EMOTIONAL INTELLIGENCE AND THE 21ST CENTURY COLLEGE STUDENT:
USING EMOTIONAL INTELLIGENCE AS A STIMULUS FOR FIRST-YEAR
STUDENT RETENTION

by

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Emotional Intelligence and the 21st Century College Student: Using Emotional Intelligence as a Stimulus for First-Year Student Retention

Dissertation directed by Associate Professor Sylvia Mendez

The purpose of this quasi-experimental quantitative study is to examine whether emotional intelligence (EI) is a stimulus for first-year student persistence (enrollment in the following semester) utilizing the Bar-On (1997) EQ-i Higher Education assessment, which is a 133-question, likert-scale self-report assessment. A total of 250 first-year undergraduate students from various academic and demographic backgrounds participated in the study. Results yielded the subscale of Independence and Impulse Control as positive predictors of student persistence as evidenced in enrollment in the following semester. Utilizing the debrief as an intervention to predict the likelihood of retention had a negative treatment effect.
DEDICATION

As a first generation college student, I never imagined I would ever pursue a degree beyond the Bachelor's degree. However, I liked learning and continued to conquer additional degrees. Finding myself in an intensive doctoral program was never part of my master plan. I have since learned that my own self-efficacy is contingent on my erudition. As a mature student, I was unprepared for the rigor, self-discipline, and immense amount of time and energy required for this program.

Working full-time and being enrolled as a full-time Ph.D. student was nothing short of insane. The old adage that it takes a village to raise a child is true for a Ph.D. student as it takes a village to get a Ph.D. student through to completion. Let us not also forget the important role that stubbornness plays in this scenario.

As a result of surviving this program, I have learned more about our education system and for that, I am now a passionate activist for changing the system and an even greater advocate for the promotion and understanding of emotional intelligence. Learning more about emotional intelligence has also helped me, specifically in this program, as I have faced many challenges: multiple absences from my husband as an officer in the United States Army, the deaths of three very important people in my life, working full-time, encountering a difficult pregnancy, giving birth, post-partum depression, and having considerable challenges with some of my data. Emotional intelligence has taught me resilience, grit, better problem solving, and greater optimism.

In addition to greater emotional intelligence, having a village of people to support me throughout this process was invaluable in completing this program. My husband, family, friends, colleagues, directors, and students are the countless reasons I was able to
finish the program. After much thought, however, I dedicate my dissertation to my husband, Brendan and my daughter, Thea. My husband endured the force of my frustration throughout this program and I am grateful for his love and understanding. My daughter continues to put a smile on my face and fills my heart with joy every single day.
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I would like to thank my committee chair, Dr. Sylvia Mendez, for her patience, support, honesty, and guidance throughout the entire program, but especially the dissertation process. I would also like to thank Dr. Marcus Winters for his abundant tolerance of my wanting statistical skills and endless questions. I am grateful for his instruction and support throughout the program. Thank you also to Dr. Patricia Witkowsky for sitting on my committee and providing abundant knowledge of student development theory. I am also sincerely appreciative of Dr. Al Ramirez. He stepped in as a committee member replacement at the last minute and for that, I am grateful.

Working full-time and being enrolled in a full-time, intensive Ph.D. program is seemingly irrational and at many moments throughout the program, I thought I was foolish for doing it. However, I was fortunate to have the complete support and mentorship from my two directors, Dr. Constance Staley and the late Dr. Michael Hackman. They sustained me through my many self-doubt sessions, moody days, and often, complete emotional breakdowns. Additionally, none of my studies, including the study conducted for this dissertation, would have been possible without the academic, emotional, and financial support of Dr. Constance Staley, Director, Freshman Seminar Program, now Gateway Program Seminar. I am grateful for the support, mentorship, and development I have received from Dr. Staley as both supervisor and committee member. There are very few professional opportunities whereby one’s director provides the growth and development inherently necessary for success, but I have had that irreplaceable mentorship under Dr. Staley. It has been invaluable and something that I will continually carry with me.
Also, I would like to acknowledge the late Dr. Michael Hackman. We may be lucky to have one great supervisor in our lifetimes, but I had the pleasure of working for two phenomenal individuals and Dr. Michael Hackman was one of them. He gave me the autonomy to grow professionally and taught me many lessons in optimism and resilience. Unfortunately, after a four year, valiant fight against cancer, Dr. Hackman succumbed to the disease and was unable to witness the completion of this dissertation.

Completing anything in life is easier when you have the appropriate support. Without my committee chair, committee, and my directors this would not have been possible.
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CHAPTER 1

INTRODUCTION

Higher education continues to experience significant changes as it evolves into a 21st century mechanism that prepares a new generation of students to be productive and contributing members of society. Yet, a large number of current college students arrive on college campuses ill prepared academically, financially, and emotionally to be successful. At the same time, pressure to align college and university missions with increasing demands on student recruitment and retention is an arduous undertaking. Compounding the situation was President Obama’s 2013 declaration that any student wishing to attend an institution of higher learning should have the ability to access and attend those institutions. His declaration was without a clear understanding of student preparedness, as well as the realities of retention. With the increase of enrolled college students at institutions of higher education, the dynamics of student retention are changing rapidly and outpacing college and university resources. According to the National Center for Education Statistics, full-time enrollment in four-year higher education institutions increased by 15% between 1992 and 2002, 24% between 2002 and 2012, and enrollment is projected to continue to grow by 10% through the year 2024 (NCES, 2015). Total, full-time enrollment at four year degree granting institutions in 1992 was 14,487,359 and in 2015 was 20,234,000, not including part time student enrollments (NCES, 2015). As increasingly diverse populations of students attend college, with various academic, emotional, financial, and social needs, traditional academic student resources (e.g., academic advising, tutoring services, and first year
programs) are being complemented with non-cognitive resources, such as infusion of Emotional Intelligence (EI) practices, mental health counseling, and peer mentor programs that concentrate on non-academic student demands.

In President Obama's 2014 State of the Union address, he discussed the White House's College Opportunity Summit whereby, “150 universities, businesses, and nonprofits have made concrete commitments to reduce inequality in access to higher education and to help every hardworking kid go to college and succeed when they get to campus” (Obama, 2014). However, fulfilling this desire is an onerous task when not all students are prepared for higher education. With presidential encouragement to make higher education more attainable and affordable for any student anticipating attendance, colleges and universities are re-evaluating their admissions processes, retention strategies, and what it means for their students to be successful.

According to the NCES (2015), the national graduation rate for first-year students (first-time, full-time freshmen) in 2013 at four-year, public institutions was 58% while retention of first-year students between the years 2006 and 2012 ranged between 78-79% (NCES, 2015). This is based on a six-year graduation rate. There is a 20% gap between graduation and retention, which is an indication that some first-year students take longer than six years to graduate or they do not graduate at all. The impetus to use graduation rates as a measurement of student success is a result of pressure from Congress to make institutions of higher education more accountable and transparent, especially for low-income students and students who otherwise have lower access to higher education (Quaye & Harper, 2014).
Higher education institutions across the country are searching for multiple approaches, both cognitive and non-cognitive, in an effort to help retain students. As researchers begin to research more non-cognitive approaches to personal growth (EI, grit, resilience, perseverance) versus cognitive growth (IQ and other traditionally academic traits), one can argue that seeking alternative and non-cognitive ways to develop first-year students’ persistence is of paramount importance to increasing overall student success. Colleges and universities are expending institutional capital to influence student success by teaching first-year students how to manage their time, organize their courses and subsequent course work, and other additional academic skills so it is not surprising there is more interest in non-cognitive skill development, notably EI (Parker & Duffy, 2005). Student success is an all-encompassing term for retention, academic achievement, and graduation rates.

There is significant debate in the literature over the term “non-cognitive” and how researchers can measure such attributes (Duckworth & Yeager, 2015). Despite the debate, researchers appear to agree that non-cognitive attributes are an important facet of student cognitive growth and development, but continue to doubt the reliability of some of the methods of measurement (Duckworth & Yeager, 2015). One such way to determine non-cognitive functioning is assessing first-year students’ EI, with the Bar-On EQ-i® for Higher Education within the first semester of college. The most current definition of EI is as follows, EI is “a set of emotional and social skills that influence the way we perceive and express ourselves, develop and maintain social relationships, cope with challenges, and use emotional information in an effective and meaningful way” (Romero-Ternero, 2013, p. 63). Students who understand their emotions and those that
can effectively manage their emotions may have the skills necessary to perform better academically and to be better socially prepared, thus remaining at their home institutions until completion of their degree. With increasing financial burdens and other implications for first-year students, having greater EI may help first-year students transition more successfully into college. College is more than passing tests and graduating; it is an experience that develops the whole student. An institution’s failure to acknowledge the multiple challenges students’ face as they transition into and through college will lead to increased student departure (Parker & Duffy, 2005).

**EI and its Association with Student Success**

There is a significant amount of literature surrounding EI, what it is, and what it can do for individual success and well-being. EI is highly recognized in the professional realm. Its visibility is a result of Daniel Goleman’s 2005 book *Emotional Intelligence*, which brought the term EI into the mainstream. Goleman’s book is designed to help working professionals understand and manage their EI in order to be more successful in their jobs. EI is also used in many other settings including organizational psychology, human resources management, training and development, and education (Stough, Saklofske, & Parker, 2009). As the success of EI grows and is applied in different settings, EI has grown in popularity in educational settings. Rather than continue to focus on academic (cognitive) interventions to improve overall retention rates, institutions of higher education have the opportunity to assess students’ EI as a non-cognitive measure to improve their success. EI is the way we perceive, manage, and regulate our emotions and how we use emotional information to understand others (Bar-On, 1997; Bar-On & Parker, 2000; Bar-On, 2006; Durek & Gordon, 2006; Mayer, Caruso, & Salovey, 2000;
Mayer, Caruso, & Salovey, 2004; Multi-Health Systems, 2011; Romero-Ternero, 2013; Singh & Sharma, 2012; Stein & Book, 2006; Stein, Book, & Kanoy, 2013). Although there is significant research on EI in various contexts, notably professional settings and leadership, the concentration here will be on higher education. The main premise of this dissertation is to explore the potential relationship between EI and first-year student persistence (retention to the following semester). Retention is a focus because it is a measure all institutions of higher education use.

**Purpose of this Research**

The purpose of this quasi-experimental, quantitative study is to explore whether EI is associated with first-year student persistence by looking at students’ enrollment in their second semester. Traditionally, retention is measured from fall to fall, but for the purposes of this study, it was measured from fall to spring. EI was measured using the EQ-i® Higher Education assessment (Bar-On, 1997). Additionally, individual subscale scores were measured in an effort to determine if these scores influenced their retention to the following semester. Whether a student met with a coach for an EQ-i® debrief was also reviewed to determine if the coaching debrief had any impact on students’ retention.

This study sought to determine results based on the following four research questions:

- **RQ1**: Is a student’s overall EI score associated with student retention?
- **RQ2**: Is a student’s domain scores associated with student retention?
- **RQ3**: Is a student’s subscale scores associated with student retention?
- **RQ4**: Does meeting for the EQ-i® debrief influence student retention?
EQ-i® Assessment

Much of the growing body of EI research utilizes the Bar-On (1997) EQ-i® Higher Education assessment, a 133-item self-report inventory based on five specific EI domains and corresponding subscales: Intrapersonal (Self-regard, Emotional Self-Expression, Assertiveness, Independence, Self-Actualization), Interpersonal (Empathy, Social Responsibility, Interpersonal Relationship), Stress Management (Stress Tolerance, Impulse Control), Adaptability (Reality Testing, Flexibility), and General Mood (Optimism, Happiness). Multi-Health Systems, Inc. (MHS, Inc.) is the Toronto-based organization responsible for the assessment. Please see figure 1 for a more comprehensive explanation of the EQ-i® domains and subscales.
### Bar-On Model of Domains of EI

**IntRApersonal Realm** concerns what we generally refer to as the “inner self.” It determines how in touch with your feelings you are, and how good you feel about yourself and about what you’re doing in life. Successes in this area mean that you are able to express your feelings, live and work independently, and have confidence in expressing your ideas and beliefs. Subscales include:

- **Self-Regard** - The ability to respect and accept oneself as basically good.
- **Emotional Self-Awareness** - The ability to recognize one’s feelings.
- **Assertiveness** - The ability to express feelings, beliefs and thoughts and defend one’s rights in a non-destructive manner.
- **Independence** - The ability to be self-directed and self-controlled.
- **Self-Actualization** - The ability to realize one’s potential capacity.

**Stress Management** concerns the ability to withstand stress without caving in, falling apart, or losing control. Success in this area means that you are usually calm, rarely impulsive and cope well under pressure. In school, these skills are vital if you customarily face deadlines and tight demands. Subscales include:

- **Stress Tolerance** - The ability to withstand adverse events and stressful situations by actively and positively coping with stress.
- **Impulse Control** - The ability to resist or delay an impulse, drive, or temptation to act.

**IntERpersonal Realm** concerns what are known as people skills. Those who function well in this area tend to be responsible and dependable. They understand, interact with and relate to others in a variety of situations. They inspire trust and function well as part of a group. Subscales include:

- **Empathy** - The ability to be aware of, understand, and appreciate the feelings of others.
- **Social Responsibility** - The ability to demonstrate oneself as cooperative, contributing, and a constructive member of one’s social group.
- **Interpersonal Relationship** - The ability to establish and maintain mutually satisfying relationships that are characterized by intimacy and by giving and receiving affection.

**Adaptability** concerns the ability to size up and respond to a wide range of difficult situations. Success in this area means that you can grasp problems and devise effective solutions, deal with and resolve personal issues and meet conflicts within your social group. Subscales include:

- **Reality Testing** - The ability to assess the correspondence between what is expected and what objectively exists.
- **Flexibility** - The ability to adjust one’s emotions, thoughts, and behaviors to changing situations and conditions.
- **Problem Solving** - The ability to identify and define problems as well as to generate and implement potentially effective solutions.

