline. In accord

with Schäfer and Schwarz's recommendation, I compare the dissertation results in the next section with prior literature on the effect of motivation on academic achievement.

Small Effect of Motivation on Academic Achievement

In a recent meta-analysis, Orhan-Ozen (2017) examined the effect size of motivation on academic achievement in 205 studies published between 2010 and 2015. Moderator variables included the publication year and type, the country (culture), school subject, and sample groups. The results indicated a low-level ($r = .27$) positive relationship between motivation and academic achievement. Additionally, Orhan-Ozen found that all the moderator variables significantly affected the effect size of motivation on academic achievement.

Orhan-Ozen (2017) concluded that, although there was a low-level effect of motivation on academic achievement, the results supported prior literature findings that there is a relationship between motivation and academic achievement and that motivation plays an important role in academic achievement. Based on the researcher's conclusion, it appears that, although there was a modest (i.e., odds ratio of 1.1 to 1.5) effect of motivation on academic achievement in the dissertation study, the results support the empirically-accepted argument in literature that motivation plays an important role on academic achievement (Gharghani, Gharghani, & Hayat, 2019; Muwonge, Schiefele, Ssenyonga, & Kibedi, 2019; Vanslambrouck, Zhu1, Pynoo, Lombaerts, & Tondeur, 2017). Hence, in the next section, I explore the dissertation results with Chapter 2

literature and other research associated with the effect of motivation on academic achievement.

Small Effect of Reiss Motivation on Academic Achievement

In this study section, I review the study results in light of the existing literature on the relationship between motivational drives and academic achievement. I interpret the study results in the context of existing literature on Reiss's (2009) six motivational reasons for low academic achievement theory. Furthermore, I review the study results in accord with current literature on the relationship between gender, age, and academic achievement. The purpose of interpreting the results in relationship to literature findings is to extend knowledge in the disciplines of psychology and education.

Curiosity.

Research literature. The dissertation results suggested that students with a strong desire for intellectual understanding were likely to have a higher GPA than those with a lower desire for deep thinking. This result aligns with prior research. In Chapter 2, I noted that Kavanaugh and Reiss (2003) determined that a portion of low-achieving students in their study (N = 49) had a weak desire for intellectual pursuits. The standard test scores indicated that 39% of the students scored at least 0.8 standard deviations (SD) below the RSMP norm for curiosity, whereas only 8% scored at least 0.8 SD above the RSMP norm for curiosity (see Figure 1 in Appendix H). Additionally, Froiland et al. (2015) found a modest (r = 0.14), positive relationship between intellectual curiosity and academic achievement among high school students aged 16–20. However, in a structural

equation, curiosity was moderately positively associated with two other RSMP scales, (honor and idealism). Froiland concluded that students with a desire to learn and think deeply are typically ethical and value being of assistance to others.

     Theoretical framework. In Reiss's additional theory (noted in Chapter 2) of the six motivation reasons for low academic achievement, Reiss (2009) hypothesized that students with a low score on the RSMP scale of curiosity are low achievers because they have a weak desire for deep thinking (or low need for cognition). Personality traits that are likely evident include students as being practical or hands-on learners, and action-orientated (Reiss, 2013). In contrast, students with high scores on the RSMP scale of curiosity are high achievers because they have a strong desire for intellectual pursuits (or a high need for cognition) that provide satiation for "stimulus novelty" (Reiss, 2013, p. 52). The results of the present study support Reiss's (2009) theory as the results suggested that students with a low desire for curiosity decrease their odds for academic achievement.

     Order.

     Research literature. The study results suggested that students with a strong desire for structure were likely to have a higher cumulative GPA than those with a weaker desire for organization. This result is in line with the prior research referenced in Chapter 2. Kavanaugh and Reiss (2003) determined that a portion of low-achieving students had a weak desire to be organized. The standard test scores indicated that 27% of the low-achieving high school students scored at least 0.8 *SD* below the RSMP norm for order,

and none scored at least 0.8 *SD* above the RSMP norm for order (see Figure 1; Appendix H). Other researchers found that the degree to which students were motivated to design, organize, adjust, or persevere in a schedule determined their level of academic performance (Muwonge et al., 2019; Stover et al., 2014).

Theoretical framework. In his six motivation reasons for low academic achievement theory, Reiss (2009) hypothesized that students with a low score on the RSMP scale of order are low achievers because they have a low desire for organization. Personality traits that are likely evident include students as being spontaneous, disorganized, dislikes planning, and tardy (Reiss, 2013). In contrast, students with a stronger basic desire for order tend to be organized; punctual; and attentive to details, rule, and schedules (Reiss, 2009). The dissertation study corroborates Reiss's theory that students with a weak desire for order decrease their odds for academic achievement.

Status.

