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Predicting Academic Performance: A Commitment Perspective

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PREDICTING ACADEMIC PERFORMANCE: A COMMITMENT PERSPECTIVE

By

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ABSTRACT

Shifts from scientific and theoretical exploration to occupational preparation within academic scholarship has led researchers to focus on performance variables, such as grade point average (GPA), to better understand how to promote academic success. For example, researchers have examined variables to determine their influence on GPA. The purpose of this study was to identify if commitment variables in conjunction with executive functioning significantly predicted cumulative GPA in a college setting beyond previously established predictors. Results indicated that high school GPA (b = .44) was the only significant predictor of cumulative GPA. When high school GPA was eliminated from analyses, executive functioning (b = .21) significantly predicted cumulative GPA. Additional findings are discussed along with implications and directions for future research.

Keywords: academic performance, identity commitment, academic commitment, executive functioning

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CHAPTER I

Introduction

Academic scholarship has significantly contributed to the development of academic institutions and of specific fields of study, the formulation of societal standards and laws, and the overall promotion of human learning (Green, 2008). There appears to be a shift from scientific exploration to achieving successful outcomes in the workplace, however, in which academic scholarship is used as a tool for learning skills for occupational purposes to achieve a better quality of life. Hence, ensuring academic scholarship continues and that learning occurs may be important for successful transition into the workplace.

Grade point average (GPA) has been a primary indicator of academic performance and an established method for determining if learning has occurred (Pike & Saupe, 2002). Identifying variables that influence GPA may help recognize particular factors that promote or hinder academic scholarship and, in turn, predict successful occupational outcomes. Existing literature (e.g., Lavin, 1965) has attempted to predict GPA by examining performance and non-performance variables. Performance variables refer to an individual's ability to perform on a specified set of tasks (e.g., subtests from a standardized assessment battery) that results in data regarding constructs (e.g., intelligence). Non-performance variables refer to latent factors that are measured through rating scales and considered intrinsic, resulting in psychological or behavioral changes that are either observable (e.g., attendance) or not observable (e.g., personality). Despite

the research database, predicting academic performance through GPA continues to challenge researchers (Van der Merwe & de Beer, 2006).

The goal of this study is to extend the literature by determining if commitment components and executive functioning predict academic performance beyond previously identified performance (e.g., standardized assessment scores) and non-performance variables (e.g., parental education). Commitment (e.g., Ahmadi, Zainalipour, & Rahmani, 2013) and executive functioning (e.g., Best, Miller, & Naglieri, 2011) have been identified as significant predictors of academic performance, which suggests interplay between variables. Commitment will be defined by two models: investment model and the identity development paradigm. The Investment Model (Rusbult, 1980) operationalizes commitment as the intent to persist toward an objective that involves psychological attachment and sense of allegiance. The identity development paradigm (Crocetti, Rubini, & Meeus, 2008) operationalizes commitment as stable decision-making and the self-confidence developed from decisions. Executive functioning (EF) in this study will be defined according to three constructs: attention, self-control and self-monitoring, and planning and initiative (Baars, Bijvank, Tonnaer, & Jolles, 2015). Determining if commitment constructs and executive functioning contribute to performance beyond other predictors may provide guidance for school professionals toward improving academic excellence and promoting academic scholarship.

CHAPTER II

Literature Review

The study of human growth and development has profited from academic efforts directed toward understanding the human condition. In general, academic scholarship has contributed to the advancement of a wide variety of institutions and fields of study, as well as to the development of ethics, standards of conduct, and law. Academic scholarship also encourages human inquiry, such as the meaning of life, morality, and suffering. Overall, the importance of such scholarship is reflected in the scientific and ethical advancements of the past two centuries.

Historically, academic scholarship mostly involved intellectual curiosity and scientific exploration (Boyer, 1990). Consequently, early developed evidenced-based frameworks provided a platform that contemporary researchers are able to challenge and extend, to further our current knowledge of human phenomena. Scientific foundations (e.g., biology) have led to a shift in academic scholarship, resulting in a reduced emphasis on exploratory learning and an increased emphasis on successful outcomes (Barnett, 2005). Academic scholarship may now be perceived as a gateway to better job placement, financial stability, effective family planning, and better quality of life, rather than exploring human phenomena. For example, employers may now require potential employees to have college degrees or hold certifications to meet job qualifications. The shift from scientific exploration to contemporary learning that is directed toward successful outcomes suggests that academic scholarship is now functioning as a

preparation tool for transitioning into the workplace. In other words, this change suggests academic scholarship may now be operating as a procedural tool for learning skills to achieve psychological and emotional fulfillment, satisfactory job placement, and a stable economic foundation.

The shift in academic scholarship from exploratory learning to fulfilling a quality lifestyle (e.g., occupation) appears to have influenced various fields of study. For example, psychological and educational research (e.g., Pike & Saupe, 2002) has determined that academic performance may directly reflect learning, which in turn, is a key indicator of academic scholarship and successful outcomes. Furthermore, higher grades may be an indicator of learning and suggest one's ability to achieve in the workplace. The correspondence between grades and positive outcomes has significant implications for academic performance.

Academic Performance

Lavin (1965) conducted an early review of the literature to operationally define *academic performance*. He defined it as a measure that is tied to educational endeavors that requires a demonstration of skills to verify that learning has occurred. Consequently, researchers have used GPA, standardized assessment scores, and other academic related skills to measure *academic performance*. Assessing performance has helped measure learning and can be an important method for guiding instructional practices (Mascolo, Alfonso, & Flanagan, 2014), evaluating academic personnel (Weishaar, 2007), and providing evidence of academic scholarship that may lead to desired outcomes.

Academic performance has been identified as an important construct within primary, secondary, and postsecondary education to determine successful acquisition of academic knowledge and skills (Mascolo et al., 2014). For example, Rueda (2011) identified that a*cademic performance* promotes self-regulatory behaviors, mastering content, and active learning that prepares students to function in society. The association between academic performance and longer life expectancy, stronger social cohesion, health benefits, and effective family planning (Vila, 2000) also demonstrates its contribution to fulfilling life experiences. Furthermore, the relationship between *academic performance* and job performance (Wise, 1975) suggests its importance for ensuring successful transitioning into the workplace.

Academic performance has also been related to positive outcomes in the workplace and education. For example, Dyer (1987) identified that high school GPA was the strongest predictor of job performance in first-year employees. Employees who performed well in high school were also successful in their first year of employment. Undergraduate and graduate programs may also consider *academic performance* important for admission criteria and to measure potential university completion (Hoffman & Lowitski, 2005). For example, post-secondary institutions may use high school GPA to identify if students have previously exhibited sufficient academic skills to determine if they are capable of completing coursework at the collegiate level. Regarding the workplace and education, a*cademic performance* may function as an indicator that

students have displayed sufficient behaviors (e.g., read and understood content) and have successfully completed course content.

Successful *academic performance* may also correspond with job seeking behaviors. For example, Beal and Crockett (2010) identified a strong positive relationship between GPA and occupational aspirations and expectations. Individuals who previously achieved high *academic performance* reported higher intentions to seek job opportunities that corresponded with their academic strengths, resulting in satisfactory job placements and economic benefit. In all, the association between GPA and positive outcomes signifies that academic learning may lead to success in multiple areas. The acquisition of knowledge indicates successful employment of skills that are necessary for adapting to the workplace. In other words, GPA may demonstrate learning and an individual's readiness to transition into adulthood.

Predictors of Academic Performance

Researchers have examined a multitude of predictors for *academic performance*. For example, standardized assessment scores (Golding & Donaldson, 2006), general intelligence (Ridgell & Lounsbury, 2004), previous grades (Eno, Sheldon, McLaughlin, & Brozovsky, 1999), self-efficacy and self-esteem (Lane, Lane, & Kyprianou, 2004), financial aid (Dynarski, 2003), parental educational attainment (Davis-Kean, 2005), and family resources (Sandefur, Meier, & Campbell, 2006) have been identified as predictors of *academic performance*. Previously identified predictors are referred to as performance and non-performance variables to provide a clear distinction of factors. A performance

variable pertains to measurable behaviors that result in a general outcome toward a more complex construct. For example, one's intelligence quotient (IQ) or achievement ability, according to standardized assessments, would be identified as a performance variable because it is based on how the individual was able to perform on specific tasks. A non-performance variable pertains to non-measurable behaviors that may influence other non-performance or performance variables. For example, one's level of self-esteem may influence the internalization of the importance of socializing (non-performance) and the likelihood of speaking to others (performance). Performance and non-performance variables have been examined to determine their predictive qualities of *academic performance,* which has helped identify variables conducive to academic scholarship and successful outcomes.

Non-performance Variables. Researchers interested in non-performance variables have focused on addressing latent constructs that may affect *academic performance*. Psychological, sociocultural, socioeconomic, and motivational constructs have been used and indicated as significant influences on human behavior and overall *academic performance*. For example, in an extensive literature review and theoretical analysis of the prediction of *academic performance,* Lavin (1965) identified that socioeconomic status, attitudes toward school, positive self-image, and personality variables were significant predictors. Researchers have also examined a combination of non-performance and performance variables to identify significant individual contributions.

Early attempts to identify predictors of *academic performance* examined performance and non-performance variables together. For example, Atwater (1992) examined cognitive abilities, practical intelligence, and personality variables to identify their individual contribution to GPA. Cognitive abilities were measured by Scholastic Aptitude Test (SAT) scores, practical intelligence was measured using the Constructive Thinking Inventory (CTI), and personality variables were measured using the 16 Personality Factors Test (16PF). Practical intelligence measured emotional coping and behavioral coping, which have been identified as important indicators for taking necessary action and self-regulated emotional responses. Personality variables of interest were emotional stability and expedience. Preliminary correlational analyses identified that SAT scores and behavioral coping were significantly positively related to GPA, suggesting interplay between performance and non-performance variables. Regression analyses indicated that behavioral coping scores significantly predicted GPA; lower scores on behavioral coping corresponded with higher GPAs. This finding suggested that participants who reported lower risk-taking behaviors and behaviors involving taking action, performed better academically. This study indicated that non-performance variables predicted *academic performance*. In addition, Atwater's findings align with variable interdependence (i.e., Lavin, 1965) and suggest the possibility of other combinations of variables.

Other researchers have investigated the interplay and predictive value of performance and non-performance variables while controlling for other known predictors.

Specifically, Conard (2006) measured and controlled for performance variables (i.e., aptitude) to determine if non-performance variables individually impacted GPA. The variables measured included: personality variables using the NEO Five-Factor Inventory, aptitude according to SAT scores, and attendance. Results indicated that conscientiousness predicted attendance and that conscientiousness, SAT scores, and attendance predicted GPA. In other words, participants who attended class regularly, possessed vigilant academic behaviors, and who performed well on standardized assessments, also performed well in the classroom. Conard also determined that attendance functioned as a mediating variable in the relationship between conscientiousness and GPA, indicating that careful and diligent academic work in conjunction with classroom attendance may have both been necessary to perform well in the academic setting. The interplay between predictors found in this study suggested a consistent result that points to an interdependent model of performance and non-performance variables.

Steele-Johnson and Leas (2013) investigated the interaction between race and gender and race and personality and their prediction of GPA. The International Personality Item Pool was used to measure the Big Five personality variables: conscientiousness, agreeableness, extraversion, neuroticism, and openness. The researchers found that although race accounted for unique variance in GPA and gender did not, there was not a significant interaction. This finding indicated that the interaction between race and gender did not predict GPA. There were significant interactions

between race and personality worth noting, however. For instance, agreeableness, neuroticism, and conscientiousness significantly predicted GPA for African American women and extraversion and openness significantly predicted GPA in African American men. Lastly, researchers identified that personality variables functioned as moderators for the relationship between race and GPA. The race and personality interactions indicated personality might have different effects on individuals according to their race and/or ethnicity.

The relationship between the Big 5 Personality variables and *academic performance* (e.g., Blickle, 1996) suggests a significant combination. For example, Chamorro-Premuzic and Furnham (2003) focused on personality variables and academic behavioral indicators (ABI) to determine their predictive value of written exam scores and performance on a final project. Personality variables were measured using the Big Five and the Gigantic Three inventories and ABIs were measured through continual assessment of participants' absenteeism, essay writing, and classroom conduct. Results indicated that neuroticism, conscientiousness, and psychoticism significantly predicted overall and final project grades. Participants who worked diligently, completed their work with little stress, and who were less aggressive were more likely to perform well academically.

Researchers have also examined the predictive value of personality in conjunction with self-perception and motivational variables. For example, Metofe, Gardiner, Walker, and Wedlow (2014) attempted to identify the influence of self-esteem (i.e., Rosenberg

Self-Esteem Inventory), self-efficacy (i.e., New General Self-Efficacy Scale), conscientiousness (i.e., Big-Five Inventory), and motivation (i.e., Work Performance Inventory) on GPA. Preliminary correlational analyses revealed significant positive relationships between self-efficacy and extrinsic motivation and GPA, indicating that participants who reported high beliefs in their abilities and to be driven by outside forces (e.g., praise from others) corresponded with high GPAs. Regression analyses indicated that self-efficacy, intrinsic motivation, and extrinsic motivation were significant predictors of GPA. Self-efficacy and extrinsic motivation were positive predictors of GPA and intrinsic motivation was a negative predictor of GPA in the regression analysis. These results suggested that high levels of self-efficacy and extrinsic motivation and low levels of intrinsic motivation predicted participants' reports of GPA. Participants who reported higher levels of confidence in their abilities, who completed tasks for external rewards, and who reported lower internal values of work were more likely to have higher GPAs. Conscientiousness was not found to be a predictive factor in this study.