**General Mood** concerns your overall outlook on life, your ability to enjoy yourself and others and your overall feelings of contentment or dissatisfaction. Subscales include:

- **Optimism** - The ability to look at the brighter side of life.
- **Happiness** - The ability to feel satisfied with one’s life, to enjoy oneself and others, and to have fun.

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*Figure 1.* Chart is adapted (with permission) from page 3 of the MHS, Inc. Student Comprehensive Report, Bar-On (1997).
In the intrapersonal domain, students are assessed on their confidence, whether they understand their own emotions, whether they can express their feelings in a constructive manner, and whether they can make self-directed decisions without having emotional dependency on another individual. In the interpersonal domain, students are assessed on their ability to empathize and understand someone else’s emotions, establish and maintain relationships, and whether students can demonstrate collaboration and cooperation. The stress management domain assesses students’ ability to cope with stressful situations and whether students can delay or resist the impulse to act. The adaptability domain seeks to determine students’ skills at adapting their thoughts and feelings to changing situations, their ability to problem solve and find effective solutions to problems, and students’ objectivity within their environment. The final domain of general mood assesses students’ overall well-being and whether students are able to find something positive when all else seems negative. It also assesses students’ contentedness with their current life situation.

Context: Non-Cognitive Student Pressures

If the premise of higher education is to retain students and assure that all students are academically successful, then institutions of higher education need to focus on other retention strategies that involve non-cognitive attributes, not only the ability to take and pass a test. “Non-cognitive factors refer to skills and disposition toward learning, as opposed to academic ability or performance” (Atkins-Burnett, Fernandez, Akers, Jacobson, & Smither-Wulsin, 2012, p. 1).

Many students struggle with the transition from high school into their first year of college as evidenced by the proliferation of first year programs and seminars (Pemzadian
& Credé 2016; DeAngelo, 2014). Financial burdens, mental health issues, and new academic expectations all can impact students’ retention. Students can become overwhelmed in a new academic setting along with a new living arrangement. Residence life, dormitory culture, new friends, new instructors, and being homesick are some additional non-cognitive stressors impacting students’ progress and transition. Assessing first-year student EI may help colleges and universities plan and implement alternative methods to encourage persistence and ultimately, retention.

One issue facing many higher education institutions is the increasing cost of recruiting and retaining students. As higher education institutions are confronted with the impetus to be more accessible, institutions of higher education are more enrollment-driven than they have been in the past. This challenge has increased over the past two decades in part due to increased labor costs, shrinking endowments, building maintenance, and the 2008 recession. As a result, colleges and universities have increased tuition costs, plaguing students with increased tuition and fees, increased student loan procurement, and over-burdened financial aid (Braxton, Hirschy, & McClendon, 2011; Doyle & Zumeta, 2014; Fowles, 2014; Manik, 2014; Selingo, 2013). This increased financial pressure negatively impacts students already experiencing a difficult transition into higher education. In the last decade, higher education costs have steadily increased, funding from national and state governments has plummeted, and the burden of colleges and universities to meet their budget needs has some institutions of higher education struggling to provide a quality education for their students (Altbach, Gumport, & Berdahl, 2011; Braxton, Hirschy, & McClendon, 2011; Doyle & Zumeta,
Bound, declared,

The result is a higher-education system in financial crisis, with an urgent need
for radical change in order to serve the next generation of college students—or, in
some cases, simply to survive…and at the center of this disruption is a perfect
storm of financial, political, demographic, and technological forces (p. 58)

Institutions of higher education struggle with the financial complexities that are
an issue on most college campuses. With fewer federal and state dollars, many
institutions are tuition-driven. As such, there is a case for greater student admissions
acceptance, even for students who may not be academically prepared for the rigor of
college coursework. In addition to the lack of appropriations for higher education,
federal and state governments have also passed legislation to bind student outcomes to
funding (Christensen & Eyring, 2011). Most recently, the Colorado Commission on
Higher Education (CCHE) passed HB 14-1319, essentially tied state funding to a higher
education institution’s graduation and retention rates (Colorado Higher Education
Commission, 2014). HB 14-1319 represents a national trend and not one that is exclusive
to Colorado. With the evidentiary funding pressures and concurrent legislative pressures,
higher education institutions are continuing efforts to find creative and reliable ways to
retain students, specifically first-year students.

Although many institutions of higher education have programs in place to assist
students who struggle academically, these same institutions are underprepared for the
non-cognitive issues that students are bringing with them to campus. Non-cognitive
issues such as financial pressures, academic inequities in K-12, and social/emotional
differences are inherently part of this generation of students. From an outsider’s perspective, it is not surprising there appears to be an increased need to provide academic services for academic inequities, but not necessarily for the social/emotional or non-cognitive differences.

The financial obligations of higher education institutions impact the process of education, but so does the heterogeneity of student populations. With more higher education institutions opening their doors to fulfill access and enrollment-driven budgetary demands, more are inevitably increasing enrollment while concurrently attempting to also provide a quality higher education (Norcini & Banda, 2010; Selingo, 2013). Higher education has an increasingly heterogeneous student population with varying needs (Christensen & Eyring, 2011; Manik, 2014; Ravitch, 2011). Students arrive at their higher education destination with academic deficiencies, diagnosed mental illnesses, physical and learning disabilities, financial pressures, family struggles, and a multitude of other non-cognitive problems that may affect students’ abilities to persist academically, socially, or emotionally to the following semester (Ravitch, 2011). Institutions are finding that in order to meet students’ needs, they need to increase the number of faculty and staff to meet the strains of their growing student populations (Reynolds, 2013). Student health centers, counseling centers, peer mentor programs, tutoring centers, and first-year seminar courses are all ways in which many institutions are attempting to meet the needs of their students, faculty, and staff while trying to remain within the confines of their budgets.
Significance of the Study

Aside from the fiscal and legislative pressures expressed earlier, higher education institutions have refocused their efforts on retention programs because most first-year students are likely to leave their higher education institutions between their first and second year and other students are likely to leave their college or university without completing a degree program (Habley, Bloom, Robbins, & Robbins, 2012; Nordstrom, Swenson, Goguen, & Hiester, 2014; Selingo, 2013; Tinto, 1993). Student retention is a popular theme in academic literature. According to DeAngelo (2014), retention research began in the 1980s, and this research field has increased over the last 30 years as is visible with first-year course curricula such as the first-year seminar and other first-year student interventions (e.g., required academic advising, tutoring centers, etc.). Tinto (1993) further noted that a significant number of students depart their higher education institution after their first semester. Tinto’s model of student retention is one that focuses on student interaction with their institutions, which is similar to student development theories like those of by Alexander W. Astin, Ernest T. Pascarella, and Patrick T. Terenzini.

This study utilized the Bar-On Emotional Quotient Higher Education assessment as a new and focused aspect of student development, one that could be employed as a way to retain students and help students learn more about themselves in order to facilitate an easier transition into higher education. As students elected to mee: for an EQ-i® debrief, based on their individual results, they have the opportunity to develop greater self-efficacy and additional ways to manage and develop their individual EI.
Although it is difficult to statistically link causality of non-cognitive attributes like EI to first-year student retention, it is important to at least consider it as a contributing factor in helping students transition successfully into college (Parker, Duffy, Wood, Bond, & Hogan, 2005). Singh and Sharma (2012) agreed, “A growing body of research has found a wide range of important life outcomes that are not adequately predicted by traditional measure of cognitive intelligence but can be predicted by EI” (p. 107). Singh and Sharma, along with other researchers, are seeking other measures of non-cognitive intelligence and many have gravitated toward the concept of EI. This shared concept is one that concludes student success cannot be defined by cognitive intelligence alone (Al Asmari, 2014; Berenson, Boyles, & Weaver, 2008; Jaeger & Eagan, 2007; Song, Huang, Peng, Law, Wong, & Chen, 2010; Van der Zee, Thijs, & Schakel, 2002). Most researchers agree that students who are able to manage their emotions are able to persist and raise their levels of academic achievement because they have an awareness of their ability to manage the pressures of an academic atmosphere (e.g., test anxiety, fear of failure, and low confidence in oneself).

Colleges and universities know first-year students struggle with this transition, balancing financial burdens, mental health issues, and new academic and social expectations which influence students’ likelihood for success in higher education. If EI does influence first-year student persistence, higher education institutions may want to consider assessing students’ EI in an effort to determine how well students may be able to perform and also determine ways in which institutions can plan and implement academic and other alternative methods to encourage student persistence, achievement, retention, graduation, and ultimately, institutional success.
CHAPTER 2

REVIEW OF LITERATURE

Applying student development theories as the framework for college student retention is representative of the nature of the developmental transition that college students attempt to cope with their first semester. The adolescent transitional process from high school to college is a fundamental progression into adulthood (Astin, 1973; Astin, 1975; Astin 1997; Astin, 1999; Newton & Ender, 2010; Nordstrom, Swenson Goguen, & Hiester, 2014; Pascarella & Terenzini, 2005; Poulou, 2014; Tinto, 1993). According to Chickering and Reisser’s (1993) “Seven Vectors of Change,” students need to fulfill or master specific skills related to each phase of the maturation process (Autonomy, Competence, EI, Integrity, Interpersonal Relationships, Purpose/Philosophy of Life, and Self-Identity). Skill development and knowledge acquisition are both key components of student development.

With increased encouragement to enroll in higher education institutions, there is no shortage of research on the positive effects of a university education. There are economic, personal, and societal benefits to higher education attainment, especially for underrepresented populations (Abel & Dietz, 2012; Angrist & Krueger, 1991; Baum, Ma & Payea, 2013; Crellin, Kelly, & Prince, 2012; Haut, 2012; Hensley, Galilee-Belfer, & Lee, 2013; Pascarella & Terenzini, 2005; Tinto, 2012). However, with increased enrollments, there is also increasing pressure to retain students through to graduation. Student development theories support the necessity for retention programs because they provide a necessary framework for faculty, staff, and education researchers to design
retention solutions. Astin’s student development theory, originally developed and published in 1968, claimed that student involvement is a result of the amount of effort or work a student chooses to allocate to their individual scholastic endeavors (Astin, 1999). Astin wrote at length about his student involvement theory and conducted many studies on the benefits of student involvement, for example, students who live in residence halls, join a club or organization on campus, and work on campus are more likely to be retained (Astin, 1973, 1975, 1997, 1999). Astin also wrote about students’ active participation in the classroom versus what he referred to as the “passive role” students adopt in the learning process, which he opined was the result of “faculty members adhering to the subject matter theory of learning” (Astin, 1984, p. 520). Tinto has continually developed his theory and in his 2012 book, Completing College: Rethinking Institutional Action, he said there is not one specific recipe for retaining students, but did mention that institutions need to meet “four specific conditions” if they want to retain their students: “expectations, support, assessment and feedback, and involvement” (p. 114). His original framework emphasized the need for student involvement, but his most recent considerations included a more holistic and all-encompassing approach to also include classroom and faculty engagement.

Students’ learning environment is paramount in how they interpret and construct their own development. Winne and Nesbit (2010), both education psychologists, postulated a more nuanced approach to academic achievement by researching how students learn and also how they use the information received as a result of their environment. More broadly, there are new approaches to learning in the field of educational psychology, which may directly impact educational practitioners’ views on
student persistence and success. "Manipulating instructional conditions and accommodating trait-like individual differences or social differences" (Winne & Nesbit, 2010, p. 671) are viewed as competing competencies, though both could be considered simultaneously in student outcomes. The learning environment is considered the contextual learning environment for students and how the learning environment impacts students' success and learning perspectives (Goh & Fraser, 1998; Oskal, Tekkaya, Cakiroglu, & Sungur, 2009). Building on Astin's and Tinto's student development and student involvement theories, one must also consider the self-constructivist and self-efficacy theories as they are also suitable frameworks in student development and thus should be considered when seeking retention solutions.

As higher education institutions seek to employ different strategies to maintain enrollment and close the retention gap, understanding how students learn and construct knowledge is important to any retention and student success strategy. Self-constructivist and self-efficacy frameworks are crucial in helping institutions to consider other views of student development in an effort to build upon how students learn and grasp the reasons a student persists in task development and ultimately task success (Bandura, 1971; Bandura, 1977; Bandura, 1993; Bandura & Schunk, 1983; Gergen, 1985; Schulman, 1985). Bandura (1986) firmly asserted that student self-efficacy was correlated to student persistence and success. In a 2001 longitudinal study of 373 first-year students, student self-efficacy was studied to determine its influence on retention and success (Chermers, Hu, & Garcia, 2001). End-of-quarter and end-of-year cumulative GPA measured academic success. Chermers, Hu, and Garcia (2001) concluded that academic self-efficacy (confidence in one’s academic abilities) and optimism contributed to students’
persistence and academic success. As indicated in Chickering and Reisser’s (1993), “Seven Vectors of Change,” EI was considered a skill that was necessary in student development. If we are to view EI as a skill, which the Bar-On EQ-i® assessment does, students’ self-efficacy is also important in helping students understand how their EI can affect their learning and also how to construct their EI in an effort to increase student retention and ultimately, student success.

