### AN ABSTRACT OF THE DISSERTATION OF

<u>MaryJean Harris Williams</u> for the degree of <u>Doctor of Philosophy</u> in <u>Education</u> presented on <u>September 22, 2017.</u>

Title: Mentorship and Student Self-efficacy

Abstract approved: \_\_\_\_\_

Darlene F. Russ-Eft

Background: The United States has been under-producing college graduates since at least 1980, with many challenges suppressing students' self-efficacy. One approach to improving student outcomes is through mentorship. This dissertation applied Bandura's Social Cognitive Theory (SCT) and Kram's Mentor Relationship Development Theory (MRD) to discover whether students' campus mentorship experiences were related to changes in student self-efficacy. The literature was reviewed indicating a dearth of studies applying Kram's MRD to the college experience. Of particular interest was the need of college freshmen to make an immediate personal connection with someone who would build their confidence the way a mentor would. Purpose: The research hypotheses sought to discover whether more frequent and satisfying experiences with potential mentors on campus were associated with changes in freshmen self-efficacy.

Subjects: College freshmen surveys from two and four year colleges nationwide totaling 15,855 subjects were studied regarding their mentorship interactions and their self-efficacy beliefs. Research design: Using existing data, over 15,000 students nationwide had been surveyed before and after the freshman year. Six kinds of student self-efficacy were identified in the data: Academic self-confidence, Intellectual self-confidence, Social self-confidence, Emotional health, Drive to achieve, and Cooperativeness. A variety of mentorship experiences included interactions with faculty, advisors, counselors, and staff. Statistical analysis was conducted to explore these variables and identify relationships between mentorship experiences and student self-efficacy.

Findings: Factor analysis indicated that student self-efficacy is multi-faceted. Regression analysis indicated that the strongest positive influence on students' academic self-efficacy at the end of the freshman year was their academic self-efficacy at the beginning of the freshman year. The second strongest positive influence was incoming student grades, equal in impact to faculty believing in students' ability to succeed. Other positive influences included communicating regularly with professors, asking their advice after class, and interacting with them outside of formal class or office hours. Faculty interactions that predicted decreases in self-confidence included showing concern about students' progress and students' attending office hours. Career counseling had small positive influences. The strongest negative influence was gender. Being female was associated with lower academic self-confidence, made worse after mentorship experiences on campus. Being Asian and being Hispanic were associated with slight decreases in academic self-confidence, but improved after campus mentorship experiences. Conclusions: Student self-efficacy was influenced by potential mentors on campus. Consistent with literature (Sax et al., 2005), some contacts with faculty were associated with small positive changes, and some were associated with small negative changes. The most valuable mentorship experience was faculty believing in students' potential to succeed, consistent with Dweck (2007), Seligman (1998) and Steele (1997). This study reinforced that faculty need to continue to develop methods to support freshmen, particularly women. Mentorship on campus continues to be a powerful influence on student success, and is an area worthy of future research.

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by

MaryJean Harris Williams

### A DISSERTATION

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APPROVED:

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Dean of the College of Education

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

MaryJean Harris Williams, Author

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## CONTRIBUTION OF AUTHORS

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#### Chapter 1 Focus and Significance

#### Mentorship and Student Self-Efficacy

Education has never been more important, yet the United States has been underproducing graduates since at least 1980, contributing to income inequality and a decline of the middle class (American Association of Community Colleges, 2012). Nationwide, initiatives such as Oregon's 40-40-20 goal to educate its entire adult population by 2025 reflect policies designed to reverse the trend (Oregon State Senate, 2011; Oregon University System, 2012). In 2011, an initiative was launched to educate 5 million more students by 2020 (American Association of Community Colleges, 2012). Yet institutions of higher education continue to be criticized for low student success rates, low completion rates, poor preparation for employment, and poor transitions between schools and work (Bailey, Jaggars, & Jenkins, 2015). One way to bridge these disconnects and empower students to engage and complete degree programs is through mentorship (Truesdell, 1996; Zelek, Salaman, Qing, & Keller, 2013). Mentoring is defined as the "interactions between more-experienced mentors and less-experienced protégés, where mentors provide career (instrumental) and psychosocial (relational) knowledge, advice, and support" (Schunk & Mullen, 2013, p. 362). Mentoring is a process that is intentional, nurturing, insightful, supportive, and protective (Anderson & Shannon, 1988).

Particularly for first-generation students, success requires more than academic support. Many first generation students have overcome significant obstacles to apply and begin college (Rivera, 2014). Their success requires wrap-around support services and "connections with mentors and the cultivation of a college-going culture" (Oregon University System, 2012, p. 12). Furthermore, students are asking for face-to-face support in order to solve problems, set goals, and overcome obstacles to completing college (Bailey, Jaggers, & Jenkins, 2015). Mentorship is an area of student success with underdeveloped research (Crisp & Cruz, 2009). More needs to be discovered about the connections researchers have found linking mentoring with positive outcomes for both protégés and their mentors (Schunk & Mullen, 2013, p. ). While mentoring literature and programs have grown steadily, they have yet to resolve issues of definition, conceptualization, and theory development (Crisp & Cruz, 2009). This study concentrates on students' opportunities for developing on-campus mentoring relationships with academic professionals, and their connection to cultivating the self-efficacy students need to complete a college program.

Self-efficacy is defined as "belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1977a, p. 3). This self-confidence is considered especially central to the exercise of human agency. Human agency is defined as behavior that is proactive toward a goal (Rivera, 2014). Agency manifests in many ways, such as the ability to select and prioritize rules (West, 2004), and taking the initiative to learn about the college application process (Rivera, 2014). Unless people believe they can accomplish desired tasks, they have little incentive to act. Such beliefs have been found to affect the effort people put forth, how well they persevere when faced with obstacles, how effectively they monitor and motivate themselves, what they achieve, and what choices they make in life (Bandura, 1977b, 1997).

Mentoring opportunities for students are varied. Any contact with faculty, academic advisors, counselors, and staff could develop into a mentoring relationship with students. Contact with these academic professionals is individual in nature, and whether it develops into mentorship is unique to that dyad. For basic interactions to develop into effective mentor relationships, parties must choose it (Allen, Eby, & Lentz, 2006); they must invest some time in the relationship (Kram, 1983); and they must both gain some growth and satisfaction from the relationship (Findley, 2011; Fletcher & Mullen, 2012).

The urgency for students to complete college has never been greater. By empowering students to complete their programs, graduates have a better economic outlook, employers have a more capable workforce, and societies enjoy a more robust quality of life.

#### **Purpose of the Study**

While findings on mentorship have been positive (Crisp & Cruz, 2009) and indicate a positive impact on student persistence and grades, there is inconsistency and a lack of guiding theory in mentoring research. This research helps develop the body of knowledge by applying mentor relational development theory to a large sample of students to determine whether mentorship opportunities in the first year of college affect students' sense of self-efficacy. This study proposes a model for studying mentorship around three of its aspects: (a) roles, (b) time, and (c) benefits. Specifically, the purpose of this study is to look for correlations between students' opportunities for mentorship with academic professionals and changes in self-efficacy as reported by students in their first year of college via pre- and post- surveys administered annually by the UCLA Higher Education Research Institute (HERI) (Higher Education Research Institute, 2014b). Further, this study expands the body of knowledge about mentorship and student success, building upon much work, including that of Bandura, Crisp and Cruz, Erlich, Kram, Sax, Bryant and Harper, and others (Bandura, 1977a, 1997; Crisp & Cruz, 2009; Erlich & Russ-Eft, 2013; Kram, 1983; Sax, Bryant, & Harper, 2005). The research hypotheses are:

• Null hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is not related to student self-efficacy.

- Alternative hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is related to student self-efficacy.
- Null hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is not related to self-efficacy.
- Alternative hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is related to self-efficacy.

#### **Practical Significance**

Face-to-face mentoring and advising activities are on the front lines of student planning, and warrant the advantages of the growing culture of assessment (Love & Estanek, 2004; Suskie, 2004). It is important for faculty, advisors, and staff to be able to link student services to quantifiable student outcomes, such as greater self-efficacy. Faculty need to know whether the face-to-face activities they invest in students actually cultivate students' ability to succeed. Advisors need the opportunity to hone their advising protocols for maximum effectiveness. Administrators and policymakers need to know the outcomes of such activities in order to make good decisions about the use of time and resources. For all these reasons, it is important that lessons learned about what helps students succeed be tested, proven, and applied to student services practices to optimize benefits (Suskie, 2010).