Pintrich and De Groot (1990) examined self-regulation and motivational measures to determine their influence on completion of classwork, performance on quizzes and tests, and performance on essays and reports. Specifically, motivation and self-regulation were assessed through self-efficacy, intrinsic value, test anxiety, and cognitive strategy-use measures. Researchers found that self-efficacy and intrinsic value were positively associated with higher grades in seatwork, quizzes and tests, and essays and reports. This finding suggested that participants' reports of a high sense of effectiveness toward

classwork and who internalized their classroom duties corresponded with better classroom performance. Results also indicated that test anxiety was inversely related to performance on essays and reports, indicating a relationship between stress and poor performance in essays and reports. Furthermore, regression analyses of classwork performance revealed significant predictive qualities of self-regulation, test anxiety, and cognitive strategy-use. Participants who reported self-regulatory behaviors (e.g., working hard to obtain a good grade despite not liking a class), less test anxiety, and use of cognitive strategies to complete work (e.g., using old assignments and class resources to complete new assignments) also performed better academically.

Self-regulatory academic behaviors, such as self-discipline may also be predictive of *academic performance*. For example, Duckwork and Seligman (2005) sought to determine if self-discipline predicted report card grades, standardized achievement scores, and attendance more than an intelligence quotient (IQ) in eighth-grade students. The Eysenck I.6 Junior Impulsiveness Subscale and the Brief Self-Control Scale were used to measure self-control and the Otis-Lennon School Ability Test Seventh Edition (OLSAT7) Level G measured intelligence. Results indicated that self-discipline significantly predicted report card grades, standardized achievement scores, and attendance more than IQ. Participants who reported higher self-control performed better academically, independent of IQ. Duckwork and Seligman also found that self-discipline predicted gains in *academic performance* over the school year. These findings suggested that participants' ability to self-regulate their thoughts, emotions, and behaviors predicted

their performance in academic assignments, achievement assessments, and class attendance over time. In other words, self-regulatory behaviors may help with one's ability to reduce impulsivity and behave in accordance with academic goals and objectives.

Sommer & Dumont (2011) sought to identify if help seeking, academic motivation, academic adjustment, self-esteem, perceived stress, and academic overload were associated with participants' end-of-year average. These measures assessed for self-reported attitudes and behavioral tendencies related to seeking help, intrinsic and extrinsic motivation, global feelings of well-being, stress, and overwhelming feelings. Results indicated that academic overload and adjustment significantly predicted end-of-year averages. Participants who performed well academically reported fewer feelings of being overwhelmed and better adjustment to changes in the academic setting. In addition, extrinsic motivation and amotivation significantly predicted end-of-year averages, indicating that participants who reported more external reinforcement for performing or a lack of motivation performed lower academically. Self-esteem and perceived stress were not significant predictors of *academic performance*.

Socioeconomic variables have been identified as predictors of *academic performance*. For example, Sackett, Kuncel, Arneson, Cooper, and Waters (2009) measured a combination of predictor variables to determine if socioeconomic factors mediated the relationship between standardized assessment scores and GPA. Standardized SAT scores, socioeconomic status (SES) as measured by parental income

and education, and freshman GPA from a large dataset were examined. The review of the dataset indicated that controlling for SES did not affect the relationship between SAT scores and GPA. This finding suggested that parental income and/or education may not be influencing the relationship between standardized assessment scores and *academic performance*. Non-performance environmental variables (i.e., parental education) may not have a significant impact on an individual's ability to perform on standardized assessments and/or in an academic setting.

Predictive research has also measured the impact of demographic variables. *Academic performance* may be influenced by structural environmental variables such as geographic location, proximity to institutions (e.g., prisons), and community opportunities (e.g., library access). Thiele, Singleton, Pope, and Stanistreet (2014) investigated archival data to determine if socio-demographic characteristics affect *academic performance*, as measured by school grades. Results indicated that contextual variables, namely index of multiple deprivation and neighborhood participation, were significantly negatively associated with school grades. Participants from increasingly deprived areas and from neighborhoods with little participation were less likely to perform well in school. The two contextual variables that predicted *academic performance* in this study exemplify the influence of non-performance measures.

Differences between students across type of institution may also influence one's ability to perform in a collegiate setting. For example, Early and Winton (2001) identified the following challenges faced by students from two-year and four-year

institutions: completing work or family related responsibilities, lack of motivation, and lack of preparation or skill. They found that students from 2-year institutions completed less work, were less motivated, and were less academically prepared than students from 4-year institutions. This finding suggests differences across institutions that may impact student's ability to perform in an academic setting. Early and Winton further explained the multidimensionality of such differences, as they may be influenced by faculty, institution, and community factors.

Performance Variables. Researchers who have examined the predictive qualities of performance variables on *academic performance* have addressed individual constructs. For example, Stroup (1970) examined the predictive qualities of the Scholastic Aptitude Test (SAT) on grade-point-average (GPA) for college freshman. Preliminary correlational analysis indicated that SAT Math and Verbal scores were strongly correlated with freshman GPA. Participants who performed well on the SAT also reported higher GPAs. In addition, regression analyses indicated SAT scores were significant predictors of GPA. Participant's performance on the SAT was a significant predictor of GPA. Overall, standardized assessment scores were identified as an important contributor to *academic performance*.

Harackiewicz, Tauer, Barron, and Elliot (2002) provided additional evidence identifying the predictive qualities of standardized assessment scores on GPA, but also included high school GPA. The researchers used SAT and American College Testing (ACT) scores and high school GPA in college freshman to determine their predictive

value of college-level GPA. The results indicated that high school GPA and standardized assessment scores significantly predicted short- and long-term GPA. Participant's previous academic work and standardized assessment scores predicted their *academic performance* in a college setting.

The use of high school records influenced other researchers to further examine previous academic successes. For example, Eno, Sheldon, McLauglin, and Brozovsky (1999) assessed high school records using archival data to determine their predictive qualities on college freshman success, as measured by performance in their coursework. The data analysis indicated that high school variables such as high school rank, GPA, and SAT scores were significant contributors to success during freshman year. In other words, high school performance and standardized assessment scores predicted *academic performance* during the first year of college. In a similar study, Hoffman and Lowitzki (2005) found that high school GPA and SAT scores were also predictive of college success. Individuals who performed well in high school and on standardized assessments also had high GPAs while in college, indicating that previous academic successes may provide a functional foundation for future educational endeavors.

Standardized assessments have varied in use to determine their predictive value of *academic performance*. For example, Luo, Thompson, and Detterman (2003) sought to determine if there was an underlying cognitive factor mediating the relationship between general intelligence and scholastic performance. Eleven subtests from the Wechsler Intelligence Scale for Children- Revised (WISC-R) measured general intelligence, the

Cognitive Abilities Test (CAT) assessed for cognitive processes, and the Metropolitan Achievement Test (MAT) measured scholastic performance. It is important to note that although GPA was not the outcome measure in this study, the MAT provided reading, mathematics, and language scores that are key for developing academic skills (Mascolo et al., 2014). Results indicated that mental speed functioned as a mediator between general intelligence and MAT scores, indicating that successfully performing tasks with fluency could be affecting one's overall intellectual capacity to complete reading, math, and language tasks. In other words, processing speed was the variable that linked general intelligence to academic skills.

Relationships between intelligence and *academic performance* resulted in additional concerns regarding their connection. For example, Colom, Escorial, Chun Shih, and Privado (2007) looked at the influence of fluid intelligence and memory span on participants' classroom performances on nine scholastic areas of the school curriculum (e.g., natural sciences, English, mathematics). Fluid intelligence was measured by the abstract reasoning subtests from the Differential Aptitude Test (DAT-5) and the inductive reasoning subtests from the Primary Mental Abilities (PMA). The researchers found that performance on standardized measures for fluid intelligence and memory span significantly predicted grades in the scholastic areas of their curriculum. Participants' standardized assessment scores on abstract and inductive reasoning tasks and digit-span and attention-shifting tasks predicted *academic performance*. This finding indicated that *academic performance* was closely related to problem-solving behaviors,

adaptability, and executive functioning skills, which have all been associated with early academic success and post-secondary education efforts (Flanagan & Harrison, 2012).

Gathercole, Pickering, Knight, and Stegmann (2004) examined working memory to determine if this cognitive process was affecting the ability to perform successfully on English, mathematics, and science assessments. The assessments included academic tasks (i.e., reading, writing, and mathematics) and tests (i.e., reading comprehension, spelling, and mathematics). Working memory was measured using 3 subtests from the Working Memory Test Battery for Children (WMT). Researchers found that standardized scores on working memory tasks were significantly positively related to English, mathematics, and science assessments. Participants' ability to recall and cognitively manipulate information was associated with higher scores on assessments requiring use of literacy and mathematical skills.

Standardized assessment scores have also been used to predict performance in more advanced educational endeavors. Kuncel, Hezlett, and Ones (2001) conducted a meta-analysis to examine the predictive qualities of the graduate record examination (GRE) on graduate performance as measured by GPA. A trend in the literature indicated that GRE scores and undergraduate GPA were valid predictors of graduate GPA. Kuncel, Hezlett, and Ones found that participants who performed well during their undergraduate studies and on the GRE also performed well during their graduate training. These results suggested that the predictive qualities of standardized assessment scores are consistent in early and more advanced education.

Researchers have also examined predictor variables aside from standardized assessment scores. Specifically, the relationship between high school performance and *academic performance* may indicate that specific academic behaviors are learned and in place to be successful in the classroom. For example, study skills (Lavin, 1965), attendance (Human-Vogul & Rabe, 2015), and note taking (Mascolo et al., 2014) have been identified as key indicators of academic success. Hence, students who learn these skills early during development may be able to effectively transition into the college setting and reach their academic potential. For example, Golding and Donaldson (2006) examined the predictive qualities of performance in entry courses in a computer science program on overall GPA. The results indicated that successful performances in gateway courses predicted participants' final GPA in the computer science program. This finding suggested that entry-level performance was strongly associated with future academic success. The implications of this finding suggested that early academic skills might carry over into the college setting and significantly impact overall performance.

Performance in gateway courses may have been related to student preference and, therefore, may also be linked with *academic performance*. Affendey, Paris, Mustapha, Nasir Sulaiman, and Muda (2010) used archival data to determine if students' ranking of first-year courses would predict GPA in a computer science program. Results suggested that selected 'major' courses significantly contributed to the prediction accuracy of students' cumulative GPA at the end of the program. Participants who selected preferred 'major' courses at the onset of their college careers performed better academically than

those who did not select preferred courses. This finding has implications distinguishable from previous research because emphasis was placed more on preference for coursework than specific performance-based measures. Nonetheless, participant's performance on highly ranked courses significantly predicted *academic performance*.

High school academic behaviors and standardized assessment scores have consistently been identified as significant predictors of *academic performance* (Pike & Saupe, 2002). Despite their predictive qualities, however, previous academic skills and/or exceptional standardized assessment scores may not be resistant to academic obstacles. For example, social isolation, failing grades, family changes, and other intrinsic and extrinsic factors could influence one's ability to successfully function in post-secondary education. Some researchers have investigated this concern to determine if an exceptional academic profile is resistant to college attrition. For example, Corengia, Pita, Mesurado, and Centeno (2012) sought to determine the link between standardized assessment scores and *academic performance* and their relationship with attrition in college students. Standardized assessments scores were derived from the Differential Abilities Test (DAT) and *academic performance* was measured using first-year GPA. The researchers found that DAT scores on abstract and verbal reasoning was a significant predictor of GPA and may also help predict attrition in some programs. In other words, the relationship between standardized assessment scores and *academic performance* may also influence students' resistance to academic obstacles and intrinsic and/or extrinsic

changes, which could lead to academic scholarship, successful outcomes, or early dropout.

Researchers who have examined *academic performance* have used statistical methods such as correlational, regression, and structural equation modeling procedures. Other statistical methods that utilize more complex statistical analyses may help deduce the variables that predict academic success. For example, Vandamme, Meskens, and Superby (2007) used discriminant analysis to identify a model comprising variables that significantly contributed to university performance. The identified model indicated that attendance, previous academic experience, and study skills were significantly related to mid-year and end-of-year university performance. The performance variables within the model support previously identified relationships between academic skills learned in early education and future *academic performance* (e.g., Mascolo et al., 2014).

Executive Functioning. Performance variables such as intelligence and achievement assessment scores have accounted for significant variance of *academic performance*. However, executive functioning skills have also been strongly related to academic-related behaviors. Executive functioning (EF) pertains to complex cognitive skills related to planning, organization, judgment, self-regulation, and reasoning (Hebben & Milberg, 2009) that allow individuals to actively attend to stimuli and continuously process information to behave toward an objective or goal (Mascolo et al., 2014). Attending to, planning, organizing, and regulating one's behavior toward academics are

essential aspects of learning, promoting successful skill development and *academic performance*.