**EI and Its Increasing Popularity**

In 2014, EI appeared to be trending and gaining more traction in the social sciences and also social media. Twitter, Facebook, LinkedIn, and other social media sources continue to push out articles on EI and there is also a growing body of academic research on EI. Resources regarding EI are now easily accessible and its importance across multiple disciplines is also evident in the literature. Two decades ago, EI was a new theme escalating in academic literature, but as shown in Figure 2, the discussion and concept of EI has been around for over a century (Bar-Or, 2005; Bar-On & Parker, 2000; Durek & Gordon, 2006; Stein & Book, 2006; Stein, Book, & Kanoy, 2013). Figure 2 is a historical map of the EI timeline.
Historical Map of Emotional Intelligence

Charles Darwin (1870)
Wrote about the role of emotional expression

Edward Thorndike (1920)
Gained the term “social intelligence”

David Wechsler (1940)
First to suggest inclusion of “non-cognitive” factors in IQ measurement

R. W. Leeper (1942)
Promoted idea of “emotional thought” alongside rational thought.

Albert Ellis (1955)
Explored Rational Emotive Behavioral Therapy

Howard Gardner (1983)
Wrote about “multiple intelligences” including “personal intelligence”

Reuven Bar-On (1986)
Created the term Emotional Quotient or “EQ”
Created the Emotional Quotient Inventory or EQ-I (1997)
EQ-I is an assessment with predictive validity

Peter Salovey & John Mayer (1990)
Conceptualized the term Emotional Intelligence (EI)
With David Caruso, created the only ability-based EI test, the MSCEIT
MSCEIT is an ability-based test of emotional intelligence

Daniel Goleman (1996)
Brought Emotional Intelligence into the mainstream with his book “Emotional Intelligence: Why It Can Matter More Than IQ”
Created the Emotional Social Competence Inventory (ESCI) with Richard Boyatzis and the Boy Group

K. V. Petrides (1998)
Trait Emotional Intelligence
Created the TESI as an instrument to measure trait EI

Figure 2. Informative data from Bar-On, 2005; Bar-On & Parker, 2000; Durek & Gordon, 2006; Stein & Book, 2006; Stein, Book, & Kanoy, 2013.

Conceptually, EI stemmed from Charles Darwin. He was the first scientist to mention anything related to emotion by writing about emotional expression in The Origin of Species (1859). Edward Thorndike (1920), a psychologist, created the term “social intelligence,” which included theories of emotion. David Wechsler’s (1939) research
was significant in the history of EI because he was the first psychologist to encourage and suggest that non-cognitive factors, like emotion, be considered when assessing IQ. This is paramount as many psychologists today argue that EI is not a construct of intelligence because it cannot be tested in a way that accounts for longitudinal or other environmental influences. More recently, Howard Gardner (1983) researched and wrote about theories of multiple intelligences including personal intelligence, which is the precursor of EI.

Models of Emotional Intelligence

There is significant data on the various models used to measure EI. There are four different instruments most often applied in academic studies relating to undergraduate students. Please see Table 1 for a review of the four major EI instruments. Some studies use one particular assessment or they use a combination. Depending on the researcher’s methodology, one assessment may be used or all could be used.
Table 1

**Most Widely Used EI Assessments**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Assessment</th>
<th>Measure</th>
<th>Constructs</th>
<th>Best Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar-On, Reuven</td>
<td>EQ-i®</td>
<td>133 Question Self-Report Inventory</td>
<td>Intrapersonal, Interpersonal, Stress Management, Adaptability, Mood</td>
<td>College Students</td>
</tr>
<tr>
<td>Goleman, Daniel</td>
<td>ESCI</td>
<td>360-Degree Assessment, Multi-rater</td>
<td>Self-Awareness, Self-Management, Social Awareness, Relationship Management</td>
<td>Business and Other Professionals</td>
</tr>
<tr>
<td>Salovey, Peter; Mayer, John; Caruso, David</td>
<td>MSCEIT™</td>
<td>141 Question Self-Report Inventory</td>
<td>Perceiving emotions, using emotion to facilitate thought, understanding emotions, and managing emotions</td>
<td>High School and College Students</td>
</tr>
</tbody>
</table>

*Note: Informative data from Bar-On, 2005; Bar-On & Parker, 2000; London Psychometric Laboratory, 2011; Mayer, Caruso, & Salovey, 2000; Mayer, Salovey, Caruso, & Sitarenios, 2003; Petrides & Furnham, 2001; Petrides, Pita, & Kokkinaki, 2007.*
Bar-On EQ-i®

Reuven Bar-On coined the term “Emotional Quotient” while writing his dissertation in 1988 and went on to create the first EI assessment, which he sold to MHS, Inc. in 1997 (now the Bar-On EQ-i®). Multi-Health Systems, Inc., a Toronto-based company, continues to manage and administer the EQ-i® instrument. The Bar-On EQ-i® is a 133 question, self-report inventory that assesses students’ EI based on the following five main domains: intrapersonal, interpersonal, stress management, adaptability, and mood (Bar-On, 2005; Bar-On & Parker, 2000). Within the five domains, students also assess themselves on their self-regard, emotional self-awareness, assertiveness, independence, self-actualization, empathy, social responsibility, interpersonal relationship, stress tolerance, impulse control, reality testing, flexibility, problem solving, optimism, and happiness (Bar-On, 2005; Bar-On & Parker, 2000). Reuven Bar-On also created a multi-rater version of the EQ-i® (or 360 degree assessment) in 2003 with Richard Handley. However, this version is geared towards working professionals.

MSCEIT™

Psychologists, Peter Salovey and John Mayer were the first researchers to conceptualize the term “EI.” With the assistance and research of David Caruso, Peter Salovey and John Mayer created the first ability-based test of EI called the MSCEIT™, also managed and administered through MHS, Inc. The MSCEIT™ is a 141 self-report inventory that seeks to test students’ ability to perceive emotions, use emotions to facilitate thought, understand emotions, and manage emotions (Mayer, Caruso, & Salovey, 2000; Mayer, Salovey, Caruso, & Sitarenios, 2003). Psychologists entrenched
in cognitive theories of intelligence consider intelligence to be fixed and therefore, can only be determined by sound and well-researched cognitive testing (e.g., IQ testing). Mayer, Salovey, and Caruso developed the ability-based model to test, not assess, EI.

ESCI

Daniel Goleman is an author and researcher who helped to mainstream EI in his 1995 book *Emotional Intelligence*. Goleman uses EI in a more professional and leadership capacity. Much of his research and published books are aimed at bringing EI into the workplace, helping to enhance and improve professional success. He, too, has an EI instrument, geared towards professionals, that assesses social competencies. He enlisted the help of a consulting firm, The Hay Group, and fellow psychologist Richard Boyatzis, to create the ESCI, Emotional Social Competence Inventory. The ESCI is housed and administered by the Hay Group, in Philadelphia, Pennsylvania. The ESCI is a multi-rater, 360-degree assessment that seeks to assess individuals on their self-awareness, self-management, social awareness, and relationship management. Individuals are assessed on these constructs, but also receive input and feedback from colleagues, supervisors, peers, and subordinates. In 2014, Goleman and his fellow researchers recently published ESCI-U, which is a multi-rater, 360-degree assessment for college students. Due to the newness of this particular assessment, it has not been used extensively and there is limited data in the scholarly literature on the assessment.

TEIQusc®

Lastly, K.V. Petrides and Adrian Fuhrman, British psychologists, research trait EI in adolescents. Trait EI seeks to determine how well individuals perceive the emotions of others (Petrides & Furnham, 2001; Petrides, Pita, & Kokkinaki, 2007). Petrides and
Fuhrman are the creators of the TEIQue©, an instrument used to measure trait EI and the instrument is still governed by Petrides, but managed and administered through the London Psychometric Laboratory at University College London. The TEIQue© is a 153 question, self-report inventory that seeks to assess the following: adaptability, assertiveness, emotion perception, emotion expression, emotion management and regulation, impulsiveness, relationships, self-esteem, trait empathy, trait happiness, and trait optimism (London Psychometric Laboratory, 2011). Although the TEIQue© is not widely used, it does exist in the literature and bears mentioning in the lineage of EI.

**EI and Student Retention**

As the popularity of EI grows in multiple sectors of academe and business, so too does the possibility that EI supports student self-efficacy, growth, and student success. Awareness of non-cognitive factors can prove invaluable to post-secondary institutions that seek to lower the attrition rates of students and may aid in the creation of programs to better assist students who struggle to adjust to collegiate life. These programs include transitional programs, like mentoring programs, and freshmen seminar programs—general attention to actively incorporating students into college life through curricular and co-curricular activities that increase students’ EI are imperative to increasing retention rates (Astin, 1999; Balduf, 2009; Naylor, Wooldridge & Lyles, 2014). Researchers are suggesting that interventions include curricular adjustments and activities that incorporate EI, such as including teaching interventions and EI coaching (Banks, 2013; Carthy, McCann, McGilloway, & McGuiness, 2013; Pool & Qualter, 2012; Qualter, et al., 2009; Safari, Jafary, & Baranovich, 2014).
An imperative of most institutions of higher learning is to provide as much student assistance as possible once the student is identified as struggling or even after the semester is over and the student has failed. In one study, an effort to reduce student absences in class, Kearney and Graczyk (2013) followed the Response to Intervention (RtI) model, which subscribed to early identification and treatment measures rather than a reactionary response found at most institutions of higher education. Intervention programs utilizing theories of EI, like that of Banks (2013) and Carthy et al. (2013) include helping students define what EI is and how it affects their overall well being and potential success. Carthy et al. (2013) and Martinez, Arnold, Erjavec, & Lopez (2013) are two studies that stand out in the literature for their EI intervention and discussion of the EQ-i® debrief.

Predictive validity of the EQ-i® assessment is useful in student retention and student success endeavors and in many studies, revealed positive and often statistically significant correlations with academic success (Austin et al., 2005; Dawda & Hart, 2000; Durek et al, 2006; DiFabio & Palazzeschi, 2009; Emmerling & Goleman, 2003; Jaeger, 2003; Parker et al., 2004, 2005, 2006). As indicated by Carthy et al. (2013), it was difficult to require students to meet with a coach for an EQ-i® debrief, which takes 30-60 minutes to complete, but the end result of having a facilitated debrief is providing the opportunity for students to understand EI and how it can help them in their academic endeavors and improve their overall well being. Explaining students’ results in a manner that makes sense to them, helping them understand their emotions and the emotions of others, appears to have a strong impact on the student. This would align with Astin’s (1984) theory of student development as the EQ-i® debrief provides students an active
role in the learning process. Martinez et al. (2013) found that of the students who completed the assessment and met with an EQ-i® coach for a debrief, 87% persisted to the following semester versus the 60% who did not meet with a coach. Coaching is said to positively contribute to a student's improvement of similar EI factors like self-awareness, self-regulation, and overall welfare (Richman, Rademacher, & Maitland, 2014). In another study, Willis (2014), too, debriefed all participating study respondents and found that GPA, ACT composite score, and the EI subscale of Social Responsibility were all positive and statistically significant predictors of student success and retention.

**EI and Student Academic Success**

Literature on student academic success subscribes to the view that students with higher EI are more self-assured and transition through college with a greater degree of academic success (Afolabi, Ogunmwonyi, & Okediji, 2009; Parker, Summerfeldt, Hogan & Majeski, 2004; Parker, Creque, Barnhart, Harris, Majeski, Wood, Bond & Hogan, 2004; Parker, Duffy, Wood, Bond, & Hogan, 2005; Van der Zee, Thijs, & Schakel, 2002). Keefer, Parker, and Wood (2012), in their study of undergraduate students, compared grade point average, age, and course load of students and found that low EI was associated with a greater likelihood of degree non-completion when compared to students that possess a higher level of EI. Higher levels of EI are said to help students cope and adjust to the changing expectations within the higher education environment, especially with the initial transition between high school and the first semester of college (Keefer, Parker, & Wood, 2012; Parker, Summerfeldt, Hogan & Majeski, 2004; Parker, Creque, Barnhart, Harris, Majeski, Wood, Bond & Hogan, 2004).
EI skills include decision-making, empathy, interpersonal skills, stress tolerance, and flexibility (to name a few) and all are significant skills, especially in professional preparation and work for future nurses. For example, Rankin’s (2013) study included 307 nursing applicants, which he followed in a longitudinal study. He concluded that EI skills were significant in predicting academic performance and retention. Again, there was no causal linkage, but the predictive validity of EI and success was evident in his research outcomes.

Some researchers are also beginning to view selection criteria differently, especially in the area of nursing pre-licensure (Cherry, Fletcher, O’Sullivan, & Shaw, 2012; Codier & Odell, 2014; Fernandez, Salamonson & Griffiths, 2012; Jones-Shenk & Harper, 2014; Karimi, Cheng, Bartram, Leggat & Sarkeshik, 2014; Mahmoud, El-Dayem, & Mousa, 2013; Rankin, 2013). Nursing and other professional programs are seeking to develop alternative, non-cognitive learning practices to measure nursing student success in the academic arena and the professional sphere that extends beyond college.

Fernandes et al. (2012) found that EI was a significant predictor of academic achievement and significantly correlated with critical thinking with the 81 graduate nursing students who participated in the study. The researchers concluded that the nursing students’ awareness and understanding of their own emotions played a significant role in their academic success. Although the sample size was small and causality cannot be generalized to a broader population, the results of the study bear significance in adding to the current EI research. Codier and Odell (2014) sought to measure EI ability and nursing students’ GPA. They determined that there was some suggestion of a
relationship between EI and GPA. What Codier and Odell (2014) noted was group mean
EI scores were average, although 18% of individual students’ scores were below average,
thus suggested further research on EI as it relates to academic achievement. Mega,
Ronconi, and De Beni (2014) conducted a study with 5,805 undergraduate students at one
public university and found that emotions influence learning and motivation, thus
influencing how well students achieve academically.

What is notable about this research is the inclusion of non-cognitive variables in
education. Although the aforementioned studies discussed nursing students in particular,
the desired outcomes of academic success and retention are the same. There is
evidentiary information that supports additional research on EI skills and undergraduates
as well as the possibility for EI skill learning and instruction in undergraduate education.