Research literature. The dissertation results suggested that students with a strong desire for respect, based on social standing, were likely to have a lower GPA than those with a weaker desire for status. This conclusion aligns with other findings in the literature that the degree to which students were impacted by their family's social status (i.e., educational and vocational degrees, occupational status; annual family net income) determined their level of academic performance (Steinmayr, Dinger, & Spinath, 2012; Wang & Finch, 2018).

Vengeance.

Research literature. The study results suggest that students who have a strong desire to confront those who offend are likely to have lower a GPA than those with a weak desire for combative behavior. This result aligns with prior research. Kavanaugh and Reiss's (2003) determined that a portion of low-achieving students had a strong desire for vengeance. The standard test scores indicated that 55% of the underachieving high school students scored at least 0.8 *SD* above the RSMP norm for vengeance, and 6% scored at least 0.8 *SD* below the RSMP norm for vengeance (see Appendix H). In a longitudinal study, Thomas (2019) examined research literature from 2006–2016 on college student peer aggression and its application for post-secondary educational institutions. The researcher found a gap in the literature related to the effect of aggression on students' motivation towards academic achievement. The present study added new knowledge to address this particular gap in research.

Theoretical framework. In the six motivation reasons for low academic achievement theory, Reiss (2009) hypothesized that students with a high score on the RSMP scale of vengeance are low achievers because they have a predisposition toward confrontation. Personality traits that are likely evident include students as being competitor, fighter, argumentative, and aggressive (Reiss, 2013). In contrast, Reiss suggested that students with a low score on the RSMP scale of vengeance have a predisposition to avoid conflict (Reiss, 2009). The results of the present study support Reiss's (2009) theory because these results suggest that students with a strong desire for vengeance decrease their odds for academic achievement.

Gender and age.

Research literature. When I examined age or gender with the aforementioned Reiss motivation variables (i.e., curiosity, order, status, vengeance), neither gender nor age had a relationship with academic achievement. The results suggested that students with a strong desire for organization are likely to have a higher cumulative GPA than those with a weaker desire for structure. Furthermore, students with a strong desire for vengeance and physical exercise are likely to have a lower cumulative GPA than those with a weaker desire for confrontation or psychical activity.

Motivation and gender. Pedaste et al. (2015) examined whether there were gender-related differences in the association of cognition ability, motivation, gender, and academic performance among first-year college students. The results indicated that all the study variables except gender were significantly associated with academic performance. In a more recent study, Gharghani et al. (2019) examined the relationships between learning strategies, motivational beliefs, and gender on academic achievement among college students. The results indicated that all the study variables except gender predicted academic performance.

Motivation and age. In a qualitative study, Srisermbhok (2017) investigated the impacting factors for learning achievement and failures (course grade) among undergraduate college students. The results indicated that both attitude and motivation (but not age) affected learning achievement and failure. In a quantitative study, Vanslambrouck et al. (2017) examined the relationship between learner characteristics,

motivation, age group, and expected performance among college students. The results indicated that all the study variables except age group were significantly correlated with expected performance.

Conclusion. Overall, the results of the present study align with researchers who showed a significant association between motivation and academic performance, but not gender or age.

Summary

To interpret the modest size of the study results, I first explored the differences of effect sizes in literature across subdivisions in psychology and of motivation on academic achievement. The odds ratio effect sizes were small; however, they appear to fall within the normal range in accord with research across subdivisions in psychology and in the area of interest: the effect of motivation on academic achievement. Although there was a modest effect size, the study results support the empirical argument in the literature that motivation plays an important role in academic achievement (Orhan-Ozen, 2017).

<div align="center">

Limitations and Recommendations for Future Research

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Interpretation of the dissertation results should be taken with caution because of its small effect size (Odds ratio of 1.1 to1.5). The results should also be taken with caution due to a number of study limitations (Connelly, 2013; Queiros, Faria, & Almeida, 2017). In Chapter 1, I described potential study limitations related to data collection and data analysis. They included the study design (the nature of self-reporting) and methodology weaknesses (confounder variables and statistical outliers). I also explained

reasonable measures taken to assure accurate and non-biased self-reporting in the pursuit

of acquiring trustworthy results. In the current chapter, I describe other limitations related

to the generalization, validity, and reliability of the study findings. I also discuss how the

limitations may have affected the results and identify clear directions for future research.

Validity

The internal validity of the study results was limited to the research design.