Historically, student services have focused on the developmental model, acknowledging that education is a complex, personal growth process (Cohen & Kisker, 2010; Hemwall & Trachte, 1999). Literature also reflects experimentation with advising strategies to optimize student success (Calhoun, 1996; Love & Estanek, 2004). While advisors and mentors have teaching roles, there is little work examining the development of self-efficacy from the perspective of it being an act of learning. To apply the wisdom of adult learning theory to the work of advising and mentoring could be a powerful tool to improve outcomes for students' benefit (Erlich, 2011).

#### **Theoretical Frameworks**

Three theories guide this research: (a) mentor relationship development theory, (b) the cultivation of self-efficacy through social cognitive theory (SCT), and (c) the Input-Environment-Output (I-E-O) model. This literature review will explore two of the guiding theories, SCT, and mentor relationship development theory. The third guiding theory, the I-E-O model will be covered in more detail in the methods section.

Mentor relationships develop in four stages: initiation, cultivation, separation and redefinition (Kram, 1983).

- 1. The initiation stage takes between six and 12 months during which mentors identify protégé potential and gain their respect.
- 2. The cultivation stage follows, which includes the maximum range of benefits such as sponsorship, exposure, coaching, protection and psychosocial support.
- 3. The separation stage represents structural changes in organizational context, or psychological changes within one or both individuals.
- 4. Redefinition occurs when the relationship evolves to a new form such as friendship or peer-colleague, or the relationship may come to an end.

This study focuses on the first year of college in order to discover whether the benefits of the cultivation stage begin to accrue in the first year.

Bandura's social learning theory (SLT) identified four learning sources that build selfefficacy: (a) doing, (b) observing, (c) being persuaded, and (d) being encouraged in a way that reduces avoidance anxiety (Bandura, 1977a; Zimmerman & Kitsantas, 2014). In 1986, Bandura updated and expanded SLT calling it social cognitive theory (SCT) (Bandura, 1986). SCT recognized in addition to these personal factors that behavioral outcomes and the environment also influenced self-efficacy. Bandura discussed mastery modeling, which is another term for mentoring. SCT is a particularly fitting theory for mentoring relationships where empowerment is a primary goal. Because these four learning sources describe many kinds of student experiences, analyzing a variety of potential sources of mentoring relationships in terms of their effect on student self-efficacy will be enlightening and valuable for college leaders and educators, as well as build on what is known about SCT.

The I-E-O model guides this study's research methodology. By controlling for the attributes of incoming students, the influence of college environmental factors on students can be measured using quantitative methods (Astin & Antonio, 2012). This study will use measures of self-efficacy given by incoming students and compare them to measures given at the end of their freshman year. These measurements will be studied relative to students' reported interactions with academic professionals who are potential mentors, including faculty, advisors and counselors, and staff.

#### **Scholarly Significance**

While mentorship may refer to a variety of interactions, such as contact with faculty outside of class, academic advising, club membership, and other peer mentoring activities, rarely does the literature focus on the intersection between student mentorship and selfefficacy. The literature review that follows explores the use and application of these terms and lays the theoretical groundwork needed to study how mentorship affects student self-efficacy. SCT is well established as describing a set of sources of information that people use to develop self-efficacy. At the same time, the concept of self-efficacy is described in the literature using many different terms, such as self-regulation, resilience, buoyancy, grit, and self-confidence. Further, there are many different manifestations of it, including intellectual, social, and academic self-confidence, drive to achieve, cooperativeness, persistence and emotional health. This means that the literature is fractured and indistinct in defining the scope and meaning of this essential attribute. This study will develop this concept through the use of factor analysis on these seven different measures of student self-efficacy.

SCT has been applied to career planning in a measurable assessment (Erlich, 2011; Erlich & Russ-Eft, 2011, 2012, 2013). Erlich created a series of advising protocols that applied Bandura's three steps to the career advising setting. He found in a sample of 120 students a pattern of improved self-efficacy and self-directed learning with regard to career planning and exploration. This growth in self-efficacy took place in single advising sessions.

Kram's (1983) mentor relationship theory posits that most of the benefits of mentorship accrue during the cultivation stage, which begins from six to 12 months into the relationship. Yet Erlich's study (Erlich, 2011; Erlich & Russ-Eft, 2013) showed that growth in self-efficacy took place in a single advising session. This calls into question when the benefits of mentorship actually begin, perhaps even earlier, during the initiation stage. For this reason, it will be worthwhile to study the first year of college to see if more frequent mentorship interactions are associated with increases in self-efficacy.

Students also experience mentoring from faculty (Eagan, Herrera, Garibay, Hurtado, & Chang, 2011). The connection between student benefits and frequency of encounters with faculty is conflicted, with some authors claiming more engagement with faculty is better (Eagan et al.,

2011; Tinto, 2011) and others indicating the opposite (Sax et al., 2005). Students from underrepresented groups seem to respond to mentorship differently (Center for Community College Student Engagement, 2014b; Eagan et al., 2011; Martinez, 2014; Storlie, Moreno, & Portman, 2014), as do men and women (Rennick, 2005; Sax et al., 2005). More needs to be done to explore the complex mentoring experiences of students and the degree to which mentorship can be expected to cultivate self-efficacy.

Sax, et al. (2005) used the UCLA Higher Education Research Institute data (HERI) to examine different effects of student-faculty interaction on college outcomes for women and men, including many of the factors of self-efficacy planned for this study. However, this study is different in four important ways. First, their study compared outcomes over four years, while this study focuses on the freshman year. Second, their study was not structured to analyze the variables in terms of mentor relational development theory. Third, their study focused on faculty involvement only, rather than including advisors, counselors, and staff members as potential mentors. And finally, their data were from 1994 and 1998, so is worth updating. This study seeks to build on Sax, Bryant, and Harper and others, to focus on self-efficacy and mentorship over the first year of college.

#### **Overview of the Manuscript**

This chapter presented the focus and significance of this study of student self-efficacy and mentorship. Manuscript I provides a review of relevant literature, including a historic perspective, institutional influences, mentorship including faculty–student interaction, academic advising, and benefits of mentorship. Manuscripts 2 and 3 discuss methodology, empirical research, and results after completion of the study. The conclusions chapter summarizes the results and discuss the implications of the findings as they apply to the world of student services in higher education.

#### Summary

This chapter described the importance of college and the role of mentors in cultivating the self-efficacy that students need to complete it. The most recent academic work on this subject leaves much to study. Many academic professionals are in a position to mentor students, yet I have found no studies that apply mentor relational development theory to understand these relationships. The purpose of this study is to look for correlations and predictors between students' mentoring experiences and changes in self-efficacy factors in the first year of college, as reported by students in pre- and post- tests. The hypotheses are:

- Null hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is not related to student self-efficacy.
- Alternative hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is related to student selfefficacy.
- Null hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is not related to self-efficacy.
- Alternative hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is related to self-efficacy.

The quantitative data are available to study a variety of manifestations of student selfefficacy and mentorship, including social, intellectual and academic self-confidence, drive to achieve, emotional health, cooperativeness, and persistence. Further study will increase our understanding of how to cultivate this essential attribute and what activities are effective. Furthermore, we can learn how diverse students respond to mentorship activities that employ

SCT, as a strategy for cultivating success across student populations.

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Chapter 2 Manuscript I

Mentorship and Student Self-efficacy:

A Literature Review

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#### Abstract

This literature review summarizes scholarly literature on mentorship topics relevant to the experience of first year college students. It elaborates on the proposed model for studying mentorship, namely the roles, benefits and effects of time on student mentoring relationships. It develops a theoretical background for the effects and benefits of mentorship opportunities on students, including changes in self-efficacy, self-regulation, self-confidence, resiliency, buoyancy, persistence, grit, drive to achieve, and other psychosocial benefits.

*Keywords:* self-efficacy, self-confidence, intellectual self-confidence, resiliency, resilience, advising, counseling, mentoring, mentorship, student services, retention, self-regulation

#### Mentorship and Student Self-efficacy:

#### A Literature Review

The formal education of college students includes a broad spectrum of outcomes and expectations. In addition to intellectual growth and learning outcomes, students are expected to demonstrate significant personal and interpersonal competencies. These may include effective communication, values, career focus, leadership development, social responsibility, appreciation for diversity, spiritual awareness, collaboration, realistic self-appraisal, enhanced self-esteem and even satisfying, productive and healthy lifestyles (Council for the Advancement of Standards in Higher Education, 2006). Many of these outcomes lie outside of standard classroom objectives, and many students enter college without having been exposed to these expectations. Cultivating these attributes calls for considering how to bridge the gap between what students do in the classroom and who they are as people in the world. In short, we need to look at personal and individual methods for developing student success.