Latzman, Elkovitch, Young, and Clark (2010) wanted to measure EF contribution to *academic performance* beyond intelligence. Executive functioning was measured using the Delis-Kaplan Executive Function Systems, which assessed for conceptual flexibility, monitoring, and inhibition. *Academic performance* was measured with the Iowa Tests of Basic Skills (ITBS) and Iowa Tests of Educational Development (ITED) achievement tests, which assessed four academic domains (i.e., reading, mathematics, social studies, and science), and intelligence was assessed with the Kaufman Brief Intelligence Test, Second Edition (KBIT-2). Preliminary correlational data indicated that EF was strongly positively related to all four domains of *academic performance*, indicating a linear relationship between levels of flexibility, monitoring, and inhibition and performance scores on the achievement assessments. Regression analyses involved a step-wise procedure where intelligence and EF were entered one at a time to determine their contribution to *academic performance*. Results suggested that EF significantly contributed to the prediction of performance on reading, mathematics, social studies, and science. Specifically, conceptual flexibility contributed to reading and science, monitoring contributed to reading and social studies, and inhibition contributed to mathematics and science scores. In all, participants with higher sorting, verbal fluency, and switching abilities performed well on the achievement assessments.

To further examine the impact of EF, Visu-Petra, Cheie, Benga, and Miclea (2011) assessed working memory, inhibition, and shifting, which required participants to complete tasks regarding short-term memory, sustained attention, and switching behaviors. *Academic performance* was defined as participants' semester grades in Mathematics and Romanian. A step-wise regression analyses involved entering age in step 1, working memory in step 2, inhibition in step 3, and shifting in step 4 to determine variable accountability for semester grades. Results indicated that working memory, inhibition, and shifting significantly predicted performance. Specifically, working memory was the strongest predictor, followed by shifting and inhibition. These findings suggested that participants who performed well in short-term recall, switching from one stimulus to another, and maintaining their directed attention toward specific tasks also experienced successful academic grades for Mathematics and Romanian.

Willoughby, Blair, Wirth, and Greenberg (2012) investigated particular EF abilities they believed were related to reading and math skills. Three dimensions of EF, working memory, inhibitory control, and attention shifting were measured with six tasks developed by the authors. The Woodcock-Johnson III Tests of Achievement (WJ-III) measured reading and math skills. Overall, results indicated that participant's performance on the EF tasks was strongly correlated with reading and math scores. High performance on tasks requiring information selection and manipulation, attentional control, and switching between stimuli corresponded with higher performance on standardized reading and math achievement assessments.

Researchers have also targeted specific academic skills to determine if EF directly influences its development. For example, Foy and Mann (2013) examined the relationship between EF and early literacy skills. EF was measured using verbal and nonverbal computerized tasks that measured participant's ability to shift attention, inhibit responses, and switch between tasks. Early literacy skills were measured with participant's performance on letter naming, phonological awareness (i.e., ability to remove syllables, single phonemes, and phonemes in blends from known words), and identifying real and pseudo-words. Foy and Mann also controlled for working memory and expressive language to eliminate their impact on the relationship between EF and early literacy skills. Results suggested that EF, specifically verbal inhibitory abilities, were more positively related to early reading than other verbal or nonverbal abilities when age, working memory, and expressive language were controlled. This finding implies that participants who successfully inhibited their responses during nonverbal tasks performed higher on naming letters, letter-sound manipulation, and overall reading. On the other hand, participants who successfully inhibited their responses during verbal tasks scored lower on naming letters, letter-sound manipulation, and overall reading. Results of this study provided additional support regarding the influence that inhibiting behaviors have on academic skills. Specifically, participants with advanced inhibitory abilities may be able to selectively attend to information during silent reading time without distraction. On the other hand, participants with advanced inhibitory abilities

may not be able to selectively attend to information during choral or read-out-loud activities.

Engel de Abreu et al. (2014) investigated previously identified relationships (e.g., Foy & Mann, 2013) to further determine EF impact on academic skills. The following four components of EF were measured: cognitive flexibility, working memory, inhibition (i.e., interference suppression and response inhibition), and selective attention. Participants completed performance tasks such as card sorting, recalling numbers, imitating while inhibiting responses, and circling pairs of items. Teacher ratings of reading comprehension, decoding, writing, mathematics, and oral language were used to assess *academic performance*. Results indicated strong positive relationships between working memory/cognitive flexibility and teacher ratings for all academic skills. Participants who were able to successfully remember increasing amounts of information and sort pieces of information were rated as having better literacy and math abilities. In addition, strong positive relationships were found between interference suppression and teacher ratings for all academic skills. This indicated that participants who were able to successfully process information while resisting distractions were rated as possessing higher literacy and math skills. Lastly, selective attention and response inhibition were associated with reading abilities, which indicated that participants who were able to selectively target pieces of information and control their responses were also rated as better readers. The results of this study align with previous research (e.g., Pimperton &

Nation, 2010) and support the notion that EF abilities may facilitate the development of academic skills.

Best, Miller, and Naglieri (2011) targeted the following EF abilities: matching numbers, planned codes, and planned connections to determine their relationship with reading and math assessment scores across age groups. The three EF abilities were measured using the Cognitive Assessment System (CAS) and assessed participants' abilities to create a plan of action, monitor its effectiveness, and complete a task with accuracy. *Academic performance* was measured with nine reading and math ability subtests from the Woodcock-Johnson Tests of Achievement-Revised (WJ-R). Results indicated consistent positive relationships between EF and reading and math assessment scores across age groups. Specifically, the matching numbers and planned codes subtests were similarly related to assessment scores. Participants who performed well on tasks that required attending to stimuli for matching and constant monitoring also did well on their reading and math assessments. The planned connections subtest was not consistently related to assessment scores across different age groups. This finding indicated that sequential planning may be more related to reading and/or math abilities at certain points than others; planning may be more important for a seven year-old than a fourteen year-old student.

Fuhs, Nesbitt, Farren, and Dong (2014) investigated the correspondence between EF and standardized achievement scores to determine their influence on four subtests from the Woodcock-Johnson Tests of Achievement III (WJ-III) that measured

mathematics, language, and reading across a year and a half (i.e., three instances). The direction of their study was based on a previous finding (i.e., Fuhs & Turner, 2012) that identified associated variance between specific EF abilities and *academic performance* in preschoolers: inhibitory control, working memory, and attention flexibility. The selected EF tasks measured number recall, copy design, card sorting, imitation, item selection with distraction, and motoric behaviors requiring inhibition. Fuhs, Nesbitt, Farren, and Dong found that EF measures were consistently positively correlated with subtests on the WJ-III, specifically with mathematics, across the three assessment periods. Overall, high performance on EF measures corresponded with high performance on achievement assessments.

Nesbitt, Farran, and Fuhs (2015) wanted to identify the contribution of 'learning' behaviors toward EF and performance on the reading, spelling, academic knowledge, and mathematics standardized assessments within the WJ-III. Previously identified relationships between 'learning' behaviors and teacher ratings of *academic performance* (e.g., Sasser, Beirman, & Heinrich, 2015) indicated mediating influence between EF and performance. Nesbitt, Farren, and Fuhs measured attention shifting, working memory, and inhibitory control with five tasks that required participants to: sort cards, copy designs, recall and manipulate information, and follow motoric instructions. The Child Observation in Pre-school (COP) measured the following 'learning' behaviors: average level of involvement during activities, active engagement in sequential behaviors (e.g., working on a puzzle), social learning interactions with or without the teacher, and

unoccupied and disruptive behaviors that indicated disengagement from activities or disruptive. Preliminary correlational analyses indicated significant positive relationships between EF skills and 'learning' behaviors and performance on the WJ-III. Furthermore, path analyses, to determine if 'learning' behaviors functioned as mediators, indicated that level of involvement, sequential learning behaviors, and unoccupied or disruptive behaviors partially mediated the relationships between EF and reading and mathematics scores. Participants with better EF skills who had higher levels of involvement, were more actively engaged in sequential behaviors, and were less likely to be disengaged or disruptive, achieved greater gains in reading and mathematics performance. Social learning interaction was not found to be a mediator, indicating that participants' social interactions with the teacher or with peers did not contribute to existing EF skills and performance on reading and mathematics.

Relationships between EF skills and *academic performance* may also indicate the development of a conceptual academic understanding. For example, Rhodes et al. (2014) sought to determine if EF skills that were related to working memory, inhibition, planning, and attention shifting would predict conceptual understanding of biology. Participants completed tasks that required them to: store and manipulate information while working toward a goal, control their responses on a visual and auditory task, arrange items into sockets, and shift their focused attention between stimuli. *Academic performance* was measured with a two-part biology assessment that included a factual-based and conceptual-based section for understanding. Preliminary correlational analyses

indicated that planning was positively related to the factual-based biology assessment and that working memory and planning ability were positively related to the conceptual-based biology assessment. Overall, these correlations suggested a positive association between planning ability and working memory and *academic performance*. Regression analyses indicated that EF significantly predicted performance on the factual-based and conceptual-based biology assessment. Specifically, planning ability was the strongest predictor of factual-based and working memory and planning ability were the strongest predictors of conceptual-based biology assessments. The results of this study suggested that participants who exhibited adequate planning abilities also understood biology material on a factual and conceptual basis.

The consistently identified relationship between EF and *academic performance* has encouraged researchers to examine causal implications. For example, Jacob and Parkinson (2015) conducted a meta-analytic review to investigate previous research to determine if a causal association exists between EF and *academic performance*. Various EF skills were identified and deduced to the following abilities: response inhibition, attention control, attention shifting, and working memory. Response inhibition pertained to the ability to override automatic responses and attention control referred to the ability to attend to specific stimuli while disregarding distractions. Attention shifting regarded the ability to control and flexibly shift focus while disregarding distractions and working memory was identified as the ability to maintain and manipulate information over a short period of time. *Academic performance* used in the meta-analysis was standardized

achievement assessment scores. GPA, homework completion, and teacher reports were excluded because of their association with academic and behavioral aspects of performance. Results of the meta-analysis indicated that most studies in the review examined the association between working memory and academic achievement scores, followed by assessing multiple EF skills, response inhibition, attention control, and attention shifting. This trend in the literature suggested a general interest toward identifying the relationship between working memory and standardized achievement scores, which could be associated with empirical attempts to teach working memory for academic purposes (e.g., Melby-Lervåg & Hulme, 2013). First, preliminary correlational data indicated that EF skills were strongly associated with achievement scores, with working memory and attention shifting more closely related to reading achievement than attention control or response inhibition. Next, regression analyses were used to measure EF predictive qualities while controlling for other previously identified predictors of academic achievement (IQ, previous academic achievement, socio-economic status, gender, etc.). The overall prediction values indicated little evidence that a causal relationship existed between EF and standardized academic achievement scores. Reviewed articles that conducted regression analyses indicated non-significant EF prediction values when controlling for previously identified predictors. Results of this meta-analytic review suggested that EF and *academic performance* might not be casually related.

Previously identified relationships between EF abilities and *academic performance* indicate a general impact of working memory, inhibition, attention control and shifting, and planning on the acquisition, fluency, generalization, and maintenance of academic skills. Positive associations between EF skills and classroom performance have intervention implications. Therefore, fostering the development of working memory and/or other EF skills may lead to the improvement of academic skills that promote *academic performance*.

Previously identified performance and non-performance variables have contributed to the prediction of *academic performance*. High school performance, standardized assessment scores, and personality are consistent variables that contribute to *academic performance,* which suggests early-developed academic skills (e.g., study skills and test-taking skills) and latent constructs may greatly benefit future educational endeavors. Lavin's (1965) early review of predictor variables indicated a large area of scientific growth and experimental inquiry.

Commitment

Commitment is a term often used when referring to relationships and/or hobbies that require a significant amount of time and effort to maintain. Hence, commitment may be defined as an allotted amount of dedication, attention, and focus toward a specific domain that evokes psychological and behavioral changes. Extensive literature has examined the relationship between commitment and performance (Benkhoff, 1997). Researchers, however, have found inconsistent relationships and mixed views of

commitment's direct influence on behaviors. Poor measures of commitment may be affecting the appropriate assessment of commitment and preventing the development of a clear and concise method of measurement.

The use of appropriate instruments has been a key endeavor in order to assess for the relationship between commitment and outcome measures. For example, Benkhoff (1997) examined bank employees' commitment, according to the Organizational Commitment Questionnaire, to determine its link to organizational performance. Results indicated that the organizational commitment reported by employees was connected to the financial successes of bank branches. This finding demonstrated a connection between committed employees and occupational performance.

Considering the relationships between *academic performance* and job performance (e.g., Wise, 1975), commitment may also be related to academic behaviors. Committed behaviors associated with exceptional occupational performance (e.g., adherence to instructions) may originate and develop during primary and secondary education. Hence, commitment to educational endeavors may be a significant predictor of *academic performance*. For example, Khaola (2014) wanted to identify the connection between participants' second and third year grade averages and overall weighted means (OWM) and their commitment, self-esteem, and organizational citizenship behavior. Commitment was measured using a short survey adapted from previous commitment scales (Cook & Wall, 1980 and Meyer & Allen, 1984), self-esteem was measured with the General Self-Esteem Scale, and organizational citizenship behavior (OCB) was

measured with an instrument that assessed five dimensions (i.e., altruism, courtesy, civic virtue, conscientiousness, and an aggregate score). Commitment in this study referred to one's attachment, identification, and involvement with their academic institution. Khaola found that commitment was significantly positively related to grade averages after the second and third year and to OWM. This suggested that higher levels of commitment corresponded with higher grades and performance. Other identified positive relationships with *academic performance* included the OCB dimensions altruism and civic virtue, indicating that willingness to help other students and active involvement in school activities corresponded with better grades. The overall results of this study indicated the significant relationship between participants' attachment and involvement with their institution and their ability to perform in the classroom.