Traditional methods of student success have been based on IQ or academic
progress alone. Admissions criteria are historically based on GPA, ACT, and SAT,
although no single standardized measure is used as a cut off for acceptance. It is clear
that IQ continues to account for a substantial percentage of students’ academic success.
However, it is equally clear that there are other variables, like EI, that need consideration
(Downey, Lomas, Billings, Hansen, & Stough, 2014). As standardized testing is still
pervasive in the college admissions and recruiting processes (e.g., requiring ACT scores,
SAT scores, or both), Levin (2013) called for inclusion of non-cognitive characteristics in
both domestic and international standardized testing, citing that education outcomes need
to account for non-cognitive qualities as they impact student development. Again,
researchers are beginning to advocate for additional measures in standardized testing, not
simply relying on math, English, science, and social studies measures.
EI and Undergraduate Student Stress

Mental health issues, stress, and emotional well-being are considered non-cognitive factors that influence academic persistence and success (Bryant & Malone, 2015; Karimi, et. al., 2014; Perrault, Mask, Morgan & Blanchard, 2014; Nordstrom, Swenson Goguen, & Hiester, 2014; Pascarella & Terenzini, 2005). The transition from high school to college is said to cause immense stress for many students, which is an impediment to student emotional self-regulation (Duckworth & Seligman, 2005; Mega, Ronconi, & De Beni, 2014). Bryant and Malone (2015) surveyed 124 business students in the Rocky Mountain Region and found a relationship between stress and emotional expression. First-year students are faced with a host of new challenges that impact their stress levels, which attribute to stress, self-esteem, and student outcomes (Hamarta, 2009, McCabe, Blankenstein, & Mills, 1999). It has been suggested that strong levels of EI suggest a greater likelihood of students' ability to manage their emotions and is an integral part of student psychological function and overall mental health (Jones-Shenk & Harper, 2014; Ruiz-Aranda, Castillo, Salguero, Cabello, Fernandez-Berrocal, & Balluerka, 2012;). Houghton, Wu, Godwin, Neck, and Manz (2012) support this view and also suggested that the ability to manage and interpret one's emotional processes is a key component of EI. Morales (2008) suggested that EI is a central component of an individual's resilience and is a precursor to determining how students cope with academic stress. Further, he said a student who has demonstrated high EI exhibits the ability to (a) self-motivate and persist when challenged and frustrated, (b) control impulses and selfish indulgence, (c) regulate mood and keep distress from clouding the ability to think, and (d) be compassionate and hopeful (Morales, 2008).
The inability to deal with stress compounds mental health issues and thus impacts students' success at the collegiate level. As student enrollments increase, there will also be a corresponding mental health increase in student issues. In a 2012 report from the National Alliance on Mental Illness (NAMI), university students indicated that 73% of them experienced a mental health crisis during their tenure at their specific college or university. The list of triggers that students expressed as the stimulus for their mental health crisis included "feelings of anxiety, panic, depression about school and life, difficulty adjusting to a new routine and environment, and feelings of homesickness, loneliness, isolation, and medications not working" (NAMI, 2012, p. 17). According to the report, 27% of students reported coming to college with a diagnosis of depression, followed by 24% who had been diagnosed with bipolar disorder, the two largest concentrations of diagnoses (NAMI, 2012, p. 7). Eisenberg, Hunt, and Speer (2013) also recognized the increase in mental health issues on college campuses, and found significant correlations between mental illness and student relationship status, living in residence halls, and student finances. In the Eisenberg et al. 2013 study of 14,000 undergraduate and graduate students, the students were screened for multiple mental health illnesses and the results indicated 17% of all students had depression, followed by generalized anxiety at 7%, and 6% had suicidal ideation.

In the 2014 Higher Education Research Institute (HERI) report on The American Freshman: National Norms Fall 2014, freshmen self-reported to what degree their emotional health had declined since high school and to the degree in which they felt depressed. According to the report, 50.7% of the 153,105 participating freshmen
indicated they felt depressed or determined that their overall mental health had declined, rather significantly.

Additional studies in the literature support these mental health claims. Ciarrochi and Scott (2006) recruited first-year psychology students from an Australian university to measure students' emotional competence and well-being. Using a longitudinal design, students with lower problem solving skills predicted higher incidences of student stress, anxiety, and in some cases, depression. Students who were not able to express their emotions effectively and constructively were more likely to have increased anxiety (Ciarrochi & Scott, 2006). Pritchard and Wilson (2003) reported that students with higher levels of stress had lower GPAs and an inability to cope, which ultimately led to students' departure from the university. Students with higher levels of stress and lower levels of EI were found to have difficulty coping with the demands of a new academic setting emphasizing the need for additional emotional regulation in the academic environment (Saklofske et al., 2007; Saklofske et al., 2012). Hen and Goroshit (2014) found that learning disabled students with a lower level of EI had higher incidences of stress, anxiety, and physical illnesses, which increased the students' habits of procrastination compared to students without learning disabilities. It is important for educators to understand EI and its relation to disabled students as not all students will self-identify as learning disabled in college.

For more serious mental health issues, Aradilla-Herrero, Tomás-Sábado, and Gómez-Benito (2014) and Kwok (2013) found depression, compounded with decreased emotional regulation, to be significant predictors of suicidal ideation. Although EI and student persistence are the premise of this dissertation, one must also consider the
cognitive implications of mental illness and its relation to EI. There is not anything expressly evident in the literature, but there is a nonverbal understanding that none of the specific EI instruments are designed to diagnose any mental illness. However, some of the EI constructs may allude to emotional issues that correlate to mental illness. With the increase in mental health issues on college campuses (NAMI, 2012; Eisenberg, Hunt & Speer, 2013), an EI assessment of first-year students may prove useful in helping higher education institutions deliver necessary services (counseling, health center, etc.) in a manner that is proactive versus reactionary.

It is therefore not surprising that researchers are beginning to link EI and social well-being with incidences of mental health issues on college campuses and this directly impacts a student’s ability to adjust, cope, persist, and be academically successful (Barriball, Fitzpatrick & Roberts, 2011; Ciarrochi & Scott, 2006; Nightingale et al., 2013; Pechtel & Pizzagalli, 2011; Saklofske, Austin, Galloway & Davidson, 2007; Saklofske, Austin, Mastoras, Beatin & Osborne, 2012; Suldo, Gormley, DuPaul & Anderson-Butcher, 2014).

The Complexity of EI

EI and its relationship to retention and academic success factors is complex to understand and measure with validity and reliability across students. Some researchers, however, have found little or no correlation between EI and measures of academic success (Bastian, 2005; Barchard, K. A., 2003; James, 2014; Maddi, Erwin, Carmody, Villarreal, White and Gundersen, 2013; Newsome, Day, & Catano, 1999; O’Connor and Little, 2003), while others have found lower than expected EI scores for college students, leading to the possibility that students entering college do not have sufficient life
experiences to facilitate EI (Leedy & Smith, 2012). Devi and Narayanamma’s 2014 study did not find any correlation between EI and the academic performance of 177 engineering students. However, they found that gender did influence EI skills.

The numerous EI studies involving college students used various methods of measurement. Nowack (2012) reported that the multiple models of EI that are commonly recognized in the literature further complicate EI results. There are at least four different models based on (a) personality, (b) competency, (c) ability, and (d) trait (Nowack, 2012). Accordingly, there are a variety of instruments used to measure EI and the emotional and social competencies for each of the four models. Some of the measurements do not overlap with one another, while some appear to assess similar or identical aspects of this broad concept (Nowack, 2012). EI measured within different theoretical models, like those above, can yield different EI results. The many inconsistencies that appear to exist in the EI and student success literature could be the result of varying sampling and the researchers’ decisions on which variables to include in those studies (Parker et. al., 2006). Thus, contradictory findings of the role of EI in academic success exist throughout the literature (Parker, Summerfeldt, Hogan, & Majeski, 2004).

**Conclusion**

Theories of EI have focused on the “whole” student, to include reasoning capabilities, creativity, emotions, and interpersonal skills (Afolabi, Ogunmwonyi, & Okediji, 2009; Friedlander, Reid, Shupak, & Cribbie, 2007; Kerr, Johnson, Gans, & Krumrine, 2004; Ridgell & Lounsbury, 2004; Tao, Dong, Pratt, Hunsberger, & Pancer, 2000). Additionally, Pritchard and Wilson (2003) suggested that when institutions fail to
give attention to EI and only focus on cognitive matters, they miss students who depart from college for non-academic reasons. Many institutions are struggling with retention initiatives. There are freshman seminar programs, peer mentor programs, tutoring programs, financial aid and scholarship programs, but most rely on the premise of how the student fairs mainly in the academic realm, not taking into account the whole student perspective. This is relevant to research examining the effects of EI on academic success as greater adjustment problems were found in those who struggle to identify their emotional reactions (Ruiz-Aranda, Castillo, Salguero, Cabello, Fernandez-Berrocal, & Balluerka, 2012; Krostseg, 1992; Nightingale, Roberts, Tariq, Appleby, Barnes, Harris, Dacre-Pool & Qualter, 2013; Rickinson & Rutherford, 1995; Saklofske, Austin, Mastoras, Beaton & Osborne, 2012; Salovey, Mayer, Goldman, Turvey, & Palfai, 2002). Sparkman, Maulding, and Roberts (2012) suggested that more research is needed to determine the effects of EI on education and the use of EI in the practices of higher education. Educators owe it to themselves and their students to further explore the role it plays as empirical evidence continues to challenge the age-old idea that cognitive ability alone is solely responsible for academic success.
CHAPTER 3

METHODOLOGY

The purpose of this quasi-experimental, quantitative study is to explore whether EI influenced first-year student retention. Student retention and success are widely covered subject areas in education literature. EI, as it relates to first-year student retention, is an emergent theme in current research. First-year students not only have cognitive issues that may influence their persistence to the following semester and ultimate academic success, but their issues also stem from non-cognitive issues like those assessed in the EQ-i® for higher education such as: self-regard, emotional self-awareness, assertiveness, independence, self-actualization, empathy, social responsibility, interpersonal relationship, stress tolerance, impulse control, reality testing, flexibility, problem solving, optimism, and happiness (Bar-On, 2005; Bar-On & Parker, 2000).

Academic achievement of first-year students requires effort, conscious control of individual impulses, and the ability to manage emotions to attain short and long-term goals (Ivcevic & Brackett, 2014). Not all students are resilient, and they appear to have limited retention (to the following semester). Significant focus has been placed on cognitive strategies of retention (e.g., academic advising, tutoring, etc.), but not enough placed on non-cognitive strategies such as developing students’ EI.

This study sought to determine results based on the following four research questions:

RQ1: Is a student’s overall EI score associated with student retention?

RQ2: Is a student’s domain scores associated with student retention?
RQ3: Is a student's subscale scores associated with student retention?

RQ4: Does meeting for the EQ-i® debrief influence student retention?

For research questions one, two, and three, a binary logistic regression was performed to determine whether the overall EI score or the domain and subscale scores are associated with a student's retention from fall to the spring semester. Finally, propensity score matching was used for research question four, which determined whether meeting for an EI coaching debrief had any impact on a students' second semester retention.

Research Site

This study was conducted at a public university in Colorado. The university is categorized as a mixed residential-commuter campus and is one of the fastest growing institutions in the country. The student body includes nearly 26% of students of color and an almost equal female-to-male ratio. Additionally, 32% of students are eligible for Federal Pell Grants. A total of 50% of students at this university receive federal student loans with 76% of the students receiving some form of financial aid.

EQ-i® Assessment

The EQ-i® assessment was selected for use in this study based upon its reliability, validity, and the existing research that supports its use. According to the Bar-On Emotional Quotient Inventory (EQ-i®) for Higher Education, students' overall EQ-i® scale score between 60 and 89 is considered low and requires enrichment; the range of 90-119 notes effective functioning; and scale scores between 120 and 150 indicate enhanced functioning (Bar-On, 1997a; Bar-On, 1997b; Bar-On, 2006). After completing the assessment, students receive an overall EQ-i® score and they also receive individual domain and subscale scores from the 133-item self-report inventory. The five specified
EI domains and corresponding subscales are: Intrapersonal (Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, Self-Actualization), Interpersonal (Empathy, Social Responsibility, Interpersonal Relationships), Stress Management (Stress Tolerance, Impulse Control), Adaptability (Reality Testing, Flexibility, Problem Solving), and General Mood (Optimism, Happiness). MHS, Inc. provides certified EQ-i® coaches with a Counselor’s/Coaches report, a Student Comprehensive Report, and a Student Summary. The EQ-i® remains one of the primary methods of assessing EI and has been recognized as a valuable tool in assessing an individual’s ability to succeed academically (Bar-On, 1997; Bar-On, 2006; Dawda & Hart, 2000; Martinez et al., 2013; Parker et. al., 2004). Lastly, the Bar-On EQ-i® is the only assessment of its kind included in The Buros 19th Mental Measurements Yearbook (Bar-On, 2006; Carlson, Geisinger, & Jonson, 2014), thereby demonstrating its extensive review and credibility for use.

**Procedures**

In 2014 and 2016, the research site’s Institutional Review Board granted approval for the investigator to pursue this study with a sample of first-year students enrolled in a Freshman Seminar and/or Academic Fitness course (Appendix A). Both courses are specifically designed for entering first-year students between the ages of 18 and 24, with less than 30 transferable credit hours and housed within the university’s College of Letters, Arts, and Sciences. All first-year students are required to take a Freshman Seminar, but students may elect to enroll in Academic Fitness. However, students who are on academic probation in the College of Letters, Arts, and Sciences and have a cumulative GPA of 1.9 or lower, are required to enroll in an Academic Fitness course.
Having students from both populations increased the cross-section of the student population to include pre-majors, undecided students, conditional admitances, students on probation, honors students, and students who had already declared a major. Students in Academic Fitness were offered 50 extra credit points to participate in the study. Students in the Freshman Seminar course were not offered extra credit (Appendix B).

The Freshman Seminar course, a required, three-credit first-year course, is designed to help students navigate the transition into a higher education institution. Each seminar topic is unique and interdisciplinary and students can freely choose which freshman seminar course they wish to take. Academic Fitness is a 1-credit course designed to enrich students’ college success skills. It is not remediation, but an exploratory course based on individual students’ learning styles. Topics such as learning styles, time management, study skills, writing development, and major/career selections are explored in the course.