Because I collected data at one point in time (as a cross-sectional study), I was not able to

sufficiently establish a cause-and-effect relationship between the study variables (Setia,

2016; Yens et al., 2014). However, the research outcome inferences can generalize to the

current community college population because the sample size was large ($N = 459$) and

the participants fit the current sociodemographic profile of the college (Rezigalla, 2020;

Setia, 2016). Additionally, the cross-sectional design may be valid because the Reiss

(2004, 2012, 2013) motivation factors are thought to be genetic traits and thus stable over

time (Kesmodel, 2018). Future recommendations include conducting a follow-up

retrospective cohort study (or longitudinal study) using the same community college

population, to detect any differences and trends in the study over time (Kesmodel, 2018;

Rezigalla, 2020; Sedgwick, 2014).

Reliability

The reliability of the study results was limited due to the survey mode. I used the

Qualtrics software company's (Qualtrics, 2019) online survey software to maximize

student participation because web-based surveys have favorable acceptance rates among

students (Park et al., 2019). Insufficient effort to complete the survey (Huang, Liu, & Bowling, 2015) or inattentiveness to the survey questions (Silber, Danner, & Rammstedt, 2019) could deflate the strength of the observed relationships between the study variables in the sample. However, to assure sufficient effort and attentiveness, I used the best data screening practices during the recruitment process (DeSimone et al., 2015), as described in Chapter 1. Future recommendations include the use of attention checks via the use of "trap questions," such as "Please select the response option 'agree' for this question." If a participant fails to click the requested response, it may provide an indication of inattentiveness to the question and perhaps the entire survey (Alvarez, Atkeson, Levin, & Li, 2019; Gummer, Robmann, & Silber, 2018; Silber et al., 2019).

Another limitation was that I collected cumulative GPA data through an ordered questionnaire item using unequal size ranges. Although it is not unusual in educational research to use categorical GPA when examining the relationship between motivation and academic achievement (e.g., Caskie, Sutton, & Eckhardt, 2014; Remali, Ghazali, Kamaruddin, & Kee, 2013), categorical variables are not as reliable as continuous variables. Variables measured with categorical response options are less informative and precise than those measured continuously. When reliability is lowered, the likelihood of detecting an effect is lowered. Future recommendations include asking the participants to indicate their actual cumulative GPA from the previous semester (Caskie et al., 2014). Ideally, another recommendation is to use the participants' official transcripts for a more reliable measurement of semester GPA (Rosen, Porter, & Rogers, 2017). Researchers

found that participants who misreport on a survey tend to either inflate their score (Rosen et al., 2017) or are not able to recall their actual GPA. Accuracy of GPA is dependent on recall ability within a timeframe (Tourangeau, 2018).

Generalization

The study location and delimitation limited the generalization (external validity) of the study results. I designed the study to primarily recruit study participants from introductory academic courses. I also conducted the study at one community college in the western United States. The majority of the community college participants were first-year students, had little or no college experience, and had an above-average cumulative GPA. Given these study boundaries, the research outcome does not provide external evidence of a causal link to other study locations and student subgroups (Burell, & Gross, 2018; Ercikan & Roth, 2014; Wade 2108). However, I sought generalization by integrating evidence of multiple studies on the influence of motivation on academic achievement (see Chapter 2) that included other subgroups of students in different educational settings (Ercikan & Roth, 2014; Wang, 2018). Future recommendations include repeating the study with other participants in other educational settings (Price & Murnan, 2004) as well as conducting a qualitative study (Burell, & Gross, 2018; Ercikan & Roth, 2014). These recommendations may identify invariants in the dissertation study that continue to hold across a range of applicable situations and subgroups.

Summary

I described the boundaries of the study and explained the implication of the study limitations. I also identified clear directions for future. Possible study limitations included the following: (a) the nature of the cross-sectional study design (i.e., inability to establish a cause-and-effect relationship between study variables), (b) insufficient effort or inattentiveness during online survey completion: inflated strength of observed relationship between study variables, (c) use of one community college location: results do not generalize to other educational institutions, and (d) collected data from participants in introductory courses: results do not generalize to other student subgroups. Future recommendations include short-range possibilities for researchers to enhance the validity, reliability, and generalization of the study findings.

Implications

The results indicated a modest but significant association between Reiss basic desires of motivation (curiosity, order, status, vengeance) and academic achievement. The odds ratio effect sizes were small; however, the study's low-level effect size appears to be within the normal range (based on recent meta-analyses and research studies) across psychology subdivisions (Bosco, Aguinis, Singh, Field, & Pierce, 2015; Schäfer & Schwarz, 2019) on the area of interest: the effect of motivation on academic achievement (Almalki, 2019; Iyer, 2017; Orhan-Ozen, 2017). The following section describes the potential impact of the study for positive social change that does not exceed the study boundaries.