Self-efficacy is defined as the belief in your own ability to organize and complete a set of tasks to achieve a given goal (Bandura, 1997). It is essential to student's ability to function in the classroom, on the campus, and in life. "Your self-concept and self-esteem filter every interaction with others. They determine how you approach, respond to, and interpret messages" (Beebe, Beebe, & Redmond, 2005, p. 49). One influence that builds self-efficacy is having a mentor who helps guide development and build confidence.

Mentoring, at its core, guarantees young people that there is someone who cares about them, assures them they are not alone in dealing with day-to-day challenges, and makes them feel like they matter. Research confirms that quality mentoring relationships have powerful positive effects on young people in a variety of personal, academic, and professional situations. Ultimately, mentoring connects a young person to personal growth and development, and social and economic opportunity. Yet one in three young people will grow up without this critical asset. (Garringer, Kupersmidt, Stelter, & Tai, 2015, para. 1)

There is a mentorship gap that must be closed, particularly for the nine million young adults without mentors who face opportunity gaps (Bruce & Bridgeland, 2014). One metaanalysis of more than 73 independent mentoring programs found social, emotional, behavioral, and academic benefits to the development of youth engaged in them (Bruce & Bridgeland, 2014). Students who have a mentor are 55% more likely to enroll in college than those without mentors (Garringer et al., 2015).

With these kinds of proven benefits, colleges that seek better student outcomes would do well to look at mentorship opportunities with faculty, advisors, counselors, and staff. Academic mentoring is defined as "the involvement of post-secondary faculty, advisors, or supervisors in learning relationships oriented toward career and personal development with students, graduates, or junior faculty at the same or different higher education institution" (Schunk & Mullen, 2013, p. 362). Mentorship may be formal or informal. Informal mentorship tends to support personal development while structured mentorship is associated with academic benefits (Bruce & Bridgeland, 2014). Mentoring is a process which is intentional, nurturing, insightful, supportive and protective (Anderson & Shannon, 1988).

While faculty, advisors, counselors, and staff are available to students, their interactions may or may not develop into mentorship. Mentor relationships require satisfaction and choice on the part of mentors and protégés (Allen, Eby, & Lentz, 2006), as well as an investment of time developing the relationship (Kram, 1983). Every encounter between students and academic professionals represents an opportunity to consider mentorship. If the interaction is satisfactory, the possibility exists that the two parties involved will invest the time and grow the relationship into a mentoring one that may benefit both.
This literature review will explore mentorship opportunities in the college environment, including a short history of the roles of faculty, advisors, counselors and staff members; the benefits of mentorship to both mentors and protégés; and the development of the mentor relationship over time. The literature review will help to identify potential future research studies.

#### Purpose

This literature review has several purposes. First, it is written to establish a theoretical framework for a topic of concern (Boote & Beile, 2005). Second, it provides the rationale for specific research questions (Galvan, 2004). Third, as a prelude to any research study, it is meant to establish that the writer has command of the literature on the topic of study. This literature review is to develop a proposed model suggesting that the benefits of mentorship can be measured through a study of factors potentially available in one or more existing databases.

In this case, the topic is mentoring, and its impact on students' sense of self-efficacy. A thorough historical and contemporary review of pertinent literature is needed to establish the conceptual foundations, assessment methods, and gaps in the current body of knowledge.

## **Search Methods and Context**

This literature review grew in a snowball fashion. It began from a single resource, a dissertation on how academic advising can cultivate student self-efficacy (Erlich, 2011). Erlich's reference list identified some articles, as well as seminal literature on social cognitive theory (SCT), and self-regulated learning (Bandura, 1977b; Zimmerman, 1989). These publications provided the search terms needed to run online database searches: Bandura, Zimmerman, Schunk, self-efficacy, self-regulated, advising, academic advising, mentoring, goal setting, affective learning, modeling, and student development all yielded valuable references and insights.

The Oregon State University (OSU) and Portland State University (PSU) Library Catalogs yielded books and articles by Bandura, Gordon, Kohlberg, Schunk, and Zimmerman. Some of these seminal sources were quite old, so updated materials were sought. Citation searches were conducted on these authors using Google Scholar, looking for English language publications. Google Scholar proved to be a faster, more productive search tool than ERIC or EBSCO. With articles that cited any of these five authors, the title was reviewed to see if it was relevant to students or mentorship or advising. If the title sounded particularly salient, and it was published within the last 10 years, it was selected for closer reading. Later, I extended this to 20 years because I found older references that were still being regularly cited, and offered unique definitions. This search produced several dozen articles, of which the abstract was read. If the abstract showed it to be relevant to mentorship, advising, faculty-student interaction, student self-efficacy, student self-confidence, self-regulated learning, student resilience, grit, or buoyancy, the article was kept for closer reading and inclusion in this literature review. Those reference lists were also mined for relevant literature, which were explored using the same process. Additional authors including Kram, Crookston, and Sax were discovered this way, as well as the terms grit, resilience, and buoyancy. Further, a phone conversation with one of the authors, Richard Erlich, revealed some references that I had earlier disregarded were important to understanding construct definition and measurement.

#### **Major Themes in the Literature**

This literature review is organized to support a proposed model, namely that student mentorship may be well studied through the attributes of roles, time, and benefits. The primary premise is that students need a sense of self-efficacy to succeed in college. The review begins with a brief historic context for academic mentorship, including the evolving roles of faculty, advisors, and counselors. Mentorship is defined and explained from the perspective of Kram's mentor relationship development theory. The benefits of mentorship to students are explored through many manifestations of self-efficacy in students, including decidedness, drive to achieve, social, academic and intellectual self-confidence, cooperativeness, and mental health. Finally, self-efficacy is explained in terms of Bandura's social cognitive theory (SCT), and then as it is studied under other terms.

# **Historical Perspective**

Since the first American colleges were opened in 1636, the roles and responsibilities of mentoring students have evolved (Cohen & Kisker, 2010). Historically, faculty engaged with the student on many levels, as instructors, mentors, advisors, and resident assistants. In the 1800s, faculty began to feel pressure to concentrate on subject area expertise and student mentorship became less of a priority for them, so student services specialists were created to handle the human resources aspects of student life (Cohen & Kisker, 2010). Since then, the roles of faculty, advisors, counselors, and staff as mentors, and as educators have been ambiguous.

With the founding of the first community colleges beginning in 1901 (Brint & Karabel, 1989), access to higher education improved for women, students of color, and those of modest means (Cohen & Kisker, 2010). As diversity among student bodies increased at all institution types, so did the need for student mentorship, a need that has yet to be fully addressed (Center for Community College Student Engagement, 2014b).

**Institutional influence.** The missions, goals, and cultures of colleges influence the roles of academic professionals. For example, in the community college environment, the mission leans heavily toward both intellectual growth and career preparation (American Association of Community Colleges, 2012; Brint & Karabel, 1989). Faculty and advisors ideally support this

mission, empowering students toward independent exploration of education and career planning. College services have to demonstrate that they have relevance, value, and impact for s takeholders and customers (Lakos & Phipps, 2004). This has led to changes in college culture, now referred to as a culture of assessment, meaning that services are planned and delivered to "maximize positive outcomes and impacts for customers and stakeholders" (Lakos & Phipps, 2004, p. 352). It exists in organizations where staff members care to know what results they produce and how these results relate to customers' expectations. The mission, values, structures, and systems of the organization are supportive of learning behavior.

The pressure to show results can influence mentors' beliefs about whether they have the time to invest in mentoring relationships, and the tradeoff between work hours and measurable results is real. Having an assessment mindset means to "consciously and intentionally gather, analyze, and interpret evidence that describes their individual effectiveness and use that evidence to improve their effectiveness" (Love & Estanek, 2004, p. 90). Advising services need to be assessed both from the student and the advisor point of view (Erlich, 2011; Lakos & Phipps, 2004). These cultural shifts towards more assessment further justify the need to assess the connection between mentorship and student self-efficacy using replicable, generalizable methods.

**Changing advising philosophies.** Traditionally, academic advising was prescriptive in nature (Crookston, 1994), meaning the student was strongly persuaded toward certain areas of study (Brint & Karabel, 1989). Community colleges, for example, emphasized vocational training, yet students continued to want a traditional liberal arts education creating contradictory pressures. While academic professionals worked to meet institutional enrollment goals in their

programs, students pushed back for transfer degrees. These tensions forced changes that shaped both institutional offerings and the character of academic advising.