Students in both courses were asked to complete the consent form, complete the EQ-i® assessment (with a link emailed to them and administered through Multi-Health Systems, Inc.), and they were invited to participate in a debriefing session with a certified EQ-i® coach. The purpose of the EI debrief is to review the EI results with the student and help guide the student to connect for himself or herself how the EI domains and subscales fit together as they learn about their EI strengths and areas for enrichment. The debrief sessions combined advising and coaching techniques with the student in an effort to coach the student in ways they can change their learned EI behaviors to increase their overall EI and find balance within their EI domains. According to the Bar-On EQ-i®, EI is considered a skill, whereby an individual has the ability to adapt or change behavior to
increase success (Stough, Saklofske, & Parker, 2009). Essentially, EI is developed over time. In each debrief, students are coached on their current measures of EI and are offered a development plan. Whether they choose to work with the coach on the development plan is up to the student. There were four certified EQ-i® coaches that completed all of the debrief sessions. Certified coaches are trained to approach each debrief similarly based on the training model by MHS, Inc. Demographic information was compiled by the institution’s Institutional Research office. The assessment was administered between August 18, 2014 and November 1, 2014.

Although the EQ-i® debrief was not mandatory, it is a significant part of the EQ-i® process. Students are coached to understand what EI is, what the EQ-i® assessment is, and what the students’ results mean overall, but more importantly, how the results can translate into more enhanced emotional skills. The effort is to coach students to have a better understanding of their emotional skills when understanding their own and others’ emotions.

Sample

A total of 311 first-year students completed the assessment. However, 61 students did not turn in their consent forms, which left a sample of 250 first-year students (total number of first-year students for fall 2014 was 1,666). Table 2 shows descriptive statistics on the sample.
### Table 2

**Descriptive Statistics of the Sample**

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index Score</td>
<td>93.54</td>
<td>39.30</td>
</tr>
<tr>
<td>Total Credits Completed in Fall 2014</td>
<td>13.99</td>
<td>1.95</td>
</tr>
<tr>
<td>ACT Total Score</td>
<td>22.99</td>
<td>4.03</td>
</tr>
<tr>
<td>High School GPA</td>
<td>3.25</td>
<td>0.74</td>
</tr>
<tr>
<td>Met for EQ-i® Debrief</td>
<td>0.34</td>
<td>0.48</td>
</tr>
<tr>
<td>State Not Colorado</td>
<td>0.12</td>
<td>0.33</td>
</tr>
<tr>
<td>Gender - Female</td>
<td>0.69</td>
<td>0.46</td>
</tr>
<tr>
<td>White</td>
<td>0.76</td>
<td>0.43</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.10</td>
<td>0.31</td>
</tr>
<tr>
<td>Black</td>
<td>0.06</td>
<td>0.25</td>
</tr>
<tr>
<td>Asian</td>
<td>0.06</td>
<td>0.24</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>American Indian</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Enrolled Spring 2015 Semester</td>
<td>0.93</td>
<td>0.26</td>
</tr>
<tr>
<td>Age</td>
<td>18.21</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Overall, the average age of the students in the sample was 18 and the average index score was 94. Colorado four-year institutions use an index score in the admissions process, though it is not the sole criterion for college admission. The index score is calculated using a quantitative combination of a student’s high school GPA, rank, and SAT/ACT score (Colorado Department of Education, 2014). There is collinearity between the index score and SAT/ACT scores as the latter are included in the calculation of the index score.

The average student completed a total of 14 credits for fall 2014, 88% were from Colorado, 69% were female, and the average ACT score in the study sample was 23 (with a range of 21-25). Only 34% of the students in the sample opted to meet with an EQ-i® coach for an EQ-i® debrief. There was limited racial diversity in the sample as 76% of the students self-identified as white, 10% Hispanic, 6% Black, and 6% Asian.
The study sample race/ethnicity is similar to the average for the university. According to IPEDS data 2013-2014, based on a first-year population of 1,618, 68% of the university student population is White, 13% Hispanic, 4% Black, and 3% Asian. However, the study’s gender average was not indicative of the averages for the university. Female representation was 20% higher than the university’s average.

**Study Variables**

The outcome variable for this study was retention, defined as the students’ continued enrollment in the spring 2015 semester. Although fall-to-fall is the standard measurement for retention, this study measured fall-to-spring enrollment as a result of budgetary and time constraints. Of the students who completed the EQ-i® assessment, the overall retention rate for spring 2015 was 93% compared to the overall freshman class retention rate of 87%.

**Explanatory Variable: EQ-i®**

The primary explanatory variable of interest is the overall EQ-i® score, which is provided by the assessment. The computer generated raw scores are changed into standard scores with a mean of 100 and a standard deviation of 15 (Bar-On, 2006). Additionally, scores are provided for each of the five main domains and each dimension contained within those domains. Descriptive data of the EQ-i® scores, domains, and dimensions are included in Table 3. Overall, students’ EQ-i® score averaged 93, which puts them, on average, at the lower end of the scale for effective functioning.
Table 3

EQ-i® Scores

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total EQ-i® Score</strong></td>
<td>93.05</td>
<td>14.16</td>
</tr>
<tr>
<td><strong>Intrapersonal Domain Score</strong></td>
<td>93.78</td>
<td>15.40</td>
</tr>
<tr>
<td>Self-Regard</td>
<td>97.36</td>
<td>16.31</td>
</tr>
<tr>
<td>Emotional Self-Awareness</td>
<td>95.62</td>
<td>15.38</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>97.48</td>
<td>15.37</td>
</tr>
<tr>
<td>Independence</td>
<td>88.82</td>
<td>15.02</td>
</tr>
<tr>
<td>Self-Actualization</td>
<td>99.18</td>
<td>14.96</td>
</tr>
<tr>
<td><strong>Interpersonal Domain Score</strong></td>
<td>99.22</td>
<td>14.16</td>
</tr>
<tr>
<td>Empathy</td>
<td>99.26</td>
<td>14.78</td>
</tr>
<tr>
<td>Social Responsibility</td>
<td>99.68</td>
<td>13.64</td>
</tr>
<tr>
<td>Interpersonal Relationships</td>
<td>99.56</td>
<td>14.60</td>
</tr>
<tr>
<td><strong>Stress Management Domain Score</strong></td>
<td>96.00</td>
<td>13.67</td>
</tr>
<tr>
<td>Stress Tolerance</td>
<td>92.97</td>
<td>15.54</td>
</tr>
<tr>
<td>Impulse Control</td>
<td>98.85</td>
<td>14.42</td>
</tr>
<tr>
<td><strong>Adaptability Domain Score</strong></td>
<td>90.50</td>
<td>14.01</td>
</tr>
<tr>
<td>Reality Testing</td>
<td>88.70</td>
<td>14.87</td>
</tr>
<tr>
<td>Flexibility</td>
<td>95.17</td>
<td>15.27</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>93.16</td>
<td>14.19</td>
</tr>
<tr>
<td><strong>General Mood Domain Score</strong></td>
<td>98.36</td>
<td>14.65</td>
</tr>
<tr>
<td>Optimism</td>
<td>93.72</td>
<td>14.93</td>
</tr>
<tr>
<td>Happiness</td>
<td>102.42</td>
<td>14.79</td>
</tr>
</tbody>
</table>

Other Independent Variables

A number of additional independent variables previously found to be predictors of retention and success in other studies were also included in this study (Carthy et. al., 2013; Dawda & Hart, 2000; Durek et. al, 2006; Emmerling & Goleman, 2003; Jaeger, 2003; Jaeger & Eagan, 2007; Keefer, Parker, & Wood, 2012; Parker, Duffy, Wood, Bond, & Hogan, 2005; Parker, Hogan, Eastabrook, Oke & Wood, 2006; Saklofske et al., 2012). Some of these variables included high school GPA, number of credits enrolled for fall 2014, index score, ACT scores, gender, ethnicity, and state of residence.
Statistical Analysis

For research questions one, two, and three, a binary logistic regression was performed to determine whether the overall EI score or the domain and subscale scores are associated with a student’s retention to the spring semester. Additionally, an ordinary least squares regression was performed to determine if there were any relationships in the data that were eliminated with additional controls. Finally, propensity score matching was used for research question four to determine whether meeting for an EI coaching debrief had any impact on a students’ second semester retention.

Binary logistic regression is a particular example of a generalized linear model; it allows the researcher to calculate the likelihood/odds of a dichotomous dependent variable using the most parsimonious model (Menard, 2001). Ordinary least squares is a particular example of a linear regression model with a dependent variable that is either 0 or 1; whereby the probability of observing a 0 or 1 is dependent on one or more of the independent variables (Aldrich and Nelson, 1995). In both cases, “retention to the next semester of college” versus “departure” is formulated from a set of independent variables that do not have to be normally distributed, linearly related, or of equal variance. A description of the steps using a binary regression and ordinary least squares regression equations are below:

\[ \text{Equation 1 – Binary Logistic Regression Equation} \]

\[ \logit \pi_i = x_i \beta_i + \varepsilon \]

Where:

- \( \pi_i \) = linear function of covariates (probability of being retained)
- \( x_i \) = vector of covariates
- \( \beta_i \) = vector of regression coefficients
$X_i =$ independent variables

$\varepsilon =$ error term

*Equation 2 – Ordinary Least Squares Regression Equation*

$$Y = \alpha + \beta_1 X_1 + \varepsilon$$

Where:

- $Y =$ Student Enrollment in Spring 2015 Semester
- $\alpha =$ intercept
- $\beta_1 =$ coefficients of the independent variables
- $X_1 =$ independent variables
- $\varepsilon =$ error term

The current study also utilized propensity score matching to produce an unbiased estimate of a treatment effect on an outcome variable, thus enhancing the validity of causal inferences (Dehejia & Wahba, 2002; Rosenbaum & Rubin, 1985). Participating in an EQ-i® debrief serves as the treatment variable. Students self-selected to meet with an EQ-i® coach for a debrief. Each student in the study was offered a coaching session once they completed the assessment. There were several covariates used to determine whether or not a student enrolled for the 2015 spring semester, see Table 4. Propensity score matching is a procedure that uses a series of observed characteristics to match observations of those who received a treatment (EQ-i® debrief) to similar individuals who did not receive the treatment (Dehejia, & Wahba, 2002). However, propensity score matching cannot eliminate all bias.
Table 4

*Variable List for the Study*

<table>
<thead>
<tr>
<th>TREATMENT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ-i® Debrief Yes</td>
</tr>
<tr>
<td>EQ-i® Debrief No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COVARIATES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index Score</td>
</tr>
<tr>
<td>Total Number of Fall Credits</td>
</tr>
<tr>
<td>ACT Score</td>
</tr>
<tr>
<td>High School GPA</td>
</tr>
<tr>
<td>State</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>Pacific Islander</td>
</tr>
<tr>
<td>Native American</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Total EQ-i® Score</td>
</tr>
<tr>
<td>EQ-i® Domain Scores</td>
</tr>
<tr>
<td>EQ-i® Subscale Scores</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTCOME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolled Spring 2015</td>
</tr>
</tbody>
</table>

In an effort to account for both the observed and unobserved differences, the propensity score is estimated via probit to determine the conditional probability of receiving the treatment given pre-treatment characteristics. A description of the steps using the propensity score equation is below:
Equation 3 – Propensity Score Matching Equation

$$TREAT = \alpha_0 + \alpha_1 X + \varepsilon$$

Where: \(TREAT\) = whether a student received an EQ-i® debrief and
\(X\) = all variables relating to student characteristics
\(\varepsilon\) = error term

Once the propensity score is estimated, and has passed the balancing test, then the estimated propensity score will be used to match cases with similar scores of those who were treated and those that were not treated.

To determine the best technique for matching, four common matching techniques were employed to determine the best fit (matching each subject to its counterfactual on propensity score): nearest neighbor, radius, kernel, and stratification. Each of the four common matching techniques were employed because there is limited information in the literature that directs the researcher to use one technique over another and at best, researchers run each technique to determine the best fit for their specific dataset (Baser, 2006). All four matching techniques were run and yielded similar results. The nearest neighbor matching technique was selected for use in the equation. Equation 4 is as follows:

Equation 4 – Estimated Propensity Score Equation

$$\text{Retention to Spring 2015 Semester} = \beta_0 + \beta_1 TREAT + \varepsilon$$
Study Limitations

Although the sample size is robust at 250, we were unable to embed the IRB consent form within the assessment itself, which would have helped to increase the number of cases. It was difficult to physically obtain consent forms from the students as outlined in the IRB protocol. Students were also invited to meet with an EQ-i® coach to review the results of the assessment and answer any questions the student had in regards to the assessment. An outcome of the student debriefs, despite issues with scheduling and finding time to take the assessment, students revealed that they felt the assessment was accurate and useful. Many students valued the ability to gain a better understanding of their behaviors as they related it to academics. Although the instrument is statistically valid and reliable, it is impossible to control for student fidelity in completing the assessment.

Additionally, the costs of administering and debriefing the Bar-On EQ-i® can be prohibitive when factoring in the assessment cost and the need for EQ-i® certified coaches to provide the debriefing sessions. For this study, the 1997 Bar-On EQ-i® was used. At the time of the study, it was the only version of the assessment that could provide scored datasets. In 2015, scored datasets were released with the 2012 Bar-On EQ-i® 2.0, the updated, re-normed version of the Bar-On EQ-i®. Costs are the same for both versions of the assessments. Additionally, measuring student retention from fall to spring semester, versus fall to fall was a limitation. Lastly, the design of the study is not as robust as it could have been. A randomized field trial could have been performed with more diligence on the part of the principal investigator. However, the benefits far offset
the costs, given the potential for aiding in students' understanding of their EI strengths, areas for development, and the effect of EI on their academic success and retention.
CHAPTER 4

RESULTS

The results of this study are divided into four sections, (a) sample, (b) instrument and reliability, (c) assumptions, and (d) analysis. SPSS v22.0 was used for all descriptive and regression analyses; STATA 14.0 was used for the propensity score matching analysis. All inferential analyses were tested at the 95% level of significance.