Positive Social Change

One of the potential contributions of the study for positive social change is that it may assist low-achieving college students learn how best to manage particular behaviors and personality traits that put them at risk for completing a college degree. That is, at-risk students can learn to avoid too much satisfaction of weak or strong motivational drives in a manner that leads to academic success throughout their educational experience (Allen & Robbins, 2010; Mengel, 2014; Robbins et al., 2009). For example, students with lower than average motivational drive for order could learn how best to manage disorganized and careless behaviors and spontaneous personality tendencies. Students with lower than average motivational drive for intellectual understanding could learn how best to manage frustration and boredom in traditional college curricula that requires deep or sustained thinking (Reiss, 2009, 2013).Underachieving students with a higher than average motivational drive for vengeance could also learn how best to manage defensive combative behaviors (Mengel, 2014; Reiss, 2013). Students with higher than average motivational drive for social status could also learn how best to manage the impact of their social- economic status on their belief and capability to achieve academic success (Steinmayr et al., 2012; Wang & Finch, 2018). College counselors could assess the motivational reasons for low student academic achievement using the RMP as part of the assessment batteries to evaluate students.

Recent statistics show a substantial decline in United States' international ranking in completing at least an associate degree since 1990 (Fry, 2017; Nettles, 2017; OECD,

2016). Insights from this study may aid educators in targeting effective strategies for improving the success of students whose motivational profiles negatively affect their GPA scores (Reiss, 2013). Furthermore, the contributions of the study may lead to the identification of first-year community college students in need of extra assistance or more challenging academic pursuits because their motivation profiles are indicative or suggestive of either low or high academic achievement. School psychologists may also benefit from using the RMP as a resourceful, scalable, repeatable, and measurable means to fully understand the relationship between undergraduates' motives and poor academic achievement (Reiss, 2004, 2009, 2012).

Summary

Due to the modest effect size of the dissertation study, caution should be heeded on the study's potential impact for positive social change at the individual and organizational levels. Recommendations for future work include conducting a deeper investigation (i.e., qualitative study; study replication) into the effect of the Reiss motivation factors on cumulative GPA in a similar sample (i.e., community college students aged of 19–24 taking introductory academic classes).

<div align="center">Conclusions</div>

The purpose of this quantitative cross-sectional study was to better understand which of the Reiss (2013) basic desires of motivation predict undergraduate academic achievement and to determine which basic desires of motivation, among gender and age groups, predicted cumulative GPA. The bivariate ordinal logistic regression results

indicated a modest relationship between the RSMP factors scales (curiosity, order, status, and vengeance) and cumulative GPA. The multivariate ordinal logistic regression results indicated a modest, yet significant relationship between the Reiss motivation factors (order, vengeance, and physical exercise) and cumulative GPA, but not between gender, age, and cumulative GPA. Because the effect size was small, the results should be taken with caution. This study contributes to the existing literature on the effect of motivation on collegiate academic achievement. Replication of the dissertation study may inform academic administrators on how to use motivational factors to identify students who may need academic assistance or more challenging tasks.

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Appendix A

17-Item Demographic Questionnaire

Name:

_____

Email:

_____

Optional Phone Number

Participant Demographic Information: _____
Self Report

Inclusivity and Functionality of Demographic Questions

The survey will include questionnaire items about your academic and personal identity. These items were designed in accord with current research on intentional rationale (i.e., timey trends) and on social identities (American College Personnel Association, 2013; Gender Identity in the U.S. Surveillance, 2014).

Demographic Questions

The following questionnaire items related to your identity and background will be kept confidential, anonymous, and in a secured environment.

1. Academic Class Standing
   □ First year
   □ First-time student: 1st semester
   □ Continuing student: 2nd semester or more
   □ Second-year student

   □ Other, please specify: _____

2. How long have you attended _____?
   □ Currently in my 1st semester
   □ Currently in my 2nd semester
   □ Other, please describe: _____

3. Enrollment Status for Last Semester (Fall)
   □ Full time: Equal to 12 credits or more
   □ ¾ time: 9–11 credits
   □ Half time: 6–8 credits
   □ Less than half time: Less than 6 credits

□ Continuing education: Non-credit classes

□ Not currently enrolled

4. Is your current enrollment status limited to one of the following?

□ 12 credit hours

□ 6 credit hours or less

□ Unknown

5. Race / Ethnicity (Select all that apply)

□ African American / Black

□ American Indian / Alaska Native

□ Asian American

□ Caucasian / White

□ Hispanic / Latino

□ Native Hawaiian / Pacific Islander

□ Other, please describe: _____

6. Sex Assignment at Birth

□ Male

□ Female

7. Gender Identity (Select all that apply)

□ Male

□ Woman

□ Trans male / Trans man

□ Trans female / Trans woman

□ Genderqueer / Gender non-conforming

□ Other, please describe: _____

8. Age

□ 17 or under

□ 18

□ 19–24

□ 25–39

□ 40–64

□ 65 or older

9. Disability / Impairment

□ No

□ Prefer not to answer

□ Yes: Please indicate the terms that best describes the condition(s) you experience