Researchers have also measured commitment, within broader constructs, and its impact on *academic performance*. For example, Sheard (2009) examined the predictive qualities of age, gender, and 'hardiness' on GPA and dissertation marks. 'Hardiness' was measured by the Personal Views Survey III-R and comprised a combination of three components: commitment, control, and challenge, which provided an overall measure of individual pursuits despite known uncertainty. Sheard found that the commitment component of 'hardiness' and gender significantly predicted GPA and dissertation marks. Regarding 'hardiness', this finding indicated that participants who reported significant commitment also performed better academically and received generally positive

dissertation marks. Commitment was found to be a significant contributor to the prediction of *academic performance*.

Ahmadi, Zainalipour, and Rahmani (2013) further investigated the predictive value of 'hardiness' and it three components (i.e., commitment, control, and challenge) on *academic performance*. 'Hardiness' was assessed with the questionnaire from Sheard (2009), however, the same components were measured to determine their impact on GPA only. Correlational results indicated significant relationships between the three components and GPA, suggesting a general positive association between levels of commitment, control, and challenge and *academic performance*. Regression analysis identified that commitment, control, and challenge significantly predicted GPA. Commitment and challenge were the most significant contributors and were determined to be the strongest predictors. This study indicated that there may a linear relationship between commitment and GPA, which provides additional support for examining the influence of commitment on *academic performance*.

The Investment Model. Commitment has also been used to predict other significant domains such as longevity in romantic relationships. For example, Rusbult (1980) posited that commitment is preceded by satisfaction, investment, and quality of alternatives in an Investment Model to identify the underlying process of successful relationship outcomes. Overall, researchers have found that high satisfaction and investments toward social domains (e.g., academics) in conjunction with low quality of alternatives predict commitment levels and are associated with successful outcomes. The

Investment Model has been validated (Rusbult & Farrell, 1983) and widely used to assess commitment in various areas (e.g., academic success). Hence, commitment and its three antecedents may predict persistence and/or allegiance toward academic work that leads to *academic performance*.

In an early investigation, Kluger and Koslowsky (1988) sought to determine if academic commitment significantly predicted final class grades and GPA. Academic commitment was measured using the Investment Model, which comprised the commitment, satisfaction, investment, and quality of alternatives components. Results indicated that the Investment Model significantly predicted final grades and GPA, suggesting important implications for commitment and *academic performance*. Specifically, participants who reported higher levels of commitment, satisfaction, and investment and lower levels of quality of alternatives achieved better academic outcomes. This study indicated that committed behaviors directed toward academics could lead to the development of academic skills that promote success in the classroom.

Consequently, Human-Vogel and Rabe (2015) wanted to identify if academic self-regulation behaviors were connected to academic commitment. Self-regulation behaviors were measured with the Differentiation of Self-Inventory-Revised (DSI-R) and academic commitment was measured with the Academic Commitment Scale (ACS), which was adapted from a previously used Investment Model (i.e., Rusbult, Martz, & Agnew, 1998). Self-regulation behaviors were identified as setting learning goals, study management, and time spent on studies and academic commitment comprised four

dimensions that assessed academic persistence, satisfaction, and investment in conjunction with little interest in alternative options. Human-Vogel and Rabe found that participants who set learning goals reported higher satisfaction, invested more time and effort toward their studies, and were less likely to see better alternatives than studying. They also found that participants who reported effective study management also indicated higher levels of satisfaction and greater investment. Lastly, they identified that time spent on studies was associated with commitment and investment levels. The overall results of this study indicated that self-regulation behaviors were related to academic commitment. Participants' reports of high academic satisfaction and investment corresponded with more learning goals and better study management skills. Furthermore, participants' reports of high academic commitment and investment corresponded with more time studying. This study suggested that commitment, satisfaction, and investment toward academic behaviors indicated successful academic outcomes as a result of self-regulatory behaviors.

The Investment Model may be a useful paradigm for determining commitment's impact on academic outcomes. Its initial use for predicting relationship longevity and occupational performance suggest robust properties within significant social domains. Adapting the Investment Model to fit the academic setting will allow for a close investigation of academic commitment in conjunction with levels of satisfaction, investment, and quality of alternatives. The constraints imposed by academic commitments (e.g., adherence to syllabi) may promote academic behaviors (Human-

Vogel & Rabe, 2015) that are conducive to *academic performance*. In other words, dedication to school and willingness to continue onward despite obstacles or setbacks could be the impetus for academic engagement and overall academic success.

Human-Vogel and Rabe's (2015) measure of academic commitment may be an appropriate method for measuring commitment. The Academic Commitment Scale (ACS) was based on a line of research that examined commitment and its antecedents in romantic relationships. In an early attempt to understand important underlying components of relationships, Rusbult (1980) introduced the Investment model that measured investment size, quality of alternatives, level of satisfaction, and commitment to determine their predictive qualities. He found that satisfaction, quality of alternatives, and investment size were strong predictors of commitment to a relationship. In addition, greater commitments resulted in fewer quality alternatives and greater investments. Commitment and its antecedents toward romantic relationships may be comparable within academics because of similar dedication and sacrificial processes.

The validity of the Investment Model has been demonstrated across different domains. For example, the model has been shown to predict job commitment (Rusbult & Farrell, 1983), romantic relationship outcomes (Rusbult, Martz, & Agnew, 1998) and academic success (Kluger & Koslowsky, 1988) in various populations (e.g., diverse ethnicities). In a meta-analytic review of the Investment Model literature, Le and Agnew (2003) examined the contribution of the model across domains and found that it best predicted commitment and favorable outcomes for relationships. No other studies

selected in the meta-analytic review reported enough information to conclude the predictive power of commitment in other domains. The limited use within academics suggests a void in the literature, however. Therefore, the Investment Model could provide additional support regarding its effectiveness in identifying the predictive qualities of commitment on *academic performance*.

Identity Commitment. Investigating identity commitment may provide additional insight into *academic performance*. Historically, identity has been identified as a construct that influences psychological, emotional, and behavioral aspects, which may lead to positive and negative outcomes (Erikson, 1959). Most research has used Marcia's (1964, 1966) theoretical model to measure identity. The two-factor model measures an individual's personal investment (i.e., commitment) toward a sociocultural domain and the active involvement of examining available options (i.e., exploration) after experiencing a crisis. The two-factor model permitted the classification of four identity statuses: *achievement, foreclosure, moratorium,* and *diffusion*. High levels of commitment and exploration were indicative of an *achieved* status, which suggested arriving at a commitment through exploration and crisis. High commitment levels and low exploration levels suggested a *foreclosed* status, which was characteristic of rigid commitments, inflexibility, and conforming to traditional expectations. Low commitment levels and high exploration levels indicated a *moratorium* status, suggesting a period of active struggle with societal, internal, and parental demands. Low levels of

both variables implied a *diffused* status, signifying an overall lack of commitment and disinterest in ideological matters.

Identity commitment within the achieved and foreclosed statuses suggests two distinct processes of commitment. Committed behaviors observed within the achieved status suggest an experienced crisis and individual journey that resulted in a specific commitment toward a sociocultural domain. Committed behaviors observed within the foreclosed status suggest an inheritance of sociocultural values that have been accepted through incidental learning or tradition. The two statuses comprise distinct commitments and will be referred to as open and closed. Open commitment refers to committed behaviors reported by individuals in the achieved status and closed commitment refers to committed behaviors reported by individuals in the foreclosed status.

Extensive identity research has identified relationships between identity statuses and psychological well-being (Meeus, 1996), intrinsic and extrinsic religiosity (Markstrom-Adams & Smith, 1996), ability to complete complex tasks (Kroger & Marcia, 2011), and other overt and covert behaviors. Little research, however, has been conducted over the connection between identity and *academic performance*. For example, Waterman and Waterman (1972) conducted an early investigation to determine the association between freshman participant's identity status and *academic performance* over six semesters. Identity was measured using Marcia's (1966) model and *academic performance* was measured by the number of students who: pursued their original college plans, changed their college plan, or withdrew from school. Results indicated that most

moratorium participants changed their college plans and withdrew without applying to another program. This finding aligned with previous research that has connected the moratorium status with a lack of commitment toward important societal domains (Kroger & Marcia, 2011). In addition, the GPAs of students who withdrew were examined for differences. Waterman and Waterman found that achieved participants possessed the highest GPA when they withdrew, followed by moratorium, foreclosed, and diffused. This suggested that achieved participants left school in 'good standing' while foreclosed and diffused participants may have been forced due to poor performance. Despite the differences in GPA at the point of withdrawal, however, a significant difference was not found. Overall, the results of this study suggested reasonable interplay between identity and *academic performance*. Participants who reported open commitments at the time of withdrawal had higher GPAs than participants who reported closed or no commitments.

Academic behaviors that may affect performance include study skills (Mascolo et al., 2014), setting learning goals (Human-Vogel & Rabe, 2015), and adaptation skills (Winston & Miller, 1987). Berzonsky and Kuk (2000) examined the link between identity status and successful adaptation to the university setting. Identity was measured using Marcia's (1966) model and university adaptation was measured with the Student Developmental Task and Lifestyle Inventory (SDTLI), which assessed students' academic autonomy, abilities to develop mature interpersonal relationships, and establishment of educational purpose. Berzonsky and Kuk found that the achieved status was associated with higher levels of educational purpose. This finding suggested that

reports of open commitments corresponded with well-defined educational goals and effective management skills related to their academics. In addition, the diffused and foreclosed statuses were associated with lower levels of mature interpersonal relationships. Reports of closed or no commitments corresponded with intolerance of others or difficulties forming peer relationships. Lastly, the diffused status was associated with lower levels of academic autonomy, indicating that reports of no commitments were related to difficulties with planning, executing, and monitoring their academic behaviors. The overall results of this study suggested that participants who reported open commitments also reported more behaviors conducive to university adaption and that closed or no commitments were related to more problems with adjusting to academic demands.

Other conceptualizations of identity have also been related to *academic performance*. For example, Lounsbury, Huffstetler, Leong, and Gibson (2005) sought to determine if sense of identity was related to academic achievement beyond personality variables. Sense of identity (SI) was defined as having a clear sense of self and knowing one's personal values or moral standards. SI aligned with Marcia's (1966) achieved identity, which suggests positive associations with maturity, autonomy, decision-making, and open commitment. The Adolescent Personal Style Inventory (APSI) was used to measure participant's sense of identity and the Big Five personality variables (i.e., agreeableness, conscientiousness, neuroticism, extraversion, and openness to experience). *Academic performance* was measured using participant's self-reported GPA. Preliminary

correlational analysis indicated strong positive correlations between personality variables and sense of identity and GPA. Sense of identity was the strongest correlate, indicating a linear relationship between self-concept and open commitment and reported GPAs. Regression analysis suggested sense of identity significantly predicted GPA beyond the Big Five personality variables. This finding indicated that sense of identity might be a better indicator of GPA than personality. In other words, participants who reported possessing open commitments and a clear sense of purpose also performed better academically.

Additional identity research has examined relationships with academic behaviors. For example, Was, Al-Harthy, Stack-Oden, and Isaacson (2009) wanted to determine if identity was associated with academic goals. The Academic Identity Measure (AIM) measured identity, which assessed Marcia's (1966) identity statuses (e.g., achieved). Academic achievement goals were measured with the Achievement Goal Questionnaire (AGQ), which assessed performance-approach-, performance-avoidant-, and mastery-goal orientations. The performance-approach goal orientation pertained to having a positive perception of one's ability and competing with others to demonstrate ability. The performance-avoidant goal orientation referred to having a negative perception of one's ability and avoiding situations that would demonstrate a lack of abilities. The mastery goal orientation suggested a focus on learning and mastering specific tasks. Preliminary correlational analysis indicated that the mastery goal orientation was significantly positively related to the achieved status and significantly negatively related

to the diffused and moratorium statuses. Focused learning corresponded with reports of open commitments and was inversely related to possessing no commitments. In addition, the performance-approach goal orientation was significantly positively associated with the foreclosed status (i.e., closed commitments). Furthermore, the performance-avoidant goal orientation was significantly positively related to the foreclosed, diffused, and moratorium statuses and significantly negatively related to the achieved status. Path analyses were conducted to examine the identified correlations. Significant path coefficients were found between the foreclosed and moratorium statuses and performance-avoidant goals, the foreclosed status and performance-approach goals, and the achieved status and mastery goals. The results of this study indicated that openly committed participants reported a higher level of focus toward learning academic material and mastering academic concepts. On the other hand, participants who reported closed or no commitments reported more negative perceptions of their academic abilities and higher avoidant academic behaviors (e.g., not volunteering to read in class). Participants who indicated closed commitments reported more positive perceptions of their academic abilities and higher competitive academic behaviors (e.g., competing in a science fair).