The premise of this study was to determine whether EI influences first-year student retention, as indicated by a student’s enrollment from fall 2014 to the spring 2015. The four research questions addressed in this study were as follows:

RQ1: Is a student’s overall EI score associated with student retention?

RQ2: Is a student’s domain scores associated with student retention?

RQ3: Is a student’s subscale scores associated with student retention?

RQ4: Does meeting for the EQ-i® debrief influence student retention?

Sample

A total of 311 records were originally collected for this study. The participants of this study included first-year students who were enrolled at a public university in Colorado. All participants were required to complete a consent form in order to participate in this study. However, 61 participants did not submit their consent forms. Therefore, the total sample size for this study was 250. Table 5 presents the frequencies and percentages of the descriptive variables of the study, as well as the dichotomous variable of EQ-i® debrief, which was used as the dependent variable in the propensity score matching analysis. Table 6 presents measures of central tendency for the continuous variables of the study.
A large portion of the population was female (68.8%), while a much smaller portion of the population was male (31.2%). The majority of participants were white (76%). The percentage of students in the state of Colorado (88%) was much higher than the percentage of students from out of state (12%). About two-thirds of the population was not debriefed on the EQ-i® instrument (65.6%), and the remaining one-third of the population was debriefed (34.4%). Almost all of the students were enrolled in the spring 2015 semester (92.8%), and a much smaller percentage of students were not enrolled in the spring 2015 semester (7.2%).

Table 5

*Frequency Counts and Percentages of Descriptive Variables of Study (N=250)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>78</td>
<td>31.2</td>
</tr>
<tr>
<td>Female</td>
<td>172</td>
<td>68.8</td>
</tr>
<tr>
<td>Ethnic Group</td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>190</td>
<td>76.0</td>
</tr>
<tr>
<td>Hispanic</td>
<td>26</td>
<td>10.4</td>
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<tr>
<td>Black</td>
<td>16</td>
<td>6.4</td>
</tr>
<tr>
<td>Asian</td>
<td>14</td>
<td>5.6</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Native American</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>State</td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Out of state</td>
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<td>12.0</td>
</tr>
<tr>
<td>EQ-i® Debrief</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>34.4</td>
</tr>
<tr>
<td>No</td>
<td>164</td>
<td>65.6</td>
</tr>
<tr>
<td>Retention to Spring 2015 Semester</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>232</td>
<td>92.8</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
<td>7.2</td>
</tr>
</tbody>
</table>
### Table 6

**Measures of Central Tendency for Continuous, Descriptive Variables of Study**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Sample Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Total Score</td>
<td>250</td>
<td>22.99</td>
<td>4.03</td>
<td>14 - 32</td>
</tr>
<tr>
<td>High School GPA</td>
<td>250</td>
<td>3.25</td>
<td>0.74</td>
<td>0.00 - 4.00*</td>
</tr>
<tr>
<td>Age</td>
<td>250</td>
<td>18.21</td>
<td>0.66</td>
<td>18 - 24</td>
</tr>
</tbody>
</table>

*Note.* Institution’s Institutional Research office indicated that there were 7 cases without reported high school GPA.

### Reliability

The instrument used in this study was the Emotional Quotient Inventory (EQ-i®) for Higher Education. EQ-i® contains 133 self-report items. The items were split into 15 subscales, which were used to compute five domain scales and a total score. The five specified EI domains and corresponding subscales are: Intrapersonal (Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, Self-Actualization), Interpersonal (Empathy, Social Responsibility, Interpersonal Relationships), Stress Management (Stress Tolerance, Impulse Control), Adaptability (Reality Testing, Flexibility, Problem Solving), and General Mood (Optimism, Happiness). According to the Bar-On Emotional Quotient Inventory (EQ-i®) for Higher Education, students’ overall EQ-i® scale score between 60 and 89 is considered low and requires enrichment; the range of 90-119 notes effective functioning; and scale scores between 120 and 150 indicate enhanced functioning (Bar-On, 1997a; Bar-On, 1997b; Bar-On, 2006).

Table 7 presents the measures of central tendency and the Cronbach’s alpha coefficients for the five domain scales derived from the EQ-i® assessment along with the
total EQ-i® score. Cronbach’s coefficient alpha is a measure of internal consistency/reliability. A Cronbach’s coefficient alpha value of .70 or greater indicates good reliability of an instrument with the data collected (Tabachnick & Fidell, 2007). Two domains from the EQ-i® had a Cronbach’s alpha value lower than .70, Stress Management (α = .450) and Adaptability (α = .686). According to Kline (2000), cognitive tests, such as intelligence tests, indicate good reliability with a Cronbach alpha cutoff point of .70, however, when dealing with psychological constructs, values below .70 are reasonably expected because of the diversity inherent in a psychological assessments or self-report measures. Additionally, the instrument used in this study has been used and reported on often in the literature. Therefore, the instrument was considered reliable and useful for inferential analysis.
Table 7

*Measures of Central Tendency and Cronbach’s Alpha Coefficients for the Emotional Quotient Inventory (EQ-i®) (N = 250)*

<table>
<thead>
<tr>
<th>Composite Scale/Subscale</th>
<th>M</th>
<th>SD</th>
<th>Sample Range</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total EQ-i® Score</td>
<td>93.05</td>
<td>14.16</td>
<td>52-130</td>
<td>.857</td>
</tr>
<tr>
<td>Intrapersonal Domain Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Regard</td>
<td>93.78</td>
<td>15.40</td>
<td>45-125</td>
<td>.824</td>
</tr>
<tr>
<td>Emotional Self-Awareness</td>
<td>95.62</td>
<td>15.38</td>
<td>47-130</td>
<td>---</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>97.48</td>
<td>15.37</td>
<td>55-130</td>
<td>---</td>
</tr>
<tr>
<td>Independence</td>
<td>88.82</td>
<td>15.02</td>
<td>42-126</td>
<td>---</td>
</tr>
<tr>
<td>Self-Actualization</td>
<td>99.18</td>
<td>14.96</td>
<td>47-126</td>
<td>---</td>
</tr>
<tr>
<td>Interpersonal Domain Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empathy</td>
<td>99.22</td>
<td>14.16</td>
<td>51-133</td>
<td>.837</td>
</tr>
<tr>
<td>Social Responsibility</td>
<td>99.26</td>
<td>14.78</td>
<td>52-123</td>
<td>---</td>
</tr>
<tr>
<td>Interpersonal Relationships</td>
<td>99.68</td>
<td>13.64</td>
<td>56-129</td>
<td>---</td>
</tr>
<tr>
<td>Stress Management Domain Score</td>
<td>99.56</td>
<td>14.60</td>
<td>58-133</td>
<td>---</td>
</tr>
<tr>
<td>Stress Tolerance</td>
<td>96.00</td>
<td>13.67</td>
<td>59-127</td>
<td>.450</td>
</tr>
<tr>
<td>Impulse Control</td>
<td>92.97</td>
<td>15.54</td>
<td>55-127</td>
<td>---</td>
</tr>
<tr>
<td>Adaptability Domain Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reality Testing</td>
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<td>Flexibility</td>
<td>90.50</td>
<td>14.01</td>
<td>54-135</td>
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<td>Problem Solving</td>
<td>88.70</td>
<td>14.87</td>
<td>45-128</td>
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<tr>
<td>General Mood Domain Score</td>
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<td>Optimism</td>
<td>95.17</td>
<td>15.27</td>
<td>48-134</td>
<td>---</td>
</tr>
<tr>
<td>Happiness</td>
<td>93.16</td>
<td>14.19</td>
<td>56-129</td>
<td>---</td>
</tr>
</tbody>
</table>

*Note. M = Mean; SD = Standard Deviation*

Assumptions

The dataset was investigated to ensure that it satisfied the assumptions of the regression analyses, namely: absence of missing data, absence of outliers, normality, linearity and homoscedasticity, and absence of multicollinearity between the independent
variables. None of the records were missing data on the dependent variable of the study. Therefore, the assumption of absence of missing data was met.

Outliers in a dataset have the potential to distort results of an inferential analysis. Logistic regression is sensitive to outliers and multicollinearity (Pallant, 2013). A check of residuals on the casewise listing returned by SPSS for the dependent variable of Retention to 2015 Spring Semester was performed to inspect for outliers. A case with a residual value greater than 3 or less than -3 indicates that the model did not fit well for that particular record (Field, 2005). In the first model there were eight outliers (3% of the data), in the second model there were nine outliers (<4% of the data), and in the third model there were six outliers (<3% of the data). In order to justify removing outliers found in a logistic regression model, the cases should be inspected for abnormalities (Field, 2005). All outlying cases were closely examined and it was determined that these cases were not unusual. Therefore, all cases were retained for analysis with the logistic regression and the outlier assumption was met.

Assumptions of linearity between study variables and homoscedasticity were checked with scatterplots of the data. The assumptions of linearity and homoscedasticity were met. Multicollinearity occurs when independent variables of a study are highly correlated with each other. Highly correlated is defined as a correlation coefficient between two variables of .90 or greater, (Pallant, 2013). Multicollinearity between the variables used as independent predictor variables in both regression analyses were performed via Pearson’s product moment correlational analysis. Multicollinearity between the variables used as independent predictor variables in each of the three regression analyses was assessed. Multicollinearity was not detected for any of the
variables used as independent predictors for the regression analyses (see Table 8).

Therefore, the assumption of absence of multicollinearity was met.

Table 8

Correlation Coefficients of the Variables used in Regression Analyses (N = 250)

<table>
<thead>
<tr>
<th>EQ-I Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>11</th>
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<td>Emotional</td>
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<td>Self-Awareness</td>
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<td>.514**</td>
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<td>Assertiveness</td>
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<tr>
<td>Independence</td>
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<td>.329**</td>
<td>.600**</td>
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<td>Self-Actualization</td>
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<td>Empathy</td>
<td>.191**</td>
<td>.355**</td>
<td>.176**</td>
<td>.136*</td>
<td>.424**</td>
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<td>Social Responsibility</td>
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<td>.129**</td>
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<td>.027**</td>
<td>.263**</td>
<td>.580**</td>
<td>.606**</td>
<td>.490**</td>
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<tr>
<td>Stress</td>
<td>.488**</td>
<td>.282**</td>
<td>.456**</td>
<td>.486**</td>
<td>.343**</td>
<td>0.121</td>
<td>0.078</td>
<td>0.322**</td>
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<td>Impulse</td>
<td>0.124</td>
<td>0.04</td>
<td>0.035</td>
<td>0.202**</td>
<td>0.07</td>
<td>.159**</td>
<td>.233**</td>
<td>0.041</td>
<td>.291**</td>
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<td>Reality</td>
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<td>.519**</td>
<td>.452**</td>
<td>.521**</td>
<td>.476**</td>
<td>.241**</td>
<td>.216**</td>
<td>.403**</td>
<td>.429**</td>
<td>.403**</td>
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<tr>
<td>Flexibility</td>
<td>.392**</td>
<td>.269**</td>
<td>.410**</td>
<td>.508**</td>
<td>.382**</td>
<td>.204**</td>
<td>.206**</td>
<td>.354**</td>
<td>.608**</td>
<td>.326**</td>
<td>.491**</td>
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<tr>
<td>Problem Solving</td>
<td>.201**</td>
<td>.242**</td>
<td>.330**</td>
<td>.329**</td>
<td>.326**</td>
<td>.264**</td>
<td>.297**</td>
<td>.216**</td>
<td>.434**</td>
<td>.249**</td>
<td>.383**</td>
<td>.389**</td>
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<tr>
<td>Optimism</td>
<td>.642**</td>
<td>.438**</td>
<td>.590**</td>
<td>.476**</td>
<td>.609**</td>
<td>.410**</td>
<td>.372**</td>
<td>.566**</td>
<td>.713**</td>
<td>.163**</td>
<td>.438**</td>
<td>.552**</td>
<td>.474**</td>
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</tr>
<tr>
<td>Happiness</td>
<td>.709**</td>
<td>.543**</td>
<td>.429**</td>
<td>.328**</td>
<td>.627**</td>
<td>.341**</td>
<td>.268**</td>
<td>.678**</td>
<td>.442**</td>
<td>0.105</td>
<td>.486**</td>
<td>.362**</td>
<td>.187**</td>
<td>.634**</td>
</tr>
</tbody>
</table>

Note. * p < .05 (2-sided test); ** p < .01 (2-sided test).

Analysis

A total of 250 records were included for testing. The results of the analyses are presented according to each of the research questions.

Binary Logistic Regression Results

RQ1. Is a student’s overall EI score associated with student retention (retention to spring semester)? The dependent variable of retention to spring semester was coded as 0 = no and 1 = yes. Initially, state was included as an independent predictor variable in the model (coded as 0 = Colorado and 1 = out of state), but this variable returned high magnitude beta values and inflated standard errors, along with a very small
odds ratio. These extreme values are indicative of a phenomenon called quasi-complete separation. Quasi-complete separation is defined when nearly all of the observations of a predictor variable have a probability near 1 of being allocated to the response group in the outcome variable (retention to 2015 spring semester). In the case of quasi-complete separation, the maximum likelihood estimates may not exist and the odds ratio estimates will be very large (if the B coefficient is positive) or very small (if the B coefficient is negative), and the standard errors will be very large. In order to determine if complete or quasi-complete separation was the source of the extreme values for the state variable, the dataset was split based on state, and frequency of the dependent variable of retention was checked. It was discovered that all but one of the students who lived outside of the state of Colorado were enrolled in the 2015 spring semester (96.7%). Table 9 presents a cross-tabulation of the frequencies and percentages of the state variable. The state variable was thus removed from all of the logistic regression models.