□ Free response: _____

10. Current Employment Status
  □ Full time
  □ Part time
  □ No

11. Religion, Spiritual Practice, or Existential Worldview
  □ Agnostic
  □ Atheist
  □ Baptist
  □ Buddhist
  □ Catholic
  □ Christian
  □ Hindu
  □ Jewish
  □ Muslim
  □ Latter Day Saints / Mormon
  □ Lutheran
  □ Muslim
  □ Pagan
  □ Presbyterian
  □ Quaker
  □ Taoist
  □ Unitarian Universalist
  □ No Identity
  □ Other; please specify: _____

12. How important is religion or spiritual practice in your life?
  □ Very important
  □ Somewhat important
  □ Not too important
  □ Not at all important

13. If you are a Presidents' Honors Scholarship recipient, what (current) semester are you in
  □ First semester
  □ Second semester
  □ Third semester
  □ Fourth semester
  □ Does not apply to me

14. If you are an Honors Achievement Award recipient, how many semesters have you been Program?

□ 1-2 semesters
□ 3-4 semesters
□ More than 4 semesters
□ Does not apply to me

15. Are you currently on Academic Probation?
□ Yes
□ No

16. Not including current semester, approximately how many credits have you taken?
□ 0 -12
□ 12-34
□ 37 - 48
□ 49-60
□ More than 60

17. Not including current semester, approximately what is your cumulative grade point average?
□ 3.75 – 4.00
□ 3.25 – 3.74
□ 2.75 – 3.24
□ 2.25 – 3.74
□ 2.0 – 2.24
□ Less than 2.0

Appendix B

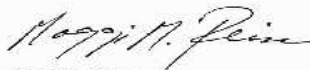Permission from RSMP Developer

IDS

December 14, 2016

Sandra Beasley
15707 West Cimarron Drive
Surprise, AZ 85374

Dear Sandra,

This letter is to confirm that you have permission to use the Reiss School Motivation Profile® in your doctoral dissertation entitled, "Multifaceted Motivational Factors on Academic Achievement."

I appreciate your interest in Professor Steven Reiss's work on intrinsic motivation, and I wish you success as you finish your dissertation research.

Sincerely,

Maggi M. Reiss
President, IDS Publishing Corporation

IDS Publishing Corporation
P.O. Box 389   Worthington, OH 43085

Appendix C

Study Flyer and Invitational Letter

STUDENT VOLUNTEERS NEEDED

For a

Study Investigating

The Multifaceted Motivational Factors
On Academic Achievement

Motivation

to Graduation

Looking for students who:

- Are first-time to college students,

- Between the ages of 18 and 24, and

- Registered in an academic achievement class

Participation is completely voluntary and confidential. You may withdraw at any time.
Food (i.e., pizza, vegetable tray, soda pop) and a monetary gift of $5.00 will be provided

Time to complete the demographic questionnaire is approx. 5 minutes. Time to complete the assessment instrument is approx. 15 minutes.

Interested individuals please contact Sandra Beasley for more information

Appendix D

Consent Form

You are invited to take part in a research study of "The Relationship of Multifaceted Motivational Factors on Academic Achievement." The researcher is inviting first time, first year, students on academic probation and honor students, between the ages of 18 and 24, to be in the study. This study is being conducted by a researcher named Sandra Beasley who is a doctoral student at Walden University.

Background Information: The purpose of this study is to increase the knowledge in the field of clinical and educational psychology on what motivational factors are associated with above-average academic performance and below-average academic performance among first-year students. An additional purpose of the study is to determine the differences in the two motivational profiles associated with both above-average and below-average academic performances. Academic performance, in both purpose statements, refers to semester GPA in the first year of college.

Here are some sample questions in the survey:
1) I enjoy meeting new people

2) I have a "thirst for Knowledge"

3) Self-reliance is one of my most important goals

4) I enjoy directing group activities

5) I often worry about the well-being of society

6) Fitness is very important to me

Voluntary Nature of the Study: This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one will treat you differently if you decide not to

be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

Study Risks: Other than some risk of minor discomforts encountered in daily life (i.e., stress, fatigue, personal concerns) or those during the performance of routine psychological examinations or tests, participating in this study should not pose any risk to your safety or wellbeing.

Compensation: In exchange for your participation, upon request, you will receive a 1-2 page written summary of the findings of this study. There will also be complimentary food on sight at the time of your participation (i.e., pizza, vegetable tray, and soda pop) and a monetary gift of $5.00. Of most importance, you will receive the appreciation of the researchers and others who may benefit from what you choose to reveal about the scope and nature of what innately motivates you. If you would you like to know the results about this research study, via e-mail, please check yes to the question at the end of the Informed Consent Form

Privacy: Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Survey data will be kept secure by coding all of your responses using an identity number rather than your name. After the collection of the survey in the student-sealed packets, I will run the uncompleted packets through a paper shredder, place the completed packets in a locked filing cabinet located in a secured room, and store the completed electronic data in a password-protected personal computer. Data will be kept for a period of at least 6 years after completion of the research study and then destroyed. The researcher will give you a copy of the Consent Form to keep for your records.