Developmental advising grew in contrast to prescriptive advising (Crookston, 1994). The developmental view originated in Piaget's model of childhood development (Piaget, 1926, 1928). Erikson built on Piaget's work to include development throughout a lifetime (Erikson, 1950). Kohlberg added his work on moral development (Kohlberg, 1984), and Perry (1970) studied cognitive development of college-aged young men (West, 2004). Belenky, Clinchy, Goldberger and Tarule (1986), Baxter-Magolda (1992) and others built on Perry's work to include women, broader cross-sections of populations, contexts and frameworks (West, 2004).

The developmental model grew into seven vectors that guide student development (Chickering & Reisser, 1993): (a) developing competence, (b) managing emotions, (c) moving through autonomy toward interdependence, (d) developing mature interpersonal relationships, (e) establishing identity, (f) establishing purpose, and (g) developing integrity. This framework was used to reinforce student-faculty relationships and student development services as paramount.

With this emphasis in the field, throughout the 1970's most of the advising literature reflected developmental academic advising (Hemwall & Trachte, 1999). Sometimes this referred to the counseling model, meaning an advisor was a good listener or sensitive communicator; sometimes it referred to a pedagogical model meaning an advisor used cognitive strategies; and sometimes it meant a personal growth model with advisors helping students become responsible adults. Ironically, little of the advising literature reflected students' intellectual growth and learning as a priority, and one author blamed these divergent priorities for a perceived cultural rift between faculty and student services (Hemwall & Trachte, 1999).

Frost (1991) built on Crookston (1972, 1994) and O'Banion (1972) by defining academic advising around two factors, (a) higher education provides opportunities for people to plan for self-fulfilling lives, and (b) teaching includes any experience that contributes to personal growth and can be evaluated. Where personal growth is defined to include selfefficacy, then Frost's definition helps frame the mentor's role in this study.

While advisors provide information, ideally, they also empower students to find needed information and make good decisions for themselves (Erlich, 2011). This kind of initiative is consistent with the concepts of self-efficacy (Bandura, 1977a), and self-directed learning (Zimmerman & Kitsantas, 2014). It is also related to academic self-confidence, resiliency, and buoyancy (Martin, 2013).

**Benefits of counseling and advising.** Some quantitative studies have examined the influence of counseling and advising on student outcomes. Student self-efficacy has been measured at the point of academic advising services. Advising protocols designed around Bandura's SCT and Zimmerman's self-regulated learning theory were found to be effective for developing self-efficacy in a study of 120 students (Erlich & Russ-Eft, 2012). Students and an advisor each estimated the degree to which the student understood college academic planning strategies before and after the advising intervention. All students were reported to have increased self-efficacy after completing the advising session using the SCT instruments (Erlich, 2011). Based on the varied, interrelated constructs associated with self-efficacy, it is reasonable to conclude that the same social learning processes that cultivate self-efficacy, cultivated other closely related attributes as well. These include resiliency, grit, buoyancy, decidedness, cooperativeness, and self-confidence. Figure 2.1 depicts a cycle of connected attributes, with the influence of social cognitive theory developing them all.

Powers, Carlstrom, and Hughey (2014) conducted a nationwide survey of people responsible for academic advising assessment practices to learn how academic advisors were assessing their effectiveness with students. They found that excellence in assessment meant multiple measures of student learning, sound professional judgment, and improved student learning. They found 80% of survey participants identified student learning outcomes, 50% assessed their achievement using student surveys, and 7% reported employing three or more kinds of measures. Overall, 60% reported improvements in practice and student learning as measured by their assessment practices.

The relationship between contact with advisors and resulting judgments and attitudes in students was studied at two community colleges and seven universities (Smith & Allen, 2014). The online survey garnered 22,305 responses. Measurements of five cognitive and three affective scales showed that students who contacted advisors scored higher on all outcomes. These students reported more knowledge and attitudes consistent with continuing at their institution and completing their educational programs. One of the cognitive outcomes included integration of academic, career, and life goals. Connecting students' curriculum to their personal lives, values and experiences was seen as a primary goal of liberal education, and was positively affected by contact with advisors. Students learn best when they are working to solve complex problems in cooperative groups (Kober, 2015). This kind of integration is likely to have benefited students' classroom experiences as well.

Academic advising may be at the heart of student services. Tinto (2002) explained that the essentials of student success include (a) clear and consistent information, (b) high expectations, (c) academic, social and personal support, (d) valuing of students, and (e) learning. Tinto's popular work can be compared to Bandura's (1977b) social cognitive theory (SCT), which identified four sources for growing self-efficacy (a) mastery experiences, (b) modeling, (c) persuasion, and (d) reducing affective barriers. Table 2.1 compares them. It shows how Tinto's clear and consistent information from advisors and mentors equates to Bandura's modeling. Tinto's high expectations equate to Bandura's persuasion. Tinto's support and valuing of students equates to the reduction of physiological and affective barriers, and finally, Tinto's learning equates to Bandura's mastery experiences. Table 2.1 also compares the concept of wise schooling, to be explained in further detail in the faculty-student interactions section below.

Among professional academic advisors, practices include interactions that are designed to empower students, most of them similar to Bandura's (1977b) SCT methods. Three popular practices include learned optimism, growth mindset, and motivational interviewing. Learned optimism states that people's learned self-explanatory style may be either optimistic and empowering, or pessimistic and depressing (Seligman, 1998). Seligman's strategies for overcoming pessimism include distraction from the temptation to ruminate, disputation of pessimistic narratives, and externalization of voices to prevent internalizing fault. These are methods that Bandura might describe as reduction of affective barriers.

Cultivating a growth mindset (Dweck, 2007) is also popular with academic advisors. This means understanding that we are not born with a fixed set of abilities; rather, we grow potential throughout our lifetimes. Belief in the ability to grow new talent is related to selfefficacy in that it contributes to the belief in our ability to set goals and achieve them (Bandura, 1997).

Motivational interviewing is a style of counseling that helps clients explore their own values (Wagner & Sanchez, 2002) and motivations for change (Miller & Rollnick, 2012). By using open ended questions, affirmation, reflective listening, and summaries, clients are the

source of their own strengths and abilities that make change possible. While motivational interviewing has its roots in addiction counseling, it has grown in popularity with counselors of all kinds including those at all levels of education (Ockenfels, 2014).

Academic mentoring may be formal or informal. Specifically, it involves "postsecondary faculty, advisors, or supervisors in learning relationships oriented toward career and personal development with students, graduates, or junior faculty at the same or different higher education institutions" (Schunk & Mullen, 2013, p. 362). Academic mentoring is not the same as teaching, advising, coaching, or counseling. None of them involve development of the bonded, reciprocal relationship characterized by mentorship.

# Mentorship

Definitions of mentorship revolve around three concepts, (a) interaction between two people in different roles, (b) career or instrumental benefits, and (c) psychosocial benefits. All of the definitions found agree that mentorship is interaction between people in their roles as more experienced and less experienced people. This interaction is sometimes described as a relationship, a process, training, instructing, supporting guidance, helping, dynamic, generative, developmental, and socialization (Ghosh, 2012). Anderson and Shannon (1988) identified six types of mentors:

- Traditional mentors- older figures who protect, advocate for and nurture their protégés.
- Supportive bosses- persons in a direct supervisory relationship who function as coaches and long-term protectors or advocates.
- Organizational sponsors- top level managers who see to it their protégés are promoted within the organization.
- Professional mentors- career counselors and advisors who are paid for their services.

- Patrons- individuals who use their money and status to help protégés launch their careers.
- Invisible godparents- individuals who provide help without the protégés knowing it.

Regarding career and instrumental benefits, Blackwell (1989) described mentorship as a process that included instruction, counsel, guidance, and facilitation of intellect and/or career development. Other scholars used the terms career enhancement, intense work, career counseling, organizational sponsorship, professional networks, development of specific competencies, career and professional development, career context, professional purposes, and practical craft skills (Ghosh, 2012). Yet those definitions did not include the psychosocial benefits that other literature describes. Anderson and Shannon (1988) acknowledged it as a nurturing process. Others referred to emotional support, personal development, and an engagement in constructive self-awareness (Ghosh, 2012).