Table 9

*Frequencies and Percentages of Participants who Enrolled in 2015 Spring Semester Split Across the Independent Variable of State*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Retention to 2015 Spring Semester</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Frequency</td>
<td>%</td>
<td>No</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>State</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorado</td>
<td></td>
<td>203</td>
<td>92.3</td>
<td>17</td>
<td>7.7</td>
<td></td>
</tr>
<tr>
<td>Out of state</td>
<td></td>
<td>29</td>
<td>96.7</td>
<td>1</td>
<td>3.3</td>
<td></td>
</tr>
</tbody>
</table>

After the independent variable of state was removed from the models, the independent variables in the first model included: Total EQ-i® Score (continuous),
gender (coded as 0 = female and 1 = male), ethnicity (coded as 0 = white and 1 = other),
ACT score (continuous), high school GPA (continuous), and age (continuous).

Variability of the model was assessed using two statistics, Cox and Snell R-
Square ($R^2 = .033$) and Nagelkerke R-Square ($R^2 = .080$). These two tests indicated that
between 3% and 8% of the variability in the dependent variable was explained by the
predictors of the model. Percentage accuracy in classification (PAC) of the correct
outcome category of retention to the spring 2015 semester for the six predictors in the
model was 92.8%, indicating no improvement over the base model constant only (no
predictors, all cases reported not enrolling in the 2015 spring semester) percentage
correct of 92.8%. Wald statistics indicated that none of the predictors contributed
significantly to the model. Table 10 presents results of the first logistic regression
performed to address Research Question 1.

Table 10

*Linear Regression Analysis of Retention to 2015 Spring Semester Regressed on the Total
EQ-i® Score and Descriptive Variables of Study (N = 250)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE$</th>
<th>Wald</th>
<th>$p$</th>
<th>Odds Ratio</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total EQ score</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.29</td>
<td>.591</td>
<td>0.99</td>
<td>0.95</td>
<td>1.03</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.46</td>
<td>0.62</td>
<td>0.54</td>
<td>.461</td>
<td>0.63</td>
<td>0.19</td>
<td>2.14</td>
</tr>
<tr>
<td>White</td>
<td>-0.74</td>
<td>0.68</td>
<td>1.19</td>
<td>.276</td>
<td>0.48</td>
<td>0.13</td>
<td>1.81</td>
</tr>
<tr>
<td>ACT Score</td>
<td>-0.12</td>
<td>0.07</td>
<td>2.68</td>
<td>.102</td>
<td>0.89</td>
<td>0.77</td>
<td>1.02</td>
</tr>
<tr>
<td>High school GPA</td>
<td>-0.38</td>
<td>0.33</td>
<td>1.33</td>
<td>.249</td>
<td>0.69</td>
<td>0.36</td>
<td>1.30</td>
</tr>
<tr>
<td>Age</td>
<td>0.28</td>
<td>0.27</td>
<td>1.11</td>
<td>.292</td>
<td>1.33</td>
<td>0.78</td>
<td>2.24</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.65</td>
<td>5.17</td>
<td>0.26</td>
<td>.608</td>
<td>0.07</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
Note. B = Intercept; SE = Standard Error of the Intercept; p = Level of Significance. Reference category for Gender = Female.

RQ2: Is a student's domain scores associated with student retention (retention to spring semester)? The independent variables in the second model included the 5 continuous EQ-i® Domain Scores (Interpersonal Score, Intrapersonal Score, Stress Management Score, Adaptability Score, and General Mood Score) along with the descriptive variables of: gender (coded as 0 = female and 1 = male), ethnicity (coded as 0 = white and 1 = other), ACT score (continuous), high school GPA (continuous), and age (continuous).

Variability of the model was assessed using two statistics, Cox and Snell R-Square ($R^2 = .040$) and Nagelkerke R-Square ($R^2 = .100$). These two tests indicated that between 4% and 10% of the variability in the dependent variable was explained by the predictors of the model. Percentage accuracy in classification (PAC) of the correct outcome category of retention to the spring 2015 semester for the 10 predictors in the model was 92.8%, indicating no improvement over the base model constant only (no predictors, all cases reported not enrolling in the 2015 spring semester) percentage correct of 92.8%.

Wald statistics indicated that none of the predictors contributed significantly to the model. Table 11 presents results of the second logistic regression performed to address Research Question 2.
Table 11

*Logistic Regression Analysis of Retention to 2015 Spring Semester Regressed on EQ-i® Domain Scores and Descriptive Variables of Study (N = 250)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>p</th>
<th>Odds Ratio</th>
<th>95% CI for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapersonal domain score</td>
<td>0.03</td>
<td>0.03</td>
<td>0.85</td>
<td>.357</td>
<td>1.03</td>
<td>0.97 - 1.09</td>
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<td>Interpersonal domain score</td>
<td>-0.01</td>
<td>0.03</td>
<td>0.18</td>
<td>.669</td>
<td>0.99</td>
<td>0.94 - 1.04</td>
</tr>
<tr>
<td>Stress management domain score</td>
<td>-0.02</td>
<td>0.03</td>
<td>0.50</td>
<td>.481</td>
<td>0.98</td>
<td>0.93 - 1.03</td>
</tr>
<tr>
<td>Adaptability domain score</td>
<td>&lt;0.005</td>
<td>0.03</td>
<td>0.02</td>
<td>.903</td>
<td>1.00</td>
<td>0.95 - 1.07</td>
</tr>
<tr>
<td>General mood domain score</td>
<td>-0.02</td>
<td>0.03</td>
<td>0.54</td>
<td>.463</td>
<td>0.98</td>
<td>0.92 - 1.04</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.41</td>
<td>0.68</td>
<td>0.37</td>
<td>.543</td>
<td>0.66</td>
<td>0.18 - 2.49</td>
</tr>
<tr>
<td>White</td>
<td>-0.72</td>
<td>0.68</td>
<td>1.11</td>
<td>.292</td>
<td>0.49</td>
<td>0.13 - 1.86</td>
</tr>
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<td>ACT Score</td>
<td>-0.11</td>
<td>0.07</td>
<td>2.36</td>
<td>.124</td>
<td>0.89</td>
<td>0.77 - 1.03</td>
</tr>
<tr>
<td>High school GPA</td>
<td>-0.38</td>
<td>0.33</td>
<td>1.33</td>
<td>.249</td>
<td>0.69</td>
<td>0.36 - 1.30</td>
</tr>
<tr>
<td>Age</td>
<td>0.30</td>
<td>0.28</td>
<td>1.09</td>
<td>.297</td>
<td>1.34</td>
<td>0.78 - 2.30</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.74</td>
<td>5.32</td>
<td>0.11</td>
<td>.744</td>
<td>0.18</td>
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</tr>
</tbody>
</table>

*Note. B = Intercept; SE = Standard Error of the Intercept; p = Level of Significance. Reference category for Gender = Female. Reference category for Ethnicity = White.*

**RQ3: Is a student’s subscale scores associated with student retention**

(retention to spring semester)? The independent variables in the third model included the 15 continuous EQ-i® Dimension Scores (Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, Self-Actualization, Empathy, Social Responsibility, Interpersonal Relationships, Stress Tolerance, Impulse Control, Reality Testing, Flexibility, Problem Solving, Optimism, and Happiness) along with the descriptive variables of: gender (coded as 0 = female and 1 = male), ethnicity (coded as 0 = white
and 1 = other), ACT score (continuous), high school GPA (continuous), and age (continuous).

Variability of the model was assessed using two statistics, Cox and Snell R-Square ($R^2 = .097$) and Nagelkerke R-Square ($R^2 = .240$). These two tests indicated that between 10% and 24% of the variability in the dependent variable was explained by the predictors of the model. Percentage accuracy in classification (PAC) of the correct outcome category of retention to the spring 2015 semester for the 20 predictors in the model was 93.2%, a slight improvement over the base model constant only (no predictors, all cases reported not enrolling in the 2015 spring semester) percentage correct of 92.8%.

Wald statistics indicated that two of the predictors contributed significantly to the model. Independence was significant, OR = 1.08, 95% CI for OR = (1.01, 1.15); $p = .021$. The odds ratio for the Independence variable indicated that the odds of a student enrolling in the 2015 spring semester are 1.08 times greater for each 1 unit increase in the Independence variable. Thus, students who are more self-reliant and free of emotional dependency on others were 7% more likely to enroll in the 2015 spring semester than students who were less independent. Additionally, Impulse Control was significant, OR = 0.95, 95% CI for OR = (0.91, 1.00); $p = .035$. The odds ratio for the Impulse Control variable indicated that the odds of a student enrolling in the 2015 spring semester are 0.95 times greater for each 1 unit increase in the Impulse Control variable. Thus, students with less control over their impulses were 5% less likely to enroll in the 2015 spring semester than students with more control over their impulses. No other predictors were
significant in this model. Table 12 presents results of the third logistic regression performed to address Research Question 3.

Table 12

*Logistic Regression Analysis of Retention to 2015 Spring Semester Regressed on EQ-i® Dimension Scores and Descriptive Variables of Study (N = 250)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>p</th>
<th>Odds Ratio</th>
<th>Lower</th>
<th>Upper</th>
<th>95% CI for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Regard</td>
<td>&lt;-0.005</td>
<td>0.03</td>
<td>0.01</td>
<td>.929</td>
<td>1.00</td>
<td>0.95</td>
<td>1.05</td>
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</tr>
<tr>
<td>Emotional Self-Awareness</td>
<td>-0.02</td>
<td>0.03</td>
<td>0.34</td>
<td>.561</td>
<td>0.98</td>
<td>0.93</td>
<td>1.04</td>
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</tr>
<tr>
<td>Assertiveness</td>
<td>-0.01</td>
<td>0.03</td>
<td>0.14</td>
<td>.713</td>
<td>0.99</td>
<td>0.93</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td>0.07</td>
<td>0.03</td>
<td>5.35</td>
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<td>1.00</td>
<td>0.95</td>
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<td>0.91</td>
<td>2.98</td>
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<td>Constant</td>
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<td>0.64</td>
<td>.424</td>
<td>0.01</td>
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</table>

Propensity Score Matching. Does meeting for the EQ-i® debrief influence student retention?

Propensity score matching via the psmatch2 function in Stata v.14 was used to match students who attended the EQ-i® debrief with students who did not attend the EQ-i® debrief, in order to determine the effect of the EQ-i® debrief. One propensity score matching model was computed for the outcome of student persistence. Bootstrapping with 500 replications was used to derive the effects and standard errors of the regression treatment effects, which are reported in the results below and in Table14. The results are presented according to each outcome.

Student retention. Student retention was defined by the variable of Retention to Spring Semester. The baseline characteristics used to derive the propensity scores of membership in the EQ-i® debrief treatment group included the 15 subscales of the EQ-i® (Self-Regard, Emotional Self-Awareness, Assertiveness, Independence, Self-Actualization, Empathy, Social Responsibility, Interpersonal Relationship, Stress Tolerance, Impulse Control, Reality Testing, Flexibility, Problem Solving, Optimism, and Happiness), gender, ethnicity (coded as 1 = white, 0 = non-white), high school GPA, ACT score, state, and the students’ ages in years. Although the state variable was not included in the logistic regression model due to quasi-complete separation, it was included in the propensity score model. The propensity scores were computed using a logit model and simple nearest-neighbor matching to match scores of students who were debriefed with student who were not debriefed. The default option of matching all tied observations was used.
Results indicated attending the EQ-i® debrief had a statistically significant effect on the outcome of student retention \((B = -0.07, SE B = 0.08, z = -0.95, p = .342; 95\% \text{ CI (-0.23, 0.082)})\). The value of the coefficient suggests that a student who received the EQ-i® debrief had a 7\% decrease in enrolling in the Spring 2015 semester. The results of the propensity score matching as it relates to the effect of the EQ-i® debrief indicated a negative treatment effect. Table 13 presents the sample characteristics and estimated effects of the EQ-i® debrief for regression models using the matched data.

Table 13

*Propensity Score Matching - Findings of Regression Models Using Matched Sample (N = 236)*

<table>
<thead>
<tr>
<th>Variable/Measure</th>
<th>(B)</th>
<th>(SE)</th>
<th>(p)</th>
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<tbody>
<tr>
<td>Treatment Effect (Treatment - Control)</td>
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<td>0.06</td>
<td></td>
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<tr>
<td>Regression Treatment Effect</td>
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<td>0.08</td>
<td>0.342</td>
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*Note. Mean propensity score = .345; \(B = \) Intercept; \(SE = \) Standard Error of the Intercept; \(p = \) Level of Significance.*
CHAPTER 5

DISCUSSION

Although there are both empirical and theoretical data focusing on EI as it relates to education, additional studies need to be performed in order to confirm a causal relationship between EI and student retention and success. This quasi-experimental, quantitative study was designed to determine whether EI influences student retention.

RQ1: Is a student’s overall EI score associated with student retention?

RQ2: Is a student’s domain scores associated with student retention?

Research questions 1 and 2 indicated no predictors contributed significantly to the models. The overall EI score and domain scores were not found to be statistically significant. The models for Research Questions 1 and 2 explained little variance in retention.

RQ3: Is a student’s subscale scores associated with student retention?

Research Question 3 Wald statistics indicated that only two of the predictors contributed significantly to the model. Independence was significant, OR = 1.07, 95% CI for OR = (1.00, 1.12); p = .021. The odds ratio for the Independence variable indicated that the odds of a student enrolling in the 2015 spring semester are 1.07 times greater for each 1 unit increase in the Independence variable. Thus, students who are more self-reliant and free of emotional dependency on others were 7% more likely to enroll in the 2015 spring semester than students who were less emotionally independent. Impulse Control was also significant, OR = 0.95, 95% CI for OR = (0.91, 1.00); p = .035. The odds ratio for the Impulse Control variable indicated that the odds of a student enrolling in the 2015 spring semester are 0.95 times greater for each 1 unit increase in the Impulse...
Control variable. Thus, students with more control over their impulses were 5% more likely to enroll in the 2015 spring semester than students with less control over their impulses. Statistical significance was not found for any of the other EQ-i® subscale predictors.