Hejazi, Lavasani, Amani, and Was (2010) further investigated if Marcia's (1966) identity model contributed to academic goal orientation and *academic performance*. The same instruments for measuring identity and academic goals highlighted in Was, Al-Harthy, Stack-Oden, and Isaacson (2009) were used, with the exception that a measure of

performance was included. *Academic performance* was measured by the average of 10 exam scores. Preliminary correlational analysis indicated that the mastery goal orientation was significantly and positively related to the achieved status and significantly and negatively related to the diffused and moratorium statuses. The performance-approach goal orientation was significantly and positively associated with the achieved status and significantly and negatively associated with the diffused status. The performance-avoidant goals orientation was significantly and positively related to the foreclosed, diffused, and moratorium statuses. Regarding average exam scores, the achieved status was significantly and positively related and the moratorium, diffused, and foreclosed statuses were significantly and negatively related. Results of this study indicated that open commitments corresponded with higher exam scores and closed and no commitments were related to lower performance. Regression analyses indicated that, although negative, the diffused and foreclosed statuses were the best predictors of average exam scores. Participants who reported closed or no commitments best predicted performance.

The relationships between identity status and *academic performance* (e.g., Was, Al-Harthy, Stack-Oden, & Isaacson, 2009) were based on Marcia's (1964,1966) two-factor model. New conceptualizations of identity have been proposed that have expanded on previous identity research. Specifically, Crocetti, Rubini, and Meeus (2008) developed the Utrecht-Management of Identity Commitments Scale (U-MICS) to assess identity through commitment (CT), in-depth exploration (IE), and reconsideration of

commitment (RC). Variations of each dimension also produced five identity statuses that satisfied theoretical underpinnings of identity: *achieved*, *moratorium*, *foreclosed*, *diffused*, and *searching moratorium* (Crocetti, Rubini, Luyckx, & Meeus, 2008). High CT and IE levels, and low RC levels suggested an *achieved* status. High CT, moderately low IE, and low RC levels suggested a *foreclosed* status. Low CT, moderately high IE, and high RC levels indicated a *moratorium* status. Low levels of all three dimensions implied a *diffused* status. High levels of all three dimensions indicated a *searching moratorium* status. The U-MICS was initially used to assess identity through an educational and interpersonal domain, which has implications for identity and *academic performance*.

The U-MICS may help further assess the relationship between identity and *academic performance* and extend the current literature. Specifically, the commitment dimension of the identity paradigm could provide additional insight into the association between open and closed commitments and GPA. Identifying the type of commitment may have implications for addressing difficulties regarding dedicated and persistent academic behaviors.

Rationale of the Study

Academic scholarship is now identified as a gateway to better job placement, financial stability, effective family planning, and better quality of life. Consequently, acquired academic skills are now functioning as procedural tools that help prepare for educational or occupational endeavors. To determine the acceptable acquisition of knowledge, performance grades are used as indicators of learning that provide

measurable data for progress monitoring. Specifically, grade-point-averages (GPA) are computed and used to demonstrate successful acquisition and development of skills. Furthermore, existing literature has identified GPA as a predictor of post-secondary success (Lavin, 1965). High GPA may be related to skill acquisition and affect one's ability to obtain an advanced degree or high paying job conducive to other positive circumstances (e.g., strategic family planning). Examining variables predictive of GPA will help identify patterns and trends for ensuring academic success that lead to successful outcomes. A large body of research has examined relational and predictive properties of performance (e.g., standardized assessment scores) and non-performance (e.g., self-discipline) variables on *academic performance*. Correlational and regression analyses have provided important direction regarding which variables are most consistently related to and predictive of academic behaviors and performance. For example, standardized assessment scores and high school performance have been identified as the two most consistent predictive performance variables (Kuncel, Hezlett, Ones, 2001) and personality constructs have been identified as the most consistent predictive non-performance variables (Conard, 2006).

Academic commitment and identity commitment may be significant predictors of *academic performance*, considering previously identified relationships and predictive qualities. Executive functioning (EF) has also been extensively researched and determined to be strongly correlated with and predictive of performance (e.g., Rhodes et al., 2014). Hence, academic commitment, identity commitment, and EF may account for

additional variance of *academic performance* not addressed by previously identified performance and non-performance variables. Research has indicated the contribution of numerous variables to understand *academic performance*, therefore, measuring and controlling for previously identified predictors would provide a clear understanding of the prediction of other variables. Therefore, the purpose of this study is to determine if academic commitment, identity commitment, and EF are significant predictors of *academic performance* beyond standardized assessment scores, high school performance, extracurricular activity involvement, parental income and education, and gender. *Academic performance* will be measured using cumulative GPA from the 2014-2015 school year.

The following hypotheses were introduced to further understand the predictive qualities of academic commitment, identity commitment, and executive functioning (EF):

1. Standardized assessment scores (i.e., SAT/ACT scores), high school GPA, extracurricular activity involvement, parental income and education, and gender will significantly predict *academic performance*.
2. Identity commitment, academic commitment, and executive functioning will significantly predict *academic performance* beyond standardized assessment scores (i.e., SAT/ACT scores), high school GPA, extracurricular activity involvement, parental income and education, and gender.

CHAPTER III

Method

Participants

The original sample comprised a total of three hundred and eighty-two college students from two 4-year universities and one 2-year community college, located in the southern United States. Both universities and the community college are public institutions that practice enrollment procedures that require the completion of state or placement exams. In order to address the previously stated hypotheses, sophomore level students were individually selected from the sample population based on their recent college admission (e.g., completion of standardized assessments) and their existing college record (e.g., GPA from a previous semester). Freshmen, juniors, seniors, and graduate students were excluded from analyses because of their distance from college admissions (i.e., beyond sophomore level) or their nonexistent college record (i.e., freshman). The final sample comprised one hundred and thirteen sophomores. The mean age was 21.22 (SD = 4.04), most participants were female (78%), and most participants were from the 4-year institutions (64%). The majority of participants were of Caucasian (42%) or Latino/a (42%) descent. Cumulative GPA for the 2014-2015 academic school year ranged from 1.50 to 4.00 (M = 3.06, SD = .57). Table 1 includes additional demographic information about the sample used for analysis.

Table 1

Summary of Demographic Information for Sophomore Level Participants (n = 113)

Demographics	Frequency	*M*	*SD*	Missing Data
Gender				
Male	23			
Female	90			
Age		21.22	4.04	
Parental Income				
$0 – $34,999	37	33%		
$35,000 – $50,000 +	76	67%		
Mother's Education				
Higher Education Experience	76	67%		
No Higher Education Experience	37	33%		
Father's Education				
Higher Education Experience	56	50%		
No Higher Education Experience	57	50%		
Race / Ethnicity				
White	48	42%		
Black or African American	11	10%		
Hispanic or Latino	47	42%		
Asian	4	3%		
Native Hawaiian or Pacific Islander	3	3%		
Location				26 (23%)
Southeast	10	9%		
Southwest	77	68%		
Type of Institution	4-year University	2-year Community College		
	n = 56	*n* = 31		26

Procedure and Materials

Professors from two 4-year universities and one 2-year community college were contacted and asked if they were interested in participating. Participating professors either distributed the study in an email that included the url link or utilized Sona Systems within their respective universities. Participants completed the study via email link that directed them to the online survey platform (i.e., Qualtrics, Sona Systems). The survey comprised a demographic sheet and the following three questionnaires:

The Academic Commitment Scale (ACS) was used to measure commitment and its three antecedents: satisfaction, quality of alternatives, and investment. The ACS was adapted from the Rusbult et al. (1998) investment model of commitment scale to suit the academic setting. Modifications of the original investment model required changes in the wording of items so that "academic work" was the object of commitment. The ACS assesses the following dimensions with composite scores: commitment, satisfaction, quality of alternatives, and investment. Five items measured commitment (α = .82), which refers to a determination to complete academic work until finished as opposed to giving up (e.g., I want to continue with my academic work). Eight items measured satisfaction (α = .92), which pertains to one's satisfaction with their academic work (e.g., My academic work gives me a great deal of satisfaction). Five items measured investment (α = .92), which refers to the time and effort one puts into their academic work (e.g., I feel very involved in my academic work-like I have put a great deal into it). Three items measured quality of alternatives (α = .81), which pertains to preference for

doing something else other than academic work (e.g., If I had a choice, I would rather do something other than academic work). The 21 items are rated on a Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree).

The Utrecht-Management of Identity Commitments Scale (U-MICS) measured identity. The U-MICS assesses three dimensions of identity with the following composites: Commitment, In-depth exploration, and Reconsideration of commitment. Commitment (CT) refers to firm choices and self confidence that result from these choices, In-depth exploration (IE) pertains to reflecting on current commitments and searching for additional information, and Reconsideration of Commitment (RC) refers to comparing current commitments with alternative commitments when present values are no longer satisfactory. There are 13 items on the U-MICS: 5 measuring CT (e.g., my education gives me security in life), 5 assessing IE (e.g., I try to find out a lot about my education), and 3 assessing RC (e.g., I often think it would be better to try to find a different education). The 13 items are rated on a Likert scale ranging from 1 (completely untrue) to 5 (completely true). Cronbach's Alpha levels were .85 for commitment, .77 for in-depth exploration, and .83 for reconsideration of commitment, respectively. The internal consistency for all 13 items was calculated as .70.

A modified version of the Amsterdam Executive Function Inventory (AEFI) was used to measure executive functioning (EF). The modified AEFI (Baars, Bijvank, Tonnaer, & Jolles, 2015) was adapted from the AEFI introduced by Van der Elst et al. (2012), which was designed to assess three domains: attention, self-control and self-

monitoring, and planning and initiative. Attention pertains to selective and sustained attention, self-control and self-monitoring refers to working memory and self-regulation, and planning and initiative pertains to planned behaviors directed toward objectives. The 10 items on the AEFI are used to derive three composite scores: 3 measuring attention (e.g., I am not able to focus on the same topic for a long period of time), 4 measuring self-control and self-monitoring (e.g., I often react too fast. I've done or said something before it is my turn), and 3 measuring planning and initiative (e.g., I am well organized. For example, I am good at planning what I need to do during a day). The 10 items are self-reported on a Likert scale ranging from 1 (not true) to 3 (true). Cronbach's Alpha levels were .79 for attention, .76 for self-control and self-monitoring, and .76 for planning and initiative, respectively. The internal consistency for all 10 items was calculated as .78.

Academic performance was measured via self-report through the demographic information form. Participants reported their cumulative GPA for the 2014-2015 school year. Furthermore, high school GPA, standardized assessment scores (i.e., SAT and ACT), parental income and education, extracurricular activity involvement, and gender information was collected within the demographic information form.

Analyses Strategies

Using a two-step regression procedure, the following analyses were conducted:

Step 1: Standardized assessment score, high school GPA, extracurricular activity involvement, parental income and education, and gender were regressed on cumulative GPA (CGPA).

Step 2: Identity commitment, academic commitment, and executive functioning were included in a new model, in conjunction with the variables from the previous step, and regressed onto CGPA.

Data Screening

Prior to analysis, identity commitment, academic commitment, executive functioning, standardized assessment score, final high school GPA, and cumulative GPA were examined for missing values, normality of distributions, and the assumptions of multivariate analysis. Skewness and kurtosis values were assessed to determine normality violations. With the exception of extracurricular activity involvement and academic commitment, skewness and kurtosis were found to be within the normal range for all variables. Extracurricular activity involvement was negatively skewed and academic commitment was positively skewed. Missing values were found for 'cumulative GPA' and 'standardized assessment score'. The two cases that had missing values within the 'cumulative GPA' variable (n = 111) were still included in the analysis because other variables were fit for use (e.g., standardized assessment score). The twenty-four cases that had missing values within the 'standardized assessment score' variable (n = 89) were also included within the analysis because other variables were fit for use (e.g., GPA variables). Univariate outliers were assessed to identify their influence

on the overall dataset. Two cases comprised outliers within the 'academic commitment' variable and were excluded from analyses. Singularity and multicollinearity were evaluated with a correlational matrix to determine if performance and/or non-performance variables measured similar constructs. Correlation coefficients indicated that there was no multicollinearity among variables.

The dataset was examined to appropriately analyze the influence of standardized assessment scores on *academic performance*. Due to differences in scoring criteria between the standardized assessments and fewer responses to the SAT assessment question, scores were converted to effectively use assessment scores within the data analysis. Specifically, the conversion table reported by StudyPoints (2016) was used to convert SAT scores to ACT scores. For example, an SAT score of 1500 that was not paired with an ACT score was converted to 21 (the ACT score that corresponds with the SAT score of 1500). The conversion from SAT scores to ACT scores was decided due to the overall fewer SAT scores reported. ACT scores were the primary scores used to determine the relationship and predictive value of standardized assessment scores on *academic performance*.

In addition, dichotomous variables were used to appropriately assess the influence of parental income and education levels on *academic performance*. For example, parental income prompts included: $0 - $14,999, $15,000 - $24,999, $25,000 – $34,999, $35,000 - $49,000, and $50,000 +. One of the assumptions of conducting regression analyses is that variables are either continuous or dichotomous (Field, 2009). Hence a

variable was computed that separated parental income into two factors: $0 - $34,999 and $35,000 - $50,000 +. This process was also applied to parental education level, which indicated: no higher education experience and higher education experience.