**Mentor relationships develop over time.** Kram (1983) stated that mentor relationships develop over time in four sequential stages: (a) initiation, (b) cultivation, (c) redefinition, and (d) separation:

- (a) The initiation stage takes between six and 12 months. It begins as "a strong positive fantasy" (p. 614) in which the future protégé admires and respects the future mentor for competence or the ability to provide support and guidance. In time, the fantasy gains credence through inviting and supportive behavior on the mentor's part. The future protégé begins to feel cared for, supported, and respected by an admired leader.
- (b) This is followed by the cultivation stage which lasts two to five years, during which most of the benefits take place. Benefits include the protégé becoming more confident in the ability to navigate the organization and succeed at challenging work,

and the mentor feeling pride and satisfaction from seeing them succeed.

- (c) The separation stage lasts from six months to two years, and is characterized by growing autonomy. There may be some counseling, coaching, and sponsorship, and mentors begin to feel both pride and loss as their protégés outgrow them.
- (d) During the final stage of redefinition, friendship and collegiality may develop between them. They may become peers, or may have no further contact as they move on in life.

Mentorship and SCT. Scandura and Ragins (1993) created a 15 item measure of mentoring functions, including three basic factors. They consisted of role modeling, career mentoring, and psychosocial mentoring. These factors overlapped three of Bandura's four factors of social cognitive theory, specifically role modeling, persuasion toward career decisions, and reduction of affective barriers/ encouragement/ psychosocial support. Scandura and Ragins' correlated data from this instrument with the Spence Personal Attributes questionnaire (PAQ) to find how feminine and masculine gender role orientations influenced mentorship. Their final sample included 833 CPAs, 66.4% of them male, with an average age of 30 years old. They found that individuals selected as protégés tended to be assertive and outgoing organizational members who were viewed as having high potential. Dimensions inherent in feminine gender role orientations were found to possibly handicap individuals from initiating a mentor relationship. Limitations of this study included that it took place in a business environment and not an academic one. The larger proportion of males was also a weakness. Yet the study provides food for thought about how mentor relationships are initiated and for whom.

Scandura and Ragins' (1993) work was updated by Allen, Eby, and Lentz (2006) who studied 175 protégés and 110 mentors from four different organizations with formal mentoring programs. They administered the Scandura and Ragins three factor instrument via a web-based survey to measure mentoring functions. They learned that when protégés and mentors have a voice in the choice with whom they are matched, they score higher in quality, psychosocial support, and modeling. Protégés preferred mentors who were in the next position to which they most immediately aspire, affirming that identification is necessary for mentors to be effective role models. They also felt that they benefited by having regular meetings and by setting goals and objectives together. Physical proximity facilitated interaction and developed stronger psychological ties between mentors and protégés. Differences in rank were important to facilitating career mentoring and role modeling, such as visibility, exposure, sponsorship, insight, and perspective.

A strong correlation was found between self-efficacy and career related mentorship in Paglis, Green, and Bauert's (2006) study of a cohort of 130 doctoral students in 24 different academic departments at a research-one, land-grant university in the Midwest. Research experience, career commitment, and mentorship were all positively correlated to higher selfefficacy. Regression analysis showed psychosocial mentoring positively influenced subsequent research self-efficacy. Advisors' collaborative mentoring, measured at the end of program year two, predicted protégés research productivity four years later. Some limitations included that students were from hard sciences, which may not reflect the experience of liberal arts students, or even that of undergraduates. This study used career related industry standards, so construct definitions and measurements would need further development for mentoring in academic contexts. This study underscored the need for longitudinal studies on mentoring in academia, rather than cross-sectional or retrospective studies. **Mentorship through faculty-student interactions.** History has shown, as described earlier, that the roles of faculty, advisors, counselors, and staff have shifted over time. Currently, there is much ambiguity regarding who has the responsibility to mentor students, and the culture of assessment certainly has influenced priorities. Although much data have been collected about student interaction with faculty (Center for Community College Student Engagement, 2014a; Crisp & Cruz, 2009; Sax, Bryant, & Harper, 2005), the role of faculty in counseling, advising, and mentorship of students varies from campus to campus and continues to be ambiguous. Yet several studies show faculty mentoring to be a positive factor in student retention.

McArthur (2005) found faculty mentoring to be a significant positive factor in student retention based on a survey of 222 students in one community college. This research evaluated whether increased interaction between faculty and students in the form of developmental academic advising affected student persistence. Faculty in the arts and humanities department received specialized advisement training from a developmental education counselor, and students were sent a postcard with a faculty advisor's name. A general survey revealed that the arts and humanities students who received the postcard had a higher sense of awareness of faculty advising and had positive things to say about their experience with their faculty advisor. While retention figures for this department had lagged the college in the past, it increased by 15% to exceed the college retention rate by 3%. When retention is counted as a reflection of student success, this campaign to put students in the way of mentoring opportunities through faculty advising clearly had positive effects on student self-efficacy.

In rural New York state, Halpin (1990) studied a 381 member cohort for factors influencing persistence. Students reported that interaction with faculty was a significant factor in academic integration. Faculty concern for teaching, and student, academic, and intellectual development were also identified as factors in the persistence of 289 students who continued school to the second semester.

Eagen, Herrera, Garibay, Hurtado, and Chang (2011) studied the influence of faculty mentorship on STEM students. They found that developing such a relationship was positively associated with meeting with an advisor/counselor about career plans, asking professors for advice after class, feeling that faculty are interested in students' personal and academic problems, and being satisfied with the racial/ethnic diversity of the student body. They concluded that mentoring is a tool that can be used to address racial disparities in STEM programs.

While faculty can provide students with intellectual challenge, stimulation, and respect, faculty encounters were not all necessarily beneficial, and they may be interpreted differently by men and women (Sax et al., 2005). Sax et al. studied a longitudinal sample of 17, 637 students who took the Cooperative Institutional Research Program (CIRP) survey upon entry to college in 1994 and again in 1998. They found that "dismissive comments made to female students can have deleterious effect on their academic confidence and sense of physical well-being" (p. 655). This study reinforced the importance of positive encouragement to reducing affective barriers, consistent with social cognitive theory (SCT), as we will see below.

Ethnicity also affects mentoring interactions. Lundberg and Schreiner (2004) studied faculty interaction by student race and ethnicity in a sample of 4,501 students. They reported student satisfaction with faculty was a function of behaviors that build self-efficacy, namely being approachable, helpful, understanding, and encouraging. While the quality of faculty relationships predicted learning for all ethnic groups, it differed by ethnicity. Quality of faculty relationships was the strongest predictor of learning for students who identified as Asian/Pacific Islander, Mexican American and Native American students; second strongest for African American, other Hispanic, Puerto Ricans, and multiethnic students; and third for White students. Their study validated that faculty behavior consistent with SCT supports student satisfaction and learning.

The concept of wise schooling (Steele, 1997) overlaps SCT. Wise schooling is a set of principles that reduce the experience of stereotype threat among students who are underrepresented minorities. The principles of wise schooling include: (a) optimistic faculty interaction, (b) challenging work, (c) expandability of intelligence, (d) affirmations of intellectual belongingness, (e) valuing multiple perspectives, and (f) successful role models who have overcome stereotype threat (Antony & Taylor, 2000). These principles are compared to Bandura's SCT, as well as Tintos five factors of student success in Table 2.1. While wise schooling reflects very similar needs, it centers on faculty as role models, so is mentioned in this section again.

## **Cultivating Self-efficacy**

Bandura (1977a) described the role of perceived self-efficacy as a filter between the person and the person's behavior. In other words, if people believe they can succeed at something, they are more likely to take independent action. "Efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experiences. The stronger the perceived self-efficacy, the more active the efforts" (p. 194). The following section will begin by describing social cognitive theory. It will then turn to some related concepts: (a) decidedness and drive to achieve, and (b) grit.

**Social cognitive theory (SCT).** Bandura (1977b) outlined four principal sources of information that people use to judge their level of personal efficacy (a) performance accomplishments, (b) vicarious experience, (c) verbal persuasion, and (d) physiological and affective factors, also referred to as emotional arousal. In 1986, social learning theory was expanded and renamed social cognitive theory (SCT) (Bandura, 1986). In addition to personal

factors, SCT acknowledged the role of behavioral outcomes as well as the environment on selfefficacy.

In some of the literature, SCT is described as a three part process, with persuasion and reduction of affective barriers combined as one source. By some definitions, the act of convincing someone is an affective process, but this is not always the case (Grice & Skinner, 2013). For example, it is possible to persuade someone on an intellectual level and have them remain emotionally and behaviorally reluctant. As explained later in SCT, it is also possible for a reduction in affective barriers to come from environmental influences. For this reason, SCT theory is described below as having not three but four parts.