Contacts and Questions: You may ask any questions you have now or if you have questions later, you may contact the researcher via phone. If you want to talk privately about your rights as

a participant, you can contact the Institutional Research Board (IRB) who can discuss this area of concern with you.

Walden University's approval number for this study is IRB is <u>04-03-18-0078602</u>. Since Walden is only overseeing the analysis of the data, there is no assignment of an expiration date.

<u>Statement of Consent</u>: I have read the above information and I feel I understand the study well enough to make a decision about my involvement. My signature below indicates I am agreeing to the terms described above. (If agreeing via the internet, please type your name and send via your email address.)

Printed Name of Participant: _____

Date of consent: _____

Participant's Signature: _____

Researcher's Signature: _____

Summary of Research Study Results: Would you like to know the results about this research study via e-mail?

 □ Yes

 □ No

Appendix E

10-Item Online Demographic Online Questionnaire

Participant ID: Name:

_____

Email:

_____

Optional Phone Number

Participant Demographic Information: Self Report   _____

Inclusivity and Functionality of Demographic Questions

The survey will include questionnaire items about your academic and personal identity. These items were designed in accord with current research on intentional rationale (i.e., timey trends) and on social identities (American College Personnel Association, 2013; Gender Identity in the U.S. Surveillance, 2014).

Demographic Questions

The following questionnaire items related to your identity and background will be kept confidential, anonymous, and in a secured environment.

1. Academic Class Standing
   □ First year
       □ First-time student: 1st semester
       □ Continuing student: 2nd semester or more
   □ Second-year student
   □ Other, please specify: _____

2. How long have you attended the college?
   □ Currently in my 1st semester
   □ Currently in my 2nd semester
   □ Other, please describe: _____

3. Enrollment Status for Current Semester
   □ Full time: Equal to 12 credits or more
   □ ¾ time: 9-11 credits
   □ Half time: 6-8 credits
   □ Less than half time: Less than 6 credits
   □ Continuing education: Non-credit classes
   □ Not currently enrolled

4. Race / Ethnicity (Select all that apply)
   □ African American / Black
   □ American Indian / Alaska Native
   □ Asian American
   □ Caucasian / White
   □ Hispanic / Latino
   □ Native Hawaiian / Pacific Islander
   □ Other, please describe: _____

5. Sex Assignment at Birth
   □ Male
   □ Female

6. Gender Identity (Select all that apply)
   □ Male
   □ Woman
   □ Trans male / Trans man
   □ Trans female / Trans woman
   □ Genderqueer / Gender non-conforming
   □ Other, please describe: _____

7. Age
   □ 17 or under
   □ 18
   □ 19 – 24
   □ 25 – 39
   □ 40 - 64
   □ 65 or older

8. Disability / Impairment
   □ No
   □ Prefer not to answer
   □ Yes: Please indicate the terms that best describes the condition(s) you experience
        □ Free response: _____

9. Current Employment Status
   □ Full time
   □ Part time
   □ No

10. Religion or Spiritual Practice (Select all that apply)

□ Agnostic
□ Atheist
□ Baptist
□ Buddhist
□ Catholic
□ Christian
□ Hindu
□ Jewish
□ Latter Day Saints / Mormon
□ Lutheran
□ Muslim
□ Pagan
□ Presbyterian
□ Quaker
□ Taoist
□ Unitarian Universalist
□ No Identity
□ Other; please specify: _____

Appendix F

17-Item Demographic Questionnaire

Name:

_____

Email:

_____

Optional Phone Number

Participant Demographic Information: _____
Self Report

Inclusivity and Functionality of Demographic Questions

The survey will include questionnaire items about your academic and personal identity. These items were designed in accord with current research on intentional rationale (i.e., timey trends) and on social identities (American College Personnel Association, 2013; Gender Identity in the U.S. Surveillance, 2014).

Demographic Questions

The following questionnaire items related to your identity and background will be kept confidential, anonymous, and in a secured environment.