CHAPTER IV

Results

Preliminary Analyses

Table 2 includes means, standard deviations, ranges, missing cases, and final *n* values for each performance, non-performance, and CGPA variables. As can be seen in this table, 79% of participants reported standardized assessments scores. Therefore, further analyses only included participants who reported standardized assessment scores. Participants who did not report assessment information were omitted from analyses because a full profile that comprised scores for all performance and non-performance variables was necessary.

Scores for each variable were computed in order to assess for normality. Results of the preliminary analyses indicated that high school GPA, standardized assessment score, identity commitment, executive functioning, and cumulative GPA (CGPA) were normally distributed. Skewness values of 1.157 (*SE* = .227) for extracurricular activity involvement indicated a negatively skewed distribution and skewness values of -.850 (*SE* = .227) for academic commitment indicated a positively skewed distribution. These values suggested higher reports of low extracurricular involvement and higher reports of high academic commitment. Scatterplots were created to assess linearity between CGPA and performance and non-performance variables. Linear relationships were identified between high school GPA, standardized assessment score, extracurricular activity involvement, identity commitment, academic commitment, and executive functioning

and cumulative GPA. Furthermore, univariate outliers were classified as scores of any variable above 3 standard deviations from the mean to identify their influence on the overall dataset. Two individual cases were identified as outliers within the academic commitment variable. The two cases were excluded from further analyses. Final sample information is presented in Table 2.

Table 2

Summary of Performance, Non-performance, and Cumulative GPA Variables (*n* = 113)

Variable	*M*	*SD*	Range	Missing Data	*n*
Standardized Assessment Score	22.66	3.77	18	24	89
High School GPA	3.32	.45	2.00	2	111
Extracurricular Activity Involvement (hours per week)	6.89	6.40	30		113
Identity Commitment	21.12	2.93	11		113
Academic Commitment	27.53	2.44	10		113
Executive Functioning	22.40	4.12	17	2	111
Outcome Variable					
Cumulative GPA (CGPA)	3.06	.57	2.50	2	111

Relationships between Predictor Variables

Associations between predictive variables and the outcome variable were examined to identify significant relationships between predictors and CGPA. See Table 3 for correlations between standardized assessment score, high school GPA, extracurricular activity involvement, parental income and education, gender, identity commitment, academic commitment, executive functioning, and CGPA. Results from the correlation matrix indicated that there were significant positive relationships between CGPA and the following variables: high school GPA ($r = .48$, $p < .001$), parental income ($r = .25$, $p < .01$), and executive functioning ($r = .24$, $p < .05$). This finding suggested a medium relationship between high school GPA and CGPA and a small relationship between parental income and executive functioning and CGPA. No statistically significant relationships were found between CGPA and: standardized assessment score, extracurricular activity involvement, gender, identity commitment, academic commitment, or parental education.

Table 3

Summary of Intercorrelations between Predictor Variables and Outcome Variable (n = 113)

Measure	1	2	3	4	5	6	7	8	9	10	11	*n*
1. SAS	1	.18	-.20	.30**	.08	.08	-.13	-.10	-.02	.03	.18	89
2. HS GPA		1	-.04	.30**	-.07	.13	.19*	.17	.20*	.20*	.48**	111
3. EA			1	.04	.29**	.10	-.18	-.08	.02	-.01	-.02	113
4. PI				1	.08	.16	.02	.08	.15	.01	.25**	113
5. ME					1	.31**	-.07	.05	.07	-.09	.00	113
6. FE						1	-.11	.10	.14	.08	.16	113
7. Gender							1	.14	-.04	.12	.04	113
8. IC								1	.44**	.10	-.05	113
9. AC									1	.14	.03	113
10. EF										1	.24*	111
11. CGPA											1	111

** p < .05, two-tailed, ** p < .01, two-tailed*

Note: SAS = Standardized Assessment Score, HS GPA = High School Grade Point Average, EA = Extracurricular Activity, IC = Identity Commitment, AC = Academic Commitment, EF = Executive Functioning, PI = Parental Income, ME = Mother's Education, FE = Father's Education, CGPA = Cumulative Grade Point Average (Dependent Variable)

Regression Analyses with Predictor Variables

A two-step regression analysis was conducted to determine the predictive qualities of the aforementioned performance and non-performance variables on CGPA. Step 1 included standardized assessment score, high school GPA, extracurricular activity involvement, parental income and education, and gender (model 1). Step 2 included identity commitment, academic commitment, and executive functioning (model 2). Results indicated that model 1 and model 2 were statistically significantly predictive of CGPA. Refer to Table 4 for regression values for each variable within both models.

Step 1 significantly predicted cumulative GPA, $F(7, 79) = 3.86$, $p = .001$; $R^2 = .26$. This finding suggested that these variables accounted for 26% of the variance within CGPA. The regression equation was $\hat{Y} = .96 + .01$ (standardized assessment score) + .56 (high school GPA) + .00 (extracurricular activity involvement) + .10 (parental income) + .00 (mother's education) + .10 (father's education) + -.04 (gender). This shows that high school GPA ($b = .44$) was the greatest predictor of CGPA. Standardized assessment score, extracurricular activity involvement, parental income and education, and gender did not significantly contribute to the prediction of cumulative GPA.

Step 2 also significantly predicted cumulative GPA, $F(10, 76) = 3.29$, $p = 001$; $R^2 = .30$. This finding suggested that these variables accounted for 30% of the variance within CGPA. However, despite the statistically significant result, the 4% added by Step 2 variables did not account for variance above and beyond Step 1 predictors. The generated regression equation for Step 2 was $\hat{Y} = 1.46 + .00$ (standardized assessment

scores) + .56 (high school GPA) + .00 (extracurricular activity involvement) + .13 (parental income) + .04 (mother's education) + .09 (father's education) + -.05 (gender) + -.03 (identity commitment) + -.01 (academic commitment) + .02 (executive functioning). Table 4 shows beta, standard error (SE), and standardized beta values for each of the predictor variables. Overall, these results suggest that high school GPA accounts for the greatest variance of student's GPA during their second year in college.

Table 4

Summary of Regression Analyses for Variables Predicting Cumulative GPA (n = 86)

Predictor Variables	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Standardized Assessment Score	.01	.02	.06	.00	.02	.03
High School GPA	.56	.14	.44***	.56	.14	.44***
Extracurricular Activities	.00	.01	-.01	.00	.01	-.03
Parental Income	.10	.13	.09	.13	.13	.11
Mother's Education	.00	.13	.00	.04	.13	.03
Father's Education	.10	.12	.08	.09	.12	.08
Gender	-.04	.15	-.03	-.05	.15	-.04
Identity Commitment				-.03	.02	-.13
Academic Commitment				-.01	.03	-.06
Executive Functioning				.02	.01	.17
Overall R^2 and (R^2 change)		.26***			.30*** (.04)	

*Note. * p < .05, two-tailed, ** p < .01, two tailed, *** p < .001, two tailed.*

Analyses without High School GPA

Academic behaviors exhibited during secondary and postsecondary education suggest there may be similar indicators of academic performance. For example, students who learn and practice study skills, academic planning, organization, communicating academic needs, and using resources early in education may carry these behaviors into the college setting and lead to achievement. Students who see success from early developed academic behaviors may be more likely to continue practicing them while in higher education. Moreover, the use of similar skills across secondary and post-secondary settings might have implications regarding the connection between high school and college performance (Belfield & Crosta, 2012). Because high school GPA and college GPA can be considered similar variables, the same two-step regression analyses were conducted, without high school GPA, to determine if step 2 variables predict college GPA above and beyond step 1 variables. This time, Step 1 included standardized assessment score, extracurricular activity involvement, parental income and education, and gender (model 1) and step 2 included identity commitment, academic commitment, and executive functioning (model 2). Results indicated that both models were not statistically significantly predictive of CGPA. See Table 5 for beta, standard error (SE), and standardized beta values for each of the predictor variables. These results indicated that, as a group, performance and non-performance variables (except for high school GPA) did not predict CGPA. Although both models did not significantly predict CGPA, results indicated that executive functioning (b = .22) was a significant predictor. This

finding suggested that reports of attention, self-control and self-monitoring, and planning and initiative may have an impact on performance in the college setting.

Table 5

Summary of Regression Analyses for Variables, excluding high school GPA, Predicting Cumulative GPA (n = 86)

Predictor Variables	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Standardized Assessment Score	.02	.02	.13	.02	.02	.10
Extracurricular Activities	.00	.01	.03	.00	.01	.00
Parental Income	.23	.14	.19	.25	.14	.20
Mother's Education	-.08	.14	-.07	-.04	.14	-.03
Father's Education	.17	.13	.15	.15	.13	.13
Gender	.10	.16	.07	.07	.16	.05
Identity Commitment				-.02	.02	-.10
Academic Commitment				.00	.03	-.01
Executive Functioning				.03	.02	.22*
Overall R^2 and (R^2 change)		.10			.15 (.05)	

*Note. * p < .05, two-tailed, ** p < .01, two tailed, *** p < .001, two tailed.*

Executive functioning can be considered separate from commitment, based on different underlying psychological and emotional behaviors. Specifically, executive functioning involves working memory, inhibition, and organization, which can be distinguished from the dedicated time, effort, and attachment that amount to commitment. Moreover, a distinction can be made between the practical use of executive functioning skills and the theoretical underpinnings of commitment. Therefore, a two-step regression analyses was conducted to determine if executive functioning predicted college GPA above and beyond step 1 variables. Step 1 included standardized assessment score, extracurricular activity involvement, parental income and education, and gender (model 1) and step 2 included executive functioning (model 2). Results indicated executive functioning ($b = .21$, $p < .05$) significantly predicted CGPA above and beyond variables in model 1. This finding indicated attention, self-control, and planning predicted above and beyond previously identified predictors. See Table 6 for beta, standard error (SE), and standardized beta values for each of the predictor variables.

Table 6

Summary of Regression Analyses for Step 1 variables and Executive Functioning, Predicting Cumulative GPA (n = 86)

Predictor Variables	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Standardized Assessment Score	.02	.02	.13	.02	.02	.11
Extracurricular Activities	.00	.01	.03	.00	.01	.02
Parental Income	.23	.14	.19	.23	.13	.20
Mother's Education	-.08	.14	-.07	-.05	.14	-.04
Father's Education	.17	.13	.15	.14	.13	.12
Gender	.10	.16	.07	.06	.15	.04
Executive Functioning				.03	.02	.21*
Overall R^2 and (R^2 change)		.10			.14 (.04*)	

*Note. * p < .05, two-tailed, ** p < .01, two tailed, *** p < .001, two tailed.*

Type of Institution as a Predictor. A number of investigations have suggested that type of institution influences GPA. For example, Strauss and Volkwein (2002) found that students attending 2-year institutions reported higher GPAs and lower levels of academic growth than those attending 4-year institutions. They also found that high school rank and classroom experiences were more predictive of GPA at 4-year institutions than 2-year institutions. Thus, separate regression models were proposed for participants from 2-year and 4-year institutions. For these analyses, participants from 2-year and 4-year institutions were selected using SPSS's "*select cases"* filtering procedure to help determine the influence of type of institution on predicting CGPA. Two-step regression analyses were conducted using previously identified predictors and identity commitment, academic commitment, and executive functioning. Step 1 included standard assessment score, extracurricular activity involvement, parental income and education, and gender (model 1). Step 2 included identity commitment, academic commitment, and executive functioning (model 2). For the 2-year and 4-year institutions, both models did not significantly predict CGPA, indicating that all performance and non-performance variables across type of institution were not statistically significantly predictive of CGPA. Table 7 and Table 8 include beta, standard error (SE), and standardized beta values for each of the predictor variables within the 2-year and 4-year institutions. It is worth noting that, within model 2 for the 4-year institution, identity commitment (b = -.43, p = .060) and academic commitment (b = .40, p = .069) were

approaching significance, which suggests that commitment might have predictive qualities with a larger sample size.

Table 7

Summary of Regression Analyses for Variables Predicting Cumulative GPA in 4-year Institutions (n = 41)

Predictor Variables	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Standardized Assessment Score	-.01	.03	-.08	-.01	.03	-.06
Extracurricular Activities	.00	.02	.03	-.01	.02	-.07
Parental Income	.14	.22	.11	.24	.22	.19
Mother's Education	-.03	.20	-.03	.05	.20	.04
Father's Education	.19	.19	.18	.21	.19	.19
Gender	.24	.22	.20	.24	.22	.19
Identity Commitment				-.08	.04	-.43
Academic Commitment				.08	.04	.40
Executive Functioning				.00	.02	.00
Overall R^2 and (R^2 change)		.07			.19 (.12)	

*Note. * p < .05, two-tailed, ** p < .01, two tailed, *** p < .001, two tailed.*

Table 8

Summary of Regression Analyses for Variables Predicting Cumulative GPA in 2-year Institution (n = 21)

Predictor Variables	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Standardized Assessment Score	.05	.03	.50	.04	.03	.45
Extracurricular Activities	.01	.02	.14	.00	.02	.05
Parental Income	-.25	.24	-.29	-.19	.24	-.22
Mother's Education	-.17	.22	-.20	-.14	.20	-.17
Father's Education	.16	.23	.18	.10	.22	.12
Gender	.35	.28	.31	-.03	.33	-.02
Identity Commitment				.06	.04	.45
Academic Commitment				-.05	.04	-.25
Executive Functioning				.03	.02	.30
Overall R^2 and (R^2 change)		.21			.42 (.21)	

*Note. * p < .05, two-tailed, ** p < .01, two tailed, *** p < .001, two tailed.*

Type of institution was also examined for difference across predictor variables. General findings indicated participants from 4-year institutions reported higher standardized assessment score, high school GPA, identity commitment, academic commitment, executive functioning, and cumulative GPA. Therefore, t-test analyses were conducted to identify significant differences between predictor variables across type of institution. Results indicated that there was a significant difference in executive functioning between institutions, $t(84) = 2.59$, $p < .05$. Students from 4-year institutions ($M = 23.24$, $SD = 3.87$) reported significantly higher executive functioning than students from the 2-year institution ($M = 20.90$, $SD = 4.25$). Furthermore, findings indicated a significant difference between cumulative GPA across institutions, $t(83) = 3.59$, $p < .001$. Students from 4-year institutions ($M = 3.18$, $SD = .54$) reported significantly higher cumulative GPAs than those from the 2-year institution ($M = 2.77$, $SD = .42$). All other differences across institutions were not significant. Table 9 includes means and standard deviations of predictor variables across institutions.