Performance accomplishments are the first influences on self-efficacy, and are also called mastery experiences, resulting in confidence that grows based on having successfully completed a valuable task. Mastery experiences engage somatic learning, which is knowledge that comes to us via the body, such as a feeling of elation, a panic attack, or the cultivated muscle memory of a pianist (Merriam & Caffarella, 1999). When the body's response to an experience is comfort, satisfaction, or pride in accomplishment, self-efficacy grows. Successes raise mastery expectations and repeated failures lower them, particularly if disappointment happens in early efforts (Bandura, 1977a).

Vicarious experiences are the second source of self-efficacy, also called modeling. Modeling refers to the act of observing other people, and learning from what is seen. Bandura (1977b) wrote,

Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action. (p. 22)

By watching mentors and role models, students form ideas about how successful students and professionals behave and the consequences of that behavior, and this knowledge serves as a guide for action later. Students benefit, for example, when advisors and counselors model the research skills necessary to explore and select career and training opportunities (Erlich, 2011).

Verbal persuasion is the third source of self-efficacy and is defined as any communication act designed to influence either beliefs or actions (Grice & Skinner, 2013). People respond to constructive encouragement from each other, leading them to believe they can succeed at what may have once been overwhelming (Bandura, 1977a). Mentors with the effective communication skills to affect protégés this way are said to have the personal characteristic of persuasive power (Engleberg & Wynn, 2010).

Emotional health and physiological states are responsible for the fourth source of selfefficacy. Also called emotional arousal and reduction of affective barriers, it is important because successful effort results in feelings of relaxation, and biofeedback encourages greater self-efficacy (Bandura, 1977b). Body, mind, and emotions are connected in the learning experience (Merriam & Caffarella, 1999). Feelings of stress threaten self-efficacy, because high stress arousal usually debilitates performance (Bandura, 1977a). Self-efficacy is experienced as a physical, mental, and emotional state internal to the learner, and it is sensitive to the influence of referents in the social environment (Litrico & Choi, 2013).

**Decidedness and drive to achieve.** Decidedness and self-confidence are additional terms for self-efficacy, and are closely related to the drive to achieve. In work by Bullock-Yowell, McConnell, and Schedin (2014), self-efficacy was measured as a function of career decidedness through administration of the Career Decision Difficulties Questionnaire (CDDQ). "Decision making of any type has been described as a thought-provoking function that requires

a selection of an alternative among several options" (p. 24). In their survey of career plans, 223 students were asked to free-write what careers they were considering. Students with more ideas were seen as more uncertain, showing less career self-efficacy. Both decided and undecided students were willing to make a decision, but undecided students struggled with negative career thinking and lack of information. Implications for academic advising centered on the power of Bandura's four methods of increasing self-efficacy: personal performance, vicarious learning, social persuasion, and physiological and affective states. While this study included mostly female subjects, and the influence of gender was controlled for, the authors questioned whether conclusions should be generalized to populations with more males. Due to recruiting challenges, the sample also included an uneven number of participants in decided and undecided groups. "Balance means having the same number of experimental units in each treatment group" (Ramsey & Schafer, 2002, p. 234). While balance is not considered essential, studies with unbalanced control samples should be interpreted with caution.

Self-regulated learning builds on the concept of self-efficacy and is defined as the set of processes that learners use to activate and maintain cognitions, emotions, and behaviors to attain personal goals (Zimmerman & Kitsantas, 2014). Students who feel self-efficacious persist at tasks, are motivated to achieve, and use effective self-regulatory strategies to learn (Davis, 2008; Schunk, Pintrich, & Meece, 2008). It includes applying and adjusting strategies to attain goals, cognitively monitoring progress, maintaining motivation and positive effects, and utilizing social and environmental resources (Schunk & Mullen, 2013). "Students who focus on learning processes surpass the attainment of those who focus on performance outcomes" (Zimmerman & Kitsantas, 2014, p. 246). Self-regulation was found to be a better predictor of academic success than self-discipline and should be seen as essential to academic

ability. This would suggest that helping students build their self-regulation skills also builds self-efficacy with regard to the processes of higher education and will support college completion.

Grit. Resiliency and buoyancy are additional terms that describe abilities to overcome adversity and achieve goals (Martin, 2013). Studies of student resilience have included Bandura's four sources of self-efficacy (Bandura, 1977a). Clauss-Ehlers and Wibrowski (2007) defined student resilience as the ability to overcome difficulties and succeed in school. The authors studied 95 starting freshman who participated in a six-week summer Educational Opportunity Fund program featuring regular meetings with a counselor. The Conner-Davidson Resilience Scale was used as both pre- and post-test, and measured the impact of counselors on various aspects of student resilience. Their findings from the 25 item survey included six questions that represented all four factors that contribute to self-efficacy: (a) mastery experiences, (b) modeling, (c) persuasion, and (d) affective factors. Table 2.2 was created by this author to identify the portions of their study which amounted to an embedded study of self-efficacy. They concluded that educational resilience can be cultivated through strong, consistent, supportive counseling services. Their results showed that access to supportive counselors also develops self-efficacy, and that self-efficacy is a significant factor in student resilience.

Academic resiliency has been distinguished from academic buoyancy in terms of the duration of challenges faced. Martin (2013) defined resilience as "the capacity to overcome acute and/or chronic adversity that is seen as a major threat to a student's educational development" (p. 488). Academic buoyancy was defined as "a capacity to overcome setbacks, challenges, and difficulties that are part of everyday academic life" (p. 488). We can see by

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these definitions, differing in terms of short term and long term problem solving, that selfefficacy, buoyancy, resilience, and self-regulation are all related to a sense of self-confidence in one's ability to get things done. Martin (2013) used the Motivation and Engagement Scale (MES) of negative engagement factors to measure buoyancy and resilience. This study distinguished the difference between buoyancy meaning overcoming short term problems, and resilience meaning overcoming long term problems. The sample consisted of 918 students, 42% females and 58% males, from nine high schools in four major cities in Australia. Dependent variables included anxiety, failure, avoidance, uncertain control, self-handicapping, and disengagement. Results showed that a two-factor model fit the data better than a one-factor model, supporting the uniqueness of buoyancy and resilience. This identified a difference between students dealing with low level short term challenges such as experiencing setbacks at school or negative feedback on work and those who were dealing with high level long term challenges such as failing a subject, expulsion, and having a learning disability. Yet these two factors shared approximately 35% variance, showing significant overlap. The weaknesses of this study were the self-report and cross-sectional nature of the data. Self-reported data could be strengthened by also collecting information in other ways such as observation of students' responses to setbacks and their implications for academic outcomes. Cross-sectional data could be reinforced through longitudinal methods to support preliminary claims about how buoyancy and resilience are conceptualized as contrasting ideas. Martin concluded that "resilience is a dynamic process reflecting an interaction between the context and the individual" (p. 497), and buoyancy must be prioritized as a means of dealing with everyday adversity to position the student for academic resilience should major adversity arise.

### **Implications for Practice**

The results of these various studies suggest that advisors, counselors, staff, and faculty can all serve as mentors to students, and that doing so can positively affect students and institutions. Both formal and informal mentoring have been shown to benefit students. This suggests that institutions may cultivate student success both through the informal, one-on-one interactions of mentors and students, as well as through the establishment of formal programs. Formal programs may pair mentors with protégés, require meetings to review goals and strategies for success, as well as implement program assessment methods.

Time spent with students is a valuable resource and requires the use of many facilities, including the use of offices, labs, gyms, and other infrastructure, as well as materials and technology to facilitate research on career and education options. Yet on many campuses, these resources are in short supply. Many colleges and universities rely on part-time faculty who are not on campus enough to accommodate students, nor do they have private offices in which to meet (Kezar, Maxey, & Badke, 2012). Expanding mentorship opportunities could mean examining allocation of these resources.

Where mentorship is taken seriously, the culture of assessment will require measurable investments and outcomes. Resources must be committed, and goals must be monitored. The work of collecting these data must be reasonable compared to the expected benefits to students. Finally, training in effective mentorship would identify behaviors associated with improved student outcomes, and cultivate best practices.

#### **Implications for Research**

In light of Erlich's academic advising study that showed evidence of immediate improvement in student self-efficacy, it is not clear whether Kram's stages of initiation and 39

cultivation estimate properly when the benefits of mentorship begin to take place for students, possibly much sooner than the six to12 months proposed in mentor relationship development theory (Kram, 1983). There are only a few studies addressing what mentorship behaviors are effective at cultivating student self-efficacy, and what metrics measure effectiveness. In some studies, the concept of self-efficacy has to be extrapolated from other cognates, such as resilience.