1. Academic Class Standing
　□ First year
　　□ First-time student: 1st semester
　　□ Continuing student: 2nd semester or more
　□ Second-year student
　□ Other, please specify: _____

2. How long have you attended the college?
　□ Currently in my 1st semester
　□ Currently in my 2nd semester
　□ Other, please describe: _____

3. Enrollment Status for Last Semester (Fall)
　□ Full time: Equal to 12 credits or more
　□ ¾ time: 9–11 credits
　□ Half time: 6–8 credits
　□ Less than half time: Less than 6 credits

□ Continuing education: Non-credit classes
□ Not currently enrolled

4. Is your current enrollment status limited to one of the following?
□ 12 credit hours
□ 6 credit hours or less
□ Unknown

5. Race / Ethnicity (Select all that apply)

□ African American / Black
□ American Indian / Alaska Native
□ Asian American
□ Caucasian / White
□ Hispanic / Latino
□ Native Hawaiian / Pacific Islander
□ Other, please describe: _____

6. Sex Assignment at Birth
□ Male
□ Female

7. Gender Identity (Select all that apply)
□ Male
□ Woman
□ Trans male / Trans man
□ Trans female / Trans woman
□ Genderqueer / Gender non-conforming
□ Other, please describe: _____

8. Age
□ 17 or under
□ 18
□ 19–24
□ 25–39
□ 40–64
□ 65 or older

9. Disability / Impairment
□ No
□ Prefer not to answer
□ Yes: Please indicate the terms that best describes the condition(s) you experience
□ Free response: _____

10. Current Employment Status
□ Full time
□ Part time
□ No

11. Religion, Spiritual Practice, or Existential Worldview
□ Agnostic
□ Atheist
□ Baptist
□ Buddhist
□ Catholic
□ Christian
□ Hindu
□ Jewish
□ Muslim
□ Latter Day Saints / Mormon
□ Lutheran
□ Muslim
□ Pagan
□ Presbyterian
□ Quaker
□ Taoist
□ Unitarian Universalist
□ No Identity
□ Other; please specify: _____

12. How important is religion or spiritual practice in your life?
□ Very important
□ Somewhat important
□ Not too important
□ Not at all important

13. If you are a Presidents' Honors Scholarship recipient, what (current) semester are you in
□ First semester
□ Second semester
□ Third semester
□ Fourth semester
□ Does not apply to me

**14. If you are an Honors Achievement Award recipient, how many semesters have you been
Program?**

□ 1-2 semesters
□ 3-4 semesters
□ More than 4 semesters
□ Does not apply to me

15. Are you currently on Academic Probation?
□ Yes
□ No

Appendix G

Two-Item Demographic Online Questionnaire

Demographic Questions

The following questionnaire items related to your identity and background will be kept confidential, anonymous, and in a secured environment.

AccumCred16 **Not including the current semester, approximately how many credits have you taken?**

○ 0 - 12

○ 13 - 24

○ 37 - 48

○ 49 - 60

○ More than 60

CumGPA17 **Not including the current semester, approximately what is you cumulative grade point average for courses taken?**

○ 3.75 - 4.00

○ 3.25 - 3.74

○ 2.75 - 3.24

○ 2.25 - 2.74

○ 2.0 - 2.24

○ Less than 2.0

Appendix H

Reiss School Motivation Profile Scores
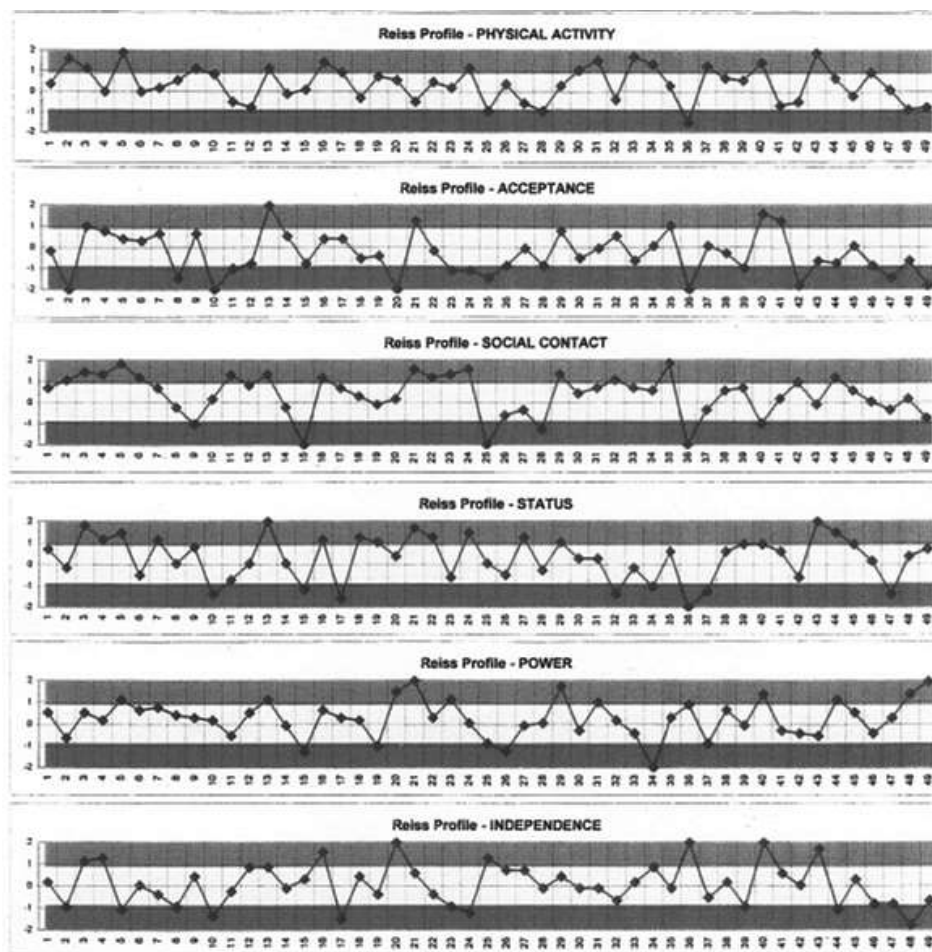
(Kavanaugh, & Reiss, 2003)