Table 9

Summary of Predictor and Cumulative GPA Variables across Type of Institution

Variable	4-year (n = 42)		2-year (n = 22)		*t-test*	*p*
	M	*SD*	*M*	*SD*		
Standardized Assessment Score	22.93	3.63	21.87	4.45	1.04	*ns*
High School GPA	3.32	.45	3.15	.48	1.65	*ns*
Extracurricular Activity Involvement	6.39	6.64	6.58	6.21	-.13	*ns*
Identity Commitment	21.57	2.92	20.71	3.09	1.29	*ns*
Academic Commitment	27.37	2.63	26.97	2.36	.72	*ns*
Executive Functioning	23.24	3.87	20.90	4.25	2.59	.05
Cumulative GPA (CGPA)	3.18	.54	2.77	.42	3.59	001

CHAPTER V

Discussion

The purpose of this study was to examine variables that best predict cumulative GPA in the college setting. It was hypothesized that previously identified variables such as standardized assessment score, high school GPA, extracurricular activity involvement, parental income and education, and gender would predict college GPA. Results of this study supported this hypothesis, indicating that previously identified variables predicted cumulative GPA. This finding suggested that, as a model, standardized assessment score, high school GPA, extracurricular activity involvement, parental income and education, and gender predict sophomore GPA. However, high school GPA was identified as the only statistically significant predictor of college GPA. This finding is not surprising, considering that academic skills such as reading, writing, math, and academic strategies (e.g., mnemonics) learned and practiced during early educational experiences may be carried into the college setting. For example, not only has high school GPA been identified as the best predictor of college performance (Scott, Spielmans, & Julka, 2012), Belfield and Crosta (2012) found that when controlled, the impact of standardized assessment scores were significantly smaller. They concluded that the relationship between high school GPA and college GPA is essential for understanding college placement, considering the notion that a student's college GPA is likely to be slightly below their high school GPA. Overall, high school performance is identified as a consistent predictor of college performance based on the employment of similar

academic skills (reading, writing, planning, etc.) and further strengthening of academic strategies within the college setting (Belfield & Crosta, 2012).

The influence of high school GPA has implications regarding early educational experiences. For example, the predictive qualities of high school GPA above other variables (e.g., SAT scores) identified by Eno, McLaughlin, Sheldon, and Brozovsky (1999) suggest that adjustments to admission procedures might help institutions select students who are likely to be successful in college. Specifically, admitting students based on previous academic success could assist with predicting future academic performance. College campuses that primarily emphasize standardized assessment scores or extracurricular activity involvement, for example, may not be considering previously established academic behaviors (e.g., literacy skills) that contribute to completing schoolwork and overall GPA. Final high school GPA may evidence academic skills, study habits, and motivation to complete necessary coursework. Thus, increased emphasis on applicants' high school records may be more telling of academic readiness for college expectations.

This study also hypothesized that identity commitment, academic commitment, and executive functioning would predict college GPA above and beyond previously identified variables. This hypothesis was not supported, indicating that identity commitment, academic commitment, and executive functioning, as a model, did not significantly predict cumulative GPA above and beyond high school GPA and other previously identified predictors. However, when executive functioning was included in a

model, excluding identity and academic commitment and high school GPA, it was found to significantly predict above and beyond other predictors.

Results of this study indicated commitment did not predict above and beyond other variables such as high school GPA, standardized assessment score, extracurricular activity involvement, parental income and education, and gender. Variable compounds observed in previously identified links between educational identity, academic commitment, and academic performance may explain the little predictive value of commitment in this study. For instance, the combination of commitment, stable decision-making, and problem-solving skills was related to academic success within educational identity (Berzonsky & Kuk, 2000), not commitment alone. Regarding academic commitment, the combination of commitment and investment was associated with time spent on studies, which is often associated with completing coursework (Human-Vogel & Rabe, 2015). Furthermore, Ahmadi, Zainalipour, and Rahmani (2013) found that a combination of commitment and expectations of developmental change within academia was required to predict academic achievement. Results indicating mixed effects of commitment suggest a confounding relationship between commitment and academic performance. Commitment to one's education, for example, may not indicate dedicated efforts toward all courses during a given semester. Committed academic behaviors may be prioritized for favored courses or courses that require vigorous efforts. Furthermore, commitment toward one's education may not necessarily imply commitment to studying or meeting course requirements (e.g., reviewing course material). Individuals may hold a

philosophical view of academic commitment, in which more emphasis is placed on discourse rather than actual academic behaviors such as dedicating time to study and/or reviewing notes for exams.

For commitment to influence academic performance in the college setting, other variables within identity and academic commitment may have been necessary. For example, an exploratory correlation analysis that included all identity and academic commitment variables indicated that investment ($r = .31$, $p < .01$), executive attention, ($r = .23$, $p < .05$), and executive planning ($r = .32$, $p < .05$) were significantly positively related to college GPA. See Table 10 for correlations between in-depth exploration, reconsideration of commitment, satisfaction, investment, quality of alternatives, executive attention, executive self-monitoring, executive planning, and cumulative GPA. Future research may want to investigate how other combinations of variables help predict academic performance in the college setting.

Table 10

Summary of Intercorrelations between Unaddressed Variables and CGPA (n = 113)

Measure	1	2	3	4	5	6	7	8	9	*n*
1. IE	1	-.14	.60**	.53**	-.30**	.15	-.13	.20*	-.01	113
2. RC		1	-.26**	-.26**	.47**	-.34**	.02	-.19*	-.15	113
3. S			1	.78**	-.36**	.37**	-.05	.29**	.09	113
4. I				1	-.26**	.42**	-.09	.36**	.31**	113
5. QA					1	-.33**	-.20*	-.14	-.12	113
6. EFA						1	.22*	.38**	.23*	112
7. EFSM							1	.23*	-.03	112
8. EFP								1	.32*	113
9. CGPA									1	111

** p < .05, two-tailed, ** p < .01, two-tailed*

Note: Other scales from the U-MICS: IE = In-depth Exploration, RC = Reconsideration of Commitment. Other scales from the ACS: S = Satisfaction, I = Investment, QA = Quality of Alternatives. Individual scales from the Amsterdam Executive Function Inventory: EFA = Executive Attention, EFSM = Executive Self-Monitoring, EFP = Executive Planning. CGPA = Cumulative Grade Point Average (Dependent Variable)

Given that executive functioning was a significant predictor of college GPA, participants who reported high attention, self-control and self-monitoring, and planning and initiative skills were more likely to have better academic performance than those with less executive functioning skills. These results correspond with previous research that has indicated predictive qualities of executive functioning. For example, Rhodes et al. (2014) found that planning and attention shifting were significant predictors of academic performance. Participants who were able to plan a set of behaviors and shift focus between stimuli performed better in the classroom. Moreover, Latzman, Elkovitch, Young, and Clark (2010) concluded that self-monitoring significantly predicted achievement in reading and social studies assessments. Participants who evidenced efficient lexical organization and strategic thinking while completing tasks outperformed their counterparts. Consistent findings indicating the influence of attention, self-monitoring, and planning suggest a fused relationship between executive functioning and academic performance. Students who are able to successfully attend to classroom directions and course syllabi, exercise self-control and monitor their workload, and plan to complete coursework may be at an advantage in the classroom. Executive functioning skills may allow students to more efficiently attenuate extraneous information (i.e., attention), manage their workload (i.e., self-control and self-monitoring), and develop a schedule for completing assignments (i.e., planning and initiative) that fosters academic achievement and helps reach one's academic potential.

Overall, the results of this study indicated, when excluding high school GPA, previously identified predictors were not identified as statistically significant predictors. High school GPA's mediating influence between identified predictors and college GPA is different from previous research. For example, the prediction value of standardized assessment scores (e.g., Kuncel, Hezlett, & Ones, 2001) and parental education (e.g., Anghel, 2015) may not be as widespread as previously conceived. Standardized assessment scores and/or other previous predictors may not be considering the influence of early-developed academic skills. For example, in a meta-analytic study, Robbins, Le, Davis, Lauver, and Langley (2004) found that among various psychosocial and study skill variables, academic goals (i.e., motivation to achieve success, completing tasks, and a drive for excellence) and academic-related skills (i.e., tools and abilities used to complete tasks, achieve goals, and manage academic work) were significantly related to GPA in higher education. This suggested that academic goals and skills developed early in education may be strong indicators of one's ability to adapt to more advanced academic work and persist when faced with academic adversity.

Participants from the 2-year and 4-year institutions were also compared to determine if academic performance was predicted differently. Results indicated that performance and non-performance variables did not predict college GPA across institutions. However, identity commitment and academic commitment reported by participants from 4-year institutions was approaching significance. This finding suggests a need for further studies with larger samples to determine if identity commitment and/or

academic commitment significantly predict college GPA in 4-year institutions. It may be that commitment variables reported by participants from 4-year institutions are related to academic performance.

The approaching prediction value of commitment has implications regarding experiential differences between institutions. Regarding identity commitment, exposure to diverse populations in conjunction with multiple opportunities for psychological, social, and emotional growth may contribute to changes in identity. The introduction to different political, religious, and gender-norm views (Campbell & Horowitz, 2015), observed by students attending 4-year institutions, may result in a change of identity commitment.

Regarding academic commitment, higher extracurricular activity and/or organizational opportunities provided by 4-year institutions may promote students' willingness to dedicate the necessary time and effort toward completing academic work (Strauss & Volkwein, 2002). Opportunities to become involved with a broad student body may lead to successful integration into the college setting and to stronger academic commitment that leads to performance. Academic commitment fostered by more opportunities for involvement provided at larger educational institutions mirrors previous conceptualizations of commitment. Sheard's (2009) notion of commitment, for example, pertains to a deep involvement in activities within a specified domain and viewing such domain as worthwhile and important despite the associated stress. In other words, students from 4-year institutions may express a deeply rooted connection with their

university, regardless of psychological, social, and/or academic adversities. Consequently, institutional involvement and overall educational opportunities may lead to stronger attachments, social support (Dennis, Phinney, & Chuateco, 2005), and academic commitment that promote academic achievement.

The significant differences between executive functioning and cumulative GPA across institutions has implications regarding early developed academic planning and college preparation. For example, early-acquired executive functioning abilities may be related to more efficient organization and time management skills that lead to better academic performance. This finding aligns with Willoughby, Blair, Wirth, and Greenberg (2012) who identified that executive functioning, specifically task switching and attentional control, corresponded with performance on math and reading standardized assessments in children that were 5 years of age. Furthermore, the significant difference between cumulative GPA across institutions may indicate the interplay of executive functioning and overall performance. Additional research is needed to examine the effects of executive functioning and academic performance across type of institution.

Limitations

Self-report instruments were utilized to measure all variables in this study. Due to known limitations of self-report measures, variables measured in this study may have been biased. Specifically, reported GPAs may have been inflated, understated, or incorrectly recalled. However, self-reported GPAs have been identified as reliable measures of academic performance. For instance, Noftle and Robins (2007) found that

self-reported GPAs and actual GPAs were significantly positively correlated. Recalling previous grades may closely align with actual academic performance. Nonetheless, additional research is needed to determine the connection between behavioral indicators and academic performance.

The sample size included for the purpose of this study comprised sophomore level students based on their recent college admission and existing college record. Analyses were restricted to this population because of the variables of interest. Standardized assessment score and cumulative GPA were the primary variables that permitted the selection of sophomore level students only. For example, although students from other classifications may have been able to report their standardized assessment scores, sophomore or freshman level students may have been more likely to accurately report their scores. Furthermore, with this filter considered, freshman level students do not have a cumulative GPA from a college setting. Hence, sophomore level students were the primary candidates for this study.

Missing values are worth noting, due to their potential effect on analyses. For example, of the sophomore level students, 24 data points within the standardized assessment score and 26 data points within the type of institution were missing. Missing data points can adversely affect statistical analyses, considering their impact on measures of central tendency, variability, and measures of standard error (Field, 2009). To address missing values, each variable was assessed for normality to identify improbable data points. Given that each variable was normally distributed, with the exception of slightly

skewed extracurricular activity involvement and academic commitment, it is appropriate to assume that each variable could be used within an inferential statistics framework.