There are a number of ways to further our understanding of academic mentorship, using both qualitative and quantitative methods. The model presented in Figure 2.1 provides a starting point. One could examine databases existing within individual institution or at the state or national level to identify variables measuring the suggested factors and then use those data to test the model. Another suggestion would be to undertake a replication of Erlich's work (Erlich, 2011; Erlich & Russ-Eft, 2011, 2012, 2013). Such a replication could be undertaken on a different campus with a different population of students, or it could be undertaken on multiple campuses.

Having examined some of the effects and benefits of mentoring, some longitudinal studies would be valuable. For example, a longitudinal study of faculty-student interactions could examine communication behavior associated with successful mentoring. Videotaped mentoring sessions could capture nonverbals and micro-expressions associated with successful modeling. In addition, a study examining the long-term outcomes for students who have received faculty mentoring could be compiled. Time spent with mentors and satisfaction with those interactions could be used as independent variables to measure their impact on student self-confidence, grades, and persistence.

The role of staff members as mentors is understudied, yet shows promise as a source of student support. O'Banion (2013) called on staff to commit to the efforts of student success and completion. A study of frequency of contact between students and staff, as well as student satisfaction with those interactions, could reveal the development of mentoring relationships. By correlating these factors to student self-efficacy and grades, this could show the influence that staff relationships have on student success.

Finally, formal and informal mentorship programs both appear to benefit students, yet the difference between them is the degree of freedom of choice that mentors and protégés have. Formal mentorship programs often assign the pairing and require a certain number, length, and duration of meetings. A study could be done comparing the student success factors in formal and informal mentorship programs. This could reveal how important freedom of choice is to the benefits of having a mentor on campus.

#### Conclusion

Self-efficacy is an essential attribute for students to succeed. The body of knowledge describes this attribute under various terms, including self-confidence, self-regulation, grit, resiliency, buoyancy, and decidedness. A variety of mentorship behaviors on the part of faculty, counselors and advisors, influence students' sense of self-efficacy. The process of mentorship appears to be consistent with Bandura's SCT, which identifies modeling, mastery experiences, persuasion and reduction of affective barriers as cultivators of self-efficacy. The history of higher education indicates fluidity in which academic professionals are responsible for mentoring students, including faculty, counselors, advisors, and staff members. A variety of student factors affects how they will respond to mentorship, and the body of knowledge about mentorship and student self-efficacy is

somewhat fragmented. Much mentoring scholarship was developed in the business world, and the results need to be tested and adapted to the academic environment.

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Table 2.1

Social Cognitive Theory (Bandura, 1997)	Wise Schooling (Steele, 1997; Antony & Taylor, 2000)	Factors of Student Retention (Tinto, 2002)
Modeling	Successful role models who have overcome stereotype threat	Clear and consistent information from advisors and mentors
Persuasion	Optimistic faculty interaction Valuing multiple perspectives	High expectations
Reduction of physiological and affective barriers	Expandability of intelligence Affirmations of intellectual belongingness	Academic, social and personal support Students must feel they are
Mastery experiences	Challenging work	valued Learning must be taking place

# Table 2.2

Self-Efficacy Factors Found in a Study of Student Resilience (Clauss-Ehlers & Wibrowski, 2007)

Benefits of interaction with counselor	Percent of students reporting this	Mode of self-efficacy development
Supportive but also helped them be independent	96.0%	Reduction of affective barriers to success
Helped them feel more optimistic	95.8%	Reduction of affective barriers to success
Functioned as a role model	93.7%	Modeling desired behaviors
Helped them take responsibility for doing well in school	90.5%	Mastery experiences
Helped change their outlook on life	90.5%	Persuasion
Helped them feel confident about their ability to be successful in school	83.1%	Reduction of affective barriers to success

Created by the author for this study



Figure 2.1. Social cognitive theory (SCT) cultivates inter-related concepts of self-efficacy

Chapter 3 Manuscript II

Self-efficacy: A Multi-faceted Attribute of Student Success

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#### Abstract

Bandura's Social Cognitive Theory served as a guiding framework for exploring student self-efficacy in college freshmen. Self-efficacy is also described as self-regulated learning, buoyancy, resiliency, and self-confidence. A nationwide survey of over 15,000 students provided self-report scores for six kinds of self-confidence including academic, intellectual, social, cooperativeness, drive to achieve, and emotional health. Exploratory factor analysis was conducted on pre-test data to look for overlapping concepts and multi-collinearity. Results from pre-freshman year surveys showed that while some of the self-efficacy factors overlapped, their Cronbach's alpha scores were too low to be considered reliable parts of the same factor. Factor analysis was repeated on post-freshman year data. Five items factored together including intellectual self-confidence, social self-confidence, cooperativeness, drive to achieve, and emotional health. Academic self-confidence was a separate factor from Intellectual selfconfidence in both pre-and post- data. This study concluded that student self-efficacy is a multifaceted attribute which changes over the course of time. Cooperativeness grew over the course of the freshman year and contributed powerfully to the five factor self-efficacy latent variable evident at the end of the freshman year, possibly indicating a synergistic effect from developing cooperativeness. This study may have ramifications for educators in understanding how student self-confidence grows. Furthermore, it provides implications for student success and suggestions for future research in predicting student self-efficacy.

**Keywords:** Social Cognitive Theory, self-efficacy, student self-confidence, resiliency, buoyancy, self-regulation, intellectual self-confidence, social self-confidence, academic self-confidence, cooperativeness, drive to achieve, emotional health.

## Student Self-efficacy, a Multi-faceted Attribute

College freshmen face a difficult year, and many of them feel overwhelmed as they adapt to the culture and expectations of higher education (Perloff, 2003; Pryor, De Angelo, Blake, Hurtado, & Tran, 2011; Tinto, 2002). Up to 40% of college students will leave college before completing a degree (DeBerard, Spielmans, & Julka 2004), with 75% of them leaving during their first two years of college (Tinto, 1987). Of the students who persist, many of them experience stress, anxiety, and depression while struggling to finish school. While some students' self-efficacy is challenged by the need for support (Rivera, 2014; Tinto, 2002) and executive skills, (Bellafante, 2014), others struggle mentally or emotionally (Sax, Bryant, & Harper, 2005), leading to a variety of challenges in school (Hjortshoj, 2001; Storlie, Moreno, & Portman, 2014). Community surveys indicated that students have a much higher incidence of psychological distress at 41%, than the general population at 22% (Currie, McGrath, & Day, 2010). Many students felt so depressed that it was difficult to function (Wilson, 2015). Furthermore, suicide was the second-leading cause of death among college students in the U.S. after accidents (Wilson, 2015), and colleges have struggled to meet the mental health needs of students (Currie et al., 2010; Fabris, 2015; Howard, 2015; Patel, 2015a; Wilson, 2015). Clearly, there is a crisis of student self-efficacy that threatens student success (Center for Community College Student Engagement, 2014b; Davis, 2008; Zientek, Ozel, Fong, & Griffin, 2013) as well as institutional goals (Bailey, Jaggars, & Jenkins, 2015; O'Banion, 2010).

This study of student self-efficacy is inspired by the freshmen who struggle to find their place in college and struggle to believe in their ability to succeed. We examined surveys completed by over 15,000 college freshmen nationwide to better understand the nature of self-efficacy as an essential attribute of student success.
#### **Literature Review**

Self-efficacy is defined as having a belief in one's ability to organize and execute actions necessary to achieve a goal (Bandura, 1977b). Cognitive, motivational, affective, and decisional processes are affected by self-efficacy beliefs (Bandura, 2012) which correlate positively with academic functions such as math problem solving, writing, and reading (Zimmerman & Kitsantas, 2014).