Figure H1. Reiss School Motivation Profile Scores: Physical Activity, Acceptance, Social Contact, Status, Power, and Independence (Kavanaugh & Reiss, 2003). The Y scale shows mean standard scores and the X scale shows number of students.
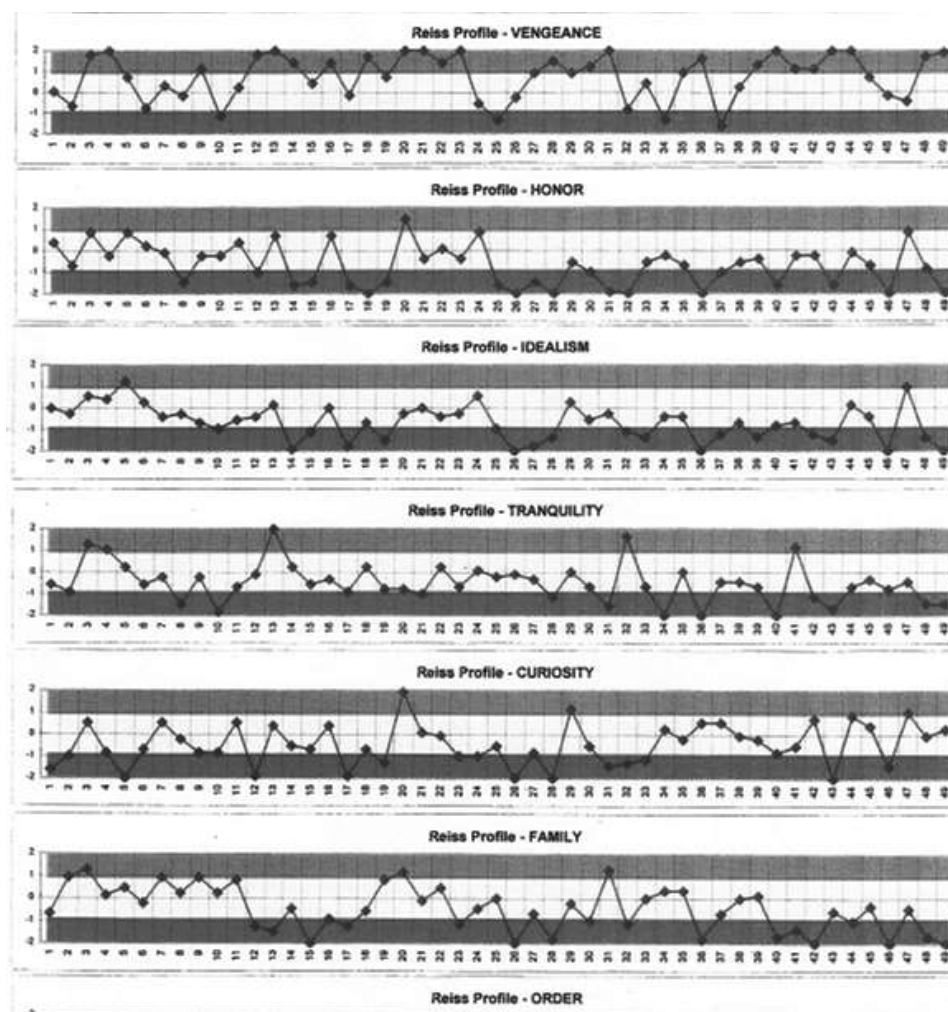
Figure H2. Reiss School Motivation Profile Scores: Idealism, Tranquility, Curiosity, Family, and Order (Kavanaugh & Reiss, 2003). The Y scale shows mean standard scores and the X scale shows number of students.