The little predictive value of identity and academic commitment has implications regarding methods for measuring commitment. For example, the instruments used to measure identity and academic commitment may not have captured aspects of commitment that are connected to academic performance. The focal points of the instruments were 'education' and 'academic work', which may have been too vague to understand the relationship between commitment and academic related tasks. Identity and academic commitment may have been measuring constructs that were too broad for considering their relationship with actual school performance. Alternatively, identity commitment and academic commitment may have been too specific, resulting in a narrow measure of commitment and academic performance. Lastly, predictive qualities of commitment variables (e.g., Ahmadi, Zainalipour, & Rahmani, 2013) may not have been considering the influence of academic behaviors (e.g., literacy skills) and/or academic routines that contributed to academic success in the high school setting.

The relationship between high school GPA and college GPA suggests that similar factors may be influencing performance. The two GPAs may be measuring similar constructs due to the impact that early mastery of subject material, study skills, and strategies have on one's ability to perform in an academic setting. One's final high school GPA reflects a combination of factors that, when integrated, fosters the acquisition, fluency, and generalization of academic skills. Hence, the complexity of high school

GPA may undermine other individual variables that contribute to performance in the college setting. High school GPA may account for a combination of variables and take away from the influence of single factors that are related to academic performance (e.g., attendance) in higher education.

Future Research

Results from this study provide directions for future research. For example, behavioral components that are associated with non-performance variables (e.g., executive functioning) could be addressed in additional inquiries regarding academic performance. Measuring self-reported predictors in combination with behavioral indicators (e.g., attendance) may help understand the interplay between performance and non-performance behaviors.

The results of this study indicated that the selected variables accounted for 26% of the variance within cumulative GPA. The 74% of variance unaccounted for has implications about other variables not addressed in this study. For example, research that has identified personality variables (e.g., Metofe, Gardiner, Walker, & Wedlow, 2014), motivation (e.g., Sommer & Dumont, 2011), attendance (e.g., Arulampalam, Naylor, & Smith, 2010), course selection (e.g., Affendey, Paris, Mustapha, Sulaiman, & Muda, 2010), and other variables as predictors of academic performance suggests additional research that measures combinations of variables is warranted. Unaccounted for variance also suggests the impact of variables that have not been considered in the literature. Unaccounted for predictors have implications for decisions typically made by higher

education institutions. Admission decisions that emphasize standardized assessment scores and other performance variables may not be considering essential variables that account for the majority of the variance within college GPA. Future research that focuses on individual and combinatorial effects of internal and external variables would continue to help understand the complexity of academic performance.

The results of this study suggest variables other than previously identified predictors (e.g., standardized assessment scores) mostly contribute to academic performance. Regarding academic scholarship, this indicates that additional research is warranted to determine which variables are the most essential for acquiring academic skills necessary for the workplace. The shift observed within academic scholarship (i.e., academic exploration to job preparation) may also be occurring within the realm of predicting academic performance. Predictors may be shifting from pure performance or non-performance variables to a combination of performance and non-performance variables. Future efforts can address combination rather than individual variables to determine combinatorial effects on college level performance.

Lastly, future research should consider the use of more advanced statistical procedures to accurately identify important predictors such as decision trees. Although regression analyses help determine significant predictors, more advanced statistical procedures would help isolate individual or a combination of variables that predict academic performance. For example, Shade, Goga, Awodele, and Okolie (2013) indicated that utilizing decision tree algorithms might be a more accurate method for

identifying predictors. Data-mining procedures used within education may be able to help higher education institutions select students, create degree plans, and allocate resources and staff more efficiently.

Conclusions

- The results of this study indicated that commitment did not predict above and beyond previously identified predictors of cumulative GPA in the college setting. Therefore, commitment to school in combination with problem-solving skills, investment, and/or previous experiences within the academic environment may be necessary to influence academic performance.
- The results of this study also found that executive functioning significantly predicted academic performance. This suggests the impact of attention, self-monitoring and self-control, and planning and initiative on academic skills. Therefore, continued efforts addressing executive functioning skills in academic settings may be important for organization, critical thinking, computational skills, and other academic areas. Interventions specifically aimed at improving self-control, cognitive flexibility, planning, and working memory could lead to greater outcomes for individuals with poor executive functioning skills. Diamond and Lee (2011) indicated the following interventions could address executive functioning: computerized training (e.g., working memory training using computer games), aerobic exercise and sports (e.g., running, jump rope, basketball), and martial arts and mindfulness practices (e.g., practicing discipline, character development, meditation, and awareness of one's

environment). Diamond and Lee then concluded that those with poor executive functioning skills gain the most from training if their skills are continuously challenged and that there are still more interventions to be scientifically examined to determine their effect on executive functioning.

- The importance of high school GPA (e.g., Lavin, 1965) continues to hold merit when determining significant predictors of college-level performance. Furthermore, the mediating influence of high school GPA found in this study supports previous findings that have identified previous performance as the best predictor of future academic performance. For example, Belfield and Crosta (2012) found that high school GPA functioned as a mediating variable between the predictive qualities of standardized assessment scores and college performance. These results indicated that, when excluding high school GPA, standardized assessment scores had reduced explanatory power.
- The little predictive value of consistently supported predictors (i.e., standardized assessment scores) has implications for college admission procedures and suggests a need for additional research that targets the interplay between performance and non-performance variables.
- Due to the limited influence of previously identified predictors, this study found that non-performance variables continue to have an impact on academic performance. This suggests that previously identified latent constructs, such as personality (Conard, 2006) and self-discipline (Duckwork & Seligman, 2005), continue to affect

performance in the college setting. Spengler, Brunner, Martin, and Lüdtke (2016) recent finding that conscientiousness and openness to experience provided incremental predictive power toward academic performance, beyond intelligence and self-concept, indicates that non-performance variables continue to have an impact on contemporary education.

- The predictive quality of high school GPA indicates the impact of early educational experiences. This corresponds with Ramey and Ramey's (1998) discussion regarding educational development. They explained the following six mechanisms contribute to cognitive, social, and emotional changes: 1) encouragement to explore the environment, 2) mentoring in basic cognitive skills, 3) celebration of newly acquired skills, 4) rehearsal/expansion of new skills, 5) protection from inappropriate teasing/punishment, and 6) language stimulation. This suggests early educational experiences that promote these mechanisms may help shape academic skills that lead to successful performance across academic and occupational settings.

CHAPTER VI

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APPENDICES

Appendix A – Utrecht-Management of Identity Commitments Scale (U-MICS)

Appendix B – Academic Commitment Scale (ACS)

Appendix C – Amsterdam Executive Function Inventory (AEFI)

Appendix D – Demographic Information Sheet

Appendix E – Debriefing Form

Appendix A

Utrecht-Management of Identity Commitments Scale (U-MICS)

Instructions

Please rate each statement.

Response Categories:

Completely Untrue	Untrue	Sometimes True/ Sometimes Untrue	True	Completely True
1	2	3	4	5

1. My education gives me security in life.
2. My education gives me self-confidence.
3. My education makes me feel sure of myself.
4. My education gives me security for the future.
5. My education allows me to face the future with optimism.
6. I try to find out a lot about my education.
7. I often reflect on my education.
8. I make a lot of effort to keep finding out new things about my education.
9. I often try to find out what other people think about my education.
10. I often talk with other people about my education.
11. I often think it would be better to try to find a different education.
12. I often think that a different education would make my life more interesting.
13. In fact, I'm looking for a different education.

Appendix B

Academic Commitment Scale (ACS)

Instructions

Please rate each statement.

Response Categories:

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6

1.I want to continue with my academic work.
2.I believe in life-long learning.
3.I am determined to complete my academic work successfully.
4. I will persist with my academic work until I complete my degree.
5. I am not prepared to give up my academic work.
6. My academic work gives me a great deal of satisfaction.
7. I am very happy with my academic work.
8. Being able to complete academic work is close to ideal.
9. My academic work is fulfilling to me.
10. My academic work fulfills my needs for intellectual stimulation and intellectual interaction.
11. I enjoy completing academic work.
12. I feel content with my academic work.
13. I feel very involved in my academic work – very strongly linked to my academic work.
14. If I had a choice, I would rather do something other than complete academic work.
15. There are better things in life than my academic work.
16. Anything else would be better than having to complete academic work.
17. I feel very involved in my academic work – like I have put a great deal into it.
18. Compared to others I know, I have invested a great deal of time and effort in my academic work.
19. I spend a lot of time on my academic work.
20. I usually put a lot of effort into my academic work.
21. I do a lot to ensure success in my academic work.

Appendix C

Amsterdam Executive Function Inventory (AEFI)

Instructions

Please rate each statement.

Response Categories:

Not True	Partly True	True
1	2	3

1. I am not able to focus on the same topic for a long period of time.
2. I am easily distracted.
3. My thoughts easily wander.
4. I often react too fast. I've done or said something before it is my turn.
5. Compared to others, I talk a lot.
6. I do not consider the consequences before I act.
7. I am a blabbermouth.
8. I am well organized. For example, I am good at planning what I need to do during the day.
9. I am chaotic or disorganized.
10. My work is very tidy.

Demographic Information Form

Your demographic information will be stored and separated from other information you complete during this experiment and will not be linked with your responses in any way.

Please complete the following questions at the best of your ability.

1. What is your gender?
    a. Male
    b. Female
    c. Other _____

2. What is your age? _____

3. What is your race/ethnicity:
    a. White
    b. Black or African American
    c. American Indian or Alaska Native
    d. Hispanic or Latino
    e. Asian
    f. Native Hawaiian or Other Pacific Islander
    g. Other: _____

4. How many credit hours do you currently have? _____
    Example: 15 credit hours

5. How many credit hours are you currently taking? _____
    Example: 12 credit hours

6. What is your major? _____
    Examples: Art, Biology, Computer Science, Economics, Forestry, Psychology, Philosophy, Sociology, etc.

7. What was your final high school GPA? _____
    On a 4-point Scale
    Example: Final high school GPA = 3.0

8. What was your total score on the Scholastic Aptitude Test (SAT)? _____

Critical Reading Scores range from 200 – 800
Math Scores range from 200 – 800
Writing Scores range from 200 – 800
Example: SAT Total score of 1500 may indicate a score of 500 on the Critical Reading, Math, and Writing tests.

9. What was your composite score on the American College Test (ACT)? _____
   Composite scores range from 1 – 36
   Example: ACT Composite score = 20

10. What is the highest level of education your mother has completed?
    a. Some High School
    b. High School Diploma
    c. Some College
    d. Associate's Degree
    e. Bachelor's Degree
    f. Master's Degree
    g. Doctoral Degree

11. What is the highest level of education your father has completed?
    a. Some high school
    b. High School Diploma
    c. Some College
    d. Associate's Degree
    e. Bachelor's Degree
    f. Master's Degree
    g. Doctoral Degree

12. How many hours each week do you dedicate to extracurricular activities (clubs, athletics, etc.)? _____
    Example: 7 hours a week

13. What was your cumulative GPA for last year (i.e., 2014 Fall, 2015 Spring, and 2015 Summer)? _____
    On a 4-point Scale
    Example: Cumulative GPA = 3.0

14. What is your parent's income level?
    a. $0 – $14,999
    b. $15,000 – $24,999
    c. $25,000 – $34,999

d. $35,000 - $49,000
e. $50,000 +

15. Have you at any point received the Pell Grant through financial aid?
    a. Yes
    b. No

16. Are you currently employed?
    a. Yes
    b. No

17. You are currently attending a
    a. 4-year University
    b. 2-year Community College

18. You are attending a school in
    a. East Texas
    b. West Texas

Appendix E

Debriefing Form

Predicting Academic Performance: A Commitment Perspective

Experimenter: Frank Gomez

Email: gomezfe@jacks.sfasu.edu

Supervisor: Dr. Luis Aguerrevere (SFASU) (936) 468-1153, aguerrevele@sfasu.edu

Location: Stephen F. Austin State University

Thank you for participating in this experiment. Your participation may help us determine if previous school performance, individual habits, and commitment to one's education can help predict academic performance. The goal of this study was to determine if planning, working memory, and commitment variables would predict above and beyond previously identified predictors (e.g., standardized test scores). Overall, this study may help understand how academic performance is influenced by planning, working memory, and commitment, which could lead to the development of strategies for promoting academic-related behaviors.

I would like to thank you for your time and responses. If you would like any information in regard to this research project, you may contact Frank Gomez via email at gomezfe@jacks.sfasu.edu or my supervisor at Stephen F. Austin State University, Dr. Luis Aguerrevere via email, aguerrevele@sfasu.edu. All recorded information will be deidentified and be stored within the Qualtrics platform.

VITA

Frank E. Gomez was born in San Antonio, Texas on March 27, 1989. He graduated from John F. Kennedy High School in San Antonio, Texas in 2007 and in May of 2011, received a Bachelor of Arts degree in Psychology from the University of Texas at El Paso. Frank received a Master of Arts degree in Clinical Psychology from the University of Texas of the Permian Basin in 2013 and decided to continue toward a terminal degree at Stephen F. Austin State University. He worked as a Graduate Assistant from September 2011 until May 2013 at the University of Texas of the Permian Basin and from September 2013 until July 2016 at Stephen F. Austin State University. Frank received his Doctor of Philosophy degree in School Psychology in August of 2017.

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This dissertation was typed by Frank E. Gomez.