**RQ4: Does meeting for the EQ-i® debrief influence student retention?**

Propensity score matching on the dependent variable was analysed. All four matching techniques were used, the balance test was met, and all four yielded a similar number of matches. Results indicated a negative treatment effect for students attending the EQ-i® debrief \( (B = -0.07, SE = 0.05, z = -0.52, p = .606; 95\% CI (-0.11, 0.06). \) The value of the coefficient suggests that a student who received the EQ-i® debrief had a 7% decrease in enrolling in the spring 2015 semester. Based on the propensity score analysis, there is not sufficient evidence to indicate that meeting for the EQ-i® debrief positively influences student retention.

**Discussion**

Institutions of higher education are under pressure to increase student retention rates and as such, are concentrating on first-year students and their transition into higher education. As discussed, first-year students are likely to leave their institutions of higher education without completing their college degree (Habley, Bloom, Robbins, & Robbins, 2012; Nordstrom, Swenson, Goguen, & Hiester, 2014; Selingo, 2013; Tinto, 1993). According to Tinto (1993), most students leave their institution after their first semester. In an effort to improve student retention, assessing EI was used as the basis of the intersection of multiple student theories, including self-efficacy, student involvement, and student development. If students are able to understand and effectively manage their
emotions, thus increasing intrapersonal, interpersonal, adaptability, and stress management skills, students may be more apt to participate in more campus activities, reach out for academic help, and establish better and more satisfying peer relationships.

The transitional process from high school to college is fundamental for the individual maturation process. Traditional student development theories like Tinto’s (1993), Astin’s (1975), and Pascarella’s and Terenzini’s (2005) link student development to student involvement, sense of belonging, engagement, and individual effort towards learning at their institutions of higher education. In essence, first-year experience programs, counseling programs, residence life programs, tutoring centers, academic coaches, academic advising, and other campus activities are designed to aid student development, but also student retention. Institutions of higher education are not focusing solely on academics in an effort to increase retention and academic success. Institutions are becoming more aware of the non-cognitive variables that impact student development. Chickering and Reisser (1993) viewed student development as a process by which students develop and master specific skills in order to progress in the adult maturation process, including EI. Skill development, as well as knowledge acquisition, are significant factors in the process of student development. In this study, it was conceived that students who participated in taking the EQ-i® assessment and meeting for a debrief would benefit from learning about their EI skills. While they probably benefited from this learning, it did not make an appreciable difference to retention.

The learning environment is also an important aspect of student development and thus leads to self-constructivist and self-efficacy theoretical frameworks. Self-efficacy theories need to be considered when attempting to increase student retention and student
academic success. Although student development theories like that of Tinto, Astin, and others seek to attribute retention and academic success to student involvement in campus activities, Bandura’s (1971) self-efficacy theory seeks to build student development through student learning. Self-efficacy is the effort one expends on a task and how well one copes with his or her chosen course of action. If student development researchers believe student academic persistence and success can be predicted based on students’ and institutions’ environmental characteristics, then EI as a skill is important in the student maturation process.

Assessing EI is a method in which higher education institutions can engage students and potentially motivate students academically in an effort to increase student retention. Of the four research questions posed in this study, one of the questions was satisfied. In research question 3, Independence and Impulse Control were found to be predictors of student retention. The results of this study do not indicate that higher levels of EI, including total EQ-i®, EQ-i® domains, and other EQ-i® subscales, are associated with student retention. A relationship between EI and two subscales was found, but was very small. These results add to, but do not necessarily correlate to the multiple studies related to EI and student success (Durek et. al, 2006; Chemers, Hu, & Garcia, 2001; DiFabio & Palazzeschi, 2009; Emmerling & Goleman, 2003; Parker, Creque Sr., Barnhart, Harris, Majeski, Wood, 2004; Parker, Hogan, Eastabrook, Oke & Wood, 2006).

Many of the aforementioned studies look at the correlation between total EI score, retention, and academic achievement. Some of the studies look at the individual subscales as they relate to retention and achievement, but the subscales of Independence and Impulse Control do not appear to be discussed individually as they relate to student
retention. This is important to note as both domains and subscales are important in the
development of the whole student (Stein et al., 2013). Students lower in Independence are
typically emotionally dependent on others to help them make decisions. Lower
Independence scores also tend to attribute to lower problem solving skills, which impacts
Impulse Control and vice versa (Stein et al., 2013). Problem Solving as a subscale was
not found to be statistically significant in any of the analyses, but is impacted by lower
Independence and Impulse Control scores. Lower Impulse Control scores indicate a
lower resistance to the impulse to act. Put simply, the student reacts to the emotion rather
than the situation and this can result in many different outcomes, albeit, some negative.
Dependent, impulsive students would find it difficult to make decisions, cope with
challenges, and this could ultimately erode their interpersonal skills (Stein et al., 2013).
Without an understanding of EI skills and how they relate to student development, lower
EI scores can proceed on a continuum that feels like a roller coaster that never ends.
More research and discussion is needed on the EI subscales as they relate to retention.

In research question 4, propensity score matching was used to determine whether
meeting for a debrief had an impact on persistence. Results indicated attending the EQ-i®
debrief had a negative treatment effect on student retention. The value of the coefficient
suggests that a student who received the EQ-i® debrief had a 7% decrease in enrolling in
the Spring 2015 semester, a very small difference, but nevertheless important because the
difference was negative. Despite the negative treatment effect, researching the debrief
itself is uncommon in the literature. It is difficult to require students to meet for a
debrief. However, meeting for an EI debrief would align with Astin’s (1984) theory of
student development as the EQ-i® debrief provides students an active role in the learning
process. When students meet for a debrief, each score is explained and reviewed and students are asked about specific results they wish to develop. Debriefing sessions also help students work on an EI development plan, which is part of the comprehensive EI report. Martinez et al. (2013) found that of the students who completed the assessment and met with an EQ-i® coach for a debrief, 87% persisted to the following semester versus the 60% who did not meet with a coach. Coaching is said to positively contribute to a student's improvement of similar EI factors like self-awareness, self-regulation, and overall welfare (Mega, Ronconi & De Beni, 2014; Richman, Rademacher, & Maitland, 2014). In another study, Willis (2014), too, debriefed all participating study respondents and found that GPA, ACT composite score, and the EI subscale of Social Responsibility were all positive and statistically significant predictors of student retention and success. Carthy et al. (2013), Martinez et al. (2013), and Willis (2014) are three studies in the literature that expressly mention using the debrief in their studies.

Limitations

The greatest limitation of this study was the design. With more planning, the design of the study could have been experimental. Treatment and control groups could have been created based on the population of students who participated. Additionally, retention needs to be measured from fall to fall, not fall to spring. Although I did not have consent from students to pull their retention data from fall 2015, I was able to gauge a students' presence on campus via their e-mail, which is considered directory (open access) data. From the number of invalid e-mail accounts, I discovered 71 students of the 250 students in the study were no longer on campus, a 28% difference. Part of the issue with the fall to spring data indicated 93% of the 250 students enrolled in the spring 2015
semester, which may have created a ceiling effect in the data making it difficult to see any quantifiable differences by measuring retention at one level. The homogeneity of the sample was also an issue that could explain the issues with variance and no significant association between the dependent variable and independent variables. Most of the sample was white, female, and from Colorado. The lack of diversity in the sample could have impacted the analyses, causing non-significant results and the estimates from the regression models to be so imprecise.

The propensity score matching analysis resulted in a negative treatment effect. The working hypothesis is the students who sit for the debrief would be more likely to persist to the next semester, but the results indicated that students who sit for a debrief are 7% less likely to enroll. These results could indicate that the debrief helps students understand their EI skills better, which may necessitate them leaving the university. One can speculate that it is also possible that the students who did not enroll and met for a debrief received good information/advice about themselves and decided that college was not for them. The overall EI scores for the data set were 93, which is considered on the lower end of effective functioning. It is plausible that the students who attended a debrief were already anticipating leaving the institution for various reasons. This necessitates further research on the students who opt to sit for the debrief.

Recommendations

The results of this quasi-experimental, quantitative study yielded information that supports the need for further study. As indicated in chapter 2, much of the EI research consists of data supporting the association, not causality, of EI scores and their related impact on retention and academic success. Although this study yielded a negative
treatment effect of the debrief on retention, there needs to be additional research with the debrief itself. More attention needs to be paid to the students who elect to sit for the debrief. Are these students on academic probation? Do they have lower GPAs? Are they from any particular major? What is their demographic makeup? There is also an opportunity to design a mixed-methods study using quantitative data from the EI scores and qualitative data from the debriefs. Additionally, there is also opportunity for an ex-post-facto study for the students who did not re-enroll. Important information to look for would be college GPA and number of college credits taken to determine if there is a relationship between academics and EI. There was a significant number of students in the study who re-enrolled, but there was limited data on those that did not. This would offer more depth to future studies and would also add to the current body of literature regarding EI, student academic success, and student persistence.

**Conclusions**

In summary, there is a small association between EI and student retention. However, there is great variation between sample sizes, types of higher education institutions, instruments used, recruitment methods, etc. that makes it extremely difficult to make any causal connection. The EQ-i® assessment for higher education and its subscales influence students’ development and self-efficacy. Despite the results of the propensity score matching, the debriefs, as an intervention may have the potential to help students learn more about themselves by engaging in the debrief. When students’ results are reviewed and discussed in terms of how emotions influence students’ academic achievement, they are engaged in the learning process and may feel more connected as they learn about additional campus resources. Although the debriefs were not part of the
study, some of the students who did meet for a debrief were struggling in some manner, whether academic or personal. The statistical significance of the subscales of Independence and Impulse Control are important to note again here because these subscales could contribute to students’ decisions to depart the institution. Many students admit to struggling with mental health issues, family and financial issues, and a host of other problems that interfere with their development, both academically and personally. Some of the students who met for a debrief were referred to the counseling center for further help. One can only conjecture a link between meeting for a debrief and associated mental health and other issues. It may have been a wise choice for a student to depart if they have a mental health issue or if they are not ready to fully engage and invest in their education. More research needs to be completed on the group of students who meet for a debrief. Results could yield additional information on EI and its influence on student retention.
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Appendix A

Institutional Review Board Approval

University of Colorado
Colorado Springs

Institutional Review Board (IRB) for the Protection of Human Subjects

Date: 8/13/2014

IRB Review

<table>
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<th>IRB PROTOCOL NO.: 15-006</th>
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<tr>
<td>Protocol Title: Emotional Intelligence and the 21st Century College Student: Using Emotional Intelligence as a Stimulus for First-Year Student Persistence and Academic Achievement</td>
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<tr>
<td>Principal Investigator: Carrie Arnold</td>
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<tr>
<td>Faculty Advisor if Applicable: Sylvia Martinez</td>
</tr>
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<td>Application: New Application</td>
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<td>Type of Review: Exempt Category 2</td>
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<td>Risk Level: No more than Minimal Risk</td>
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This Protocol involves a Vulnerable Population: N/A (No Vulnerable Population)

Expires: *

*Note, if exempt: If there are no major changes in the research, protocol does not require review on a continuing basis by the IRB. In addition, the protocol may match more than one review category not listed.

Externally funded: ☐ No ☑ Yes

OSP #: Sponsor:

Thank you for submitting your Request for IRB Review. The protocol identified above has been reviewed according to the policies of this institution and the provisions of applicable federal regulations. The review category is noted above, along with the expiration date, if applicable.

Once human participant research has been approved, it is the Principal Investigator’s (PI) responsibility to report any changes in research activity related to the project:

• The PI must provide the IRB with all protocol and consent form amendments and revisions.
• The IRB must approve these changes prior to implementation.
• All advertisements recruiting study subjects must also receive prior approval by the IRB.
• The PI must promptly inform the IRB of all unanticipated serious adverse (within 24 hours). All unanticipated adverse events must be reported to the IRB within 1 week (see 45CFR46.104b). Failure to comply with these federally mandated responsibilities may result in suspension or termination of the project.
• Renew study with the IRB prior to expiration.
• Notify the IRB when the study is complete.

If you have any questions, please contact Michael Sanderson in the Office of Sponsored Programs at 719-255-3903 or irb@uccs.edu

Thank you for your concern about human subject protection issues, and good luck with your research.

Sincerely yours,

Deborah J. Keesey
UCCS IRB Chair

www.ucce.edu/cas/compliance/ 142C Austin Bldg Parkway Colorado Springs, CO 80918 719-255-3321 phone 719-255-3706 fax
Appendix B

Recruitment E-mail

Hello Freshmen Students and Welcome to <<X>>!

I would like to ask for your participation in an EI assessment (EQ-i®). The EQ-i® assessment is a tool used to measure EI (independence, interpersonal skills, empathy, etc.). I would like to offer you the opportunity to take the assessment for free.

In the next week, you will receive an e-mail from MHS, Inc. with the link to the assessment and you will each receive an individual login and personal password to access the assessment. You must be at least 18 years of age to complete the assessment. If you are under the age of 18, you will not be able to participate in the study. Prior to beginning the study, your faculty member will give you a consent form that needs to be completed PRIOR to you accessing the assessment link.

The assessment will ask you 133 questions regarding your EI. Be sure to type your name, gender, and age and answer each question honestly. There are no right or wrong answers. Do not think about the questions too long. The assessment should not take longer than 20-25 minutes. Please be sure to check your e-mail for your report and a follow up e-mail about scheduling your EQ-i® debrief.

You will meet with a member of campus that is EQ-i® certified and they will debrief you on your results. It is an integral part of the process. The debrief will last about 30 minutes. Once you complete the assessment, I will contact you about setting up your debrief time.

Students who participate in the study will be offered 50 extra credit points; 25 points for taking the assessment and 25 additional points for following up with the debrief.

If you have any questions, please contact me.

Sincerely,

Principal Investigator

IRB Approval # 15-008

Principal Investigator's Contact Information