Self-efficacy is presented in the literature under many names as an overarching attribute of student success, namely (a) self-confidence (Albritton, 2012; Belenky, Clinchy, Goldberger, & Tarule, 1997; Erlich & Russ-Eft, 2011), (b) academic self-confidence (Sax et al, 2005; Schunk, 1990), (c) drive to achieve (Sax et al., 2005), (d) emotional health (American School Counselor Association, 2014; Sax et al., 2005), (e) self-regulation (Schunk, Pintrich, & Meece, 2008), (f) resiliency (Clauss-Ehlers & Wibrowski, 2007; Rivera, 2014), and (g) buoyancy (Martin, 2013). These self-beliefs reduce fear of the unknown (Rennick, 2005), increase expectations of success (Schunk, 1990), and affect the ability to cope with challenges once efforts have been initiated towards a goal (Zimmerman & Kitsantas, 2014). "Efficacy expectations determine how much effort people will expend, and how long they will persist in the face of obstacles and aversive experiences" (Bandura, 1977b, p. 80). Students who persist will gain experiences that further reinforce their sense of self-efficacy (Erlich & Russ-Eft, 2011; Zimmerman & Kitsantas, 2014) and further reduce fears and defensive behavior in a productive, self-regulatory learning cycle (Schunk & Mullen, 2013).

Academic self-confidence (Sax et al., 2005; Schunk, 1990) is presented in the literature many ways, including as a composite of academic ability, drive to achieve, mathematical ability, writing ability, and intellectual self-confidence (Astin & Sax, 1998). One study of

students in a developmental math class showed that students' beliefs about self-efficacy and cooperation predicted grades (Zientek et al., 2013).

Academic well-being and social well-being are equally important to school success (American School Counselor Association, 2014). Social self-confidence (Astin & Sax, 1998), intellectual self-confidence (Sax & Harper, 2005), and emotional health (Sax et al., 2005) are commonly measured as separate attributes, or sometimes together, yet they all appear to develop in students through the same process.

Bandura's social cognitive theory (SCT) (1977a,b, 1986, 1996, 2012) explains how these attributes change. SCT describes four influences that affect self-efficacy, and it serves as the theoretical foundation for this study of college freshman.

## **Social Cognitive Theory**

SCT states that self-efficacy grows from, (a) mastery experiences, (Brint & Karabel, 1989), (b) modeling from influential people, (c) verbal persuasion, and (d) the environment (Bandura, 1977a). This subsection will summarize these four influences as they apply to the college freshman.

**Mastery experience** refers to prior success. Students with prior success in school can be expected to have higher self-efficacy and higher levels of aspiration than those who have struggled with school in the past (Schunk, 1990). The freshman year is challenging, and entering with a certain amount of academic and intellectual self-confidence helps. Early encouragement by faculty, staff, and other opinion leaders further develops the students' belief in their ability to succeed (Lundberg & Schreiner, 2004). For new college students, prior success may be evidenced by high school grades (Hurtado, Newman, Tran, & Chang, 2010).

**Modeling** refers to the influence of any person whose example provides vicarious experience (Bandura, 1977b).

Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action. (Bandura, 1977b, p. 22)

On the college campus, these role models may include faculty (Bryant, 2011), advisors (Bullock-Yowell, McConnell, & Schein, 2014; Erlich & Russ-Eft, 2013; Paglis, Green, & Bauert, 2006), counselors (Clauss-Ehlers & Wibrowski, 2007), staff (Davis, 2008), graduate teaching assistants (Kober, 2015), peers (Center for Community College Student Engagement, 2014b), student mentors (Rennick, 2005), other mentors (Schunk & Mullen, 2013), bosses (Salisbury, Pascarella, Padgett, & Blaich, 2012), and any other person the student may have observed.

**Persuasion** is a communicative effort to reinforce, modify, or convince other people's attitudes, behaviors, beliefs, opinions, or values (Coopman & Lull, 2012; Perloff, 2003). Persuasion is different from modeling in that it constitutes an explicit targeting of a new idea for adoption. Through persuasion, people can be encouraged to try things of which they are unsure and grow as a result of those experiences (Bruce & Bridgeland, 2014; Bullock-Yowell et al., 2014; Erlich & Russ-Eft, 2011). This is a form of encouragement that reduces affective barriers (Antony & Taylor, 2000; Lundberg & Schreiner, 2004; Steele, 1997)

The environment also influences self-efficacy. Campuses may be structured or laid out in ways that influence how students feel about their ability to get around, access services, solve problems, and otherwise succeed on campus (Strange & Banning, 2001). Institutions of higher education express different expectations and philosophies about student autonomy (Brint & Karabel, 1989; Cohen & Kisker, 2010a; Kezar, 2000). Public policy influences the educational environment. And it can drive goals that may or may not be oriented toward the personal needs of students (Center for Community College Student Engagement, 2014b; Oregon State Board of Higher Education, 2014; Oregon University System, 2012; Tidwell, 2014).

Campus culture is part of the environment, and how students engage with it affects their self-concept (Fabris, 2015). College is an intensely social experience (Kober, 2015; Tinto, 1998), and social self-confidence can give students a toe-hold on managing potential role models (Sax et al., 2005), as well as making the most of the diverse atmosphere of campus life (Astin & Sax, 1998; Crisp & Nora, 2010).

Campus culture is influenced interpersonally through the process of diffusion of innovations (Rogers, 2003). New ideas spread from person to person via opinion leaders, to early adopters, to late adopters, until the new ideas become mainstream in the given culture, and are therefore no longer new ideas. Campus culture is created in part through this process of persuasion.

Classroom norms are changing toward more interaction between students and instructors. Educational technology has given rise to the flipped classroom (Bailey et al., 2015) where the classroom can emphasize workshopping, concrete learning (Kolb & Kolb, 2005), and connected learning (Tinto, 2002). While there is still much didactic lecturing in the classroom (Baxter-Magolda, 2008), current educational trends emphasize collaborative learning (Barkley, Cross, & Major, 2005; Tinto, 1998), learning communities (Lave & Wenger, 1991; Tinto, 2003, 2011), communities of practice (Wenger, 2009), and other interactive styles in the classroom (Kober, 2015).

Simply put, the more students are academically and socially engaged with faculty, staff, and peers, especially in classroom activities, the more likely they are to succeed in the classroom. Such engagements lead not only to social affiliations and the social and

emotional support they provide, but also to greater involvement in learning activities and the learning they produce. Both lead to success in the classroom. (Tinto, 2011, p. 3)

These trends reflect the importance of social self-confidence and cooperativeness, attributes that are relevant to college, work, and life (Engleberg & Wynn, 2010).

**Reduction of affective barriers.** There is an epidemic of anguish among students according to the *Chronicle of Higher Education* (Wilson, 2015). Anxiety and depression are common on campus (Patel, 2015b). College freshmen feel overwhelmed and report low self-efficacy in emotional health (Pryor et al., 2011), all while undergoing the major life transition between high school and college (O'Banion, 2013; Tinto, 2011). Emotional struggles are a barrier to self-efficacy (Arnsparger & McClenney, 2012; Bandura, 2012; California Community Colleges Student Success Task Force, 2012; Pryor et al., 2011) as well as student success (DeBerard, Spielmans, & Julka, 2004; Steele, 1997). Without the belief in the ability to achieve a goal, the individual has little incentive to try (Bandura, 1977a).

Academic buoyancy has been defined as the capacity to overcome the everyday setbacks and challenges of school (Martin, 2013). Anxiety, fear of doing poorly, and uncertainty about how to do well are emotional barriers to self-agency. Educational resilience is associated with overcoming major negative outcomes such as self-handicapping and disengagement. It pertains to students who have struggled academically in the past but were able to overcome difficulties and succeed in school (Clauss-Ehlers & Wibrowski, 2007; Martin, 2013). Students who know themselves as having emotional health are more likely to overcome self-doubt and possess the buoyancy and resiliency necessary for succeeding in school.

Student self-efficacy is measured in a variety of overlapping ways, all of which may be influenced by similar social cognitive processes. It is not clear whether all of these measures refer to the same attribute or if they are different attributes of student success. This study is motivated by the urgent need for first year students to engage in activities that support health and well-being (Pryor et al., 2011), make significant human connections as early as possible (Arnsparger & McClenney, 2012; Center for Community College Student Engagement, 2014b; O'Banion, 2013), and develop the confidence they need to finish college.

### **Research Purpose and Hypotheses**

Using SCT, it is clear that freshmen's sense of self-efficacy is an essential factor to success during the crucial transition to college life. The purpose of this study was to identify any underlying factors for these six measures of student self-confidence, (a) Academic ability, (b) Intellectual self-confidence, (c) Drive to achieve, (d) Social self-confidence, (e) Cooperativeness, and (f) Emotional health. These six were selected for their similarity to the overarching competencies described in the literature which students need to set goals, organize action, and achieve completions. This study adds to the body of knowledge by clarifying the nature of student self-efficacy. The research question is: how are these six aspects of student self-efficacy related, namely academic self-confidence, intellectual self-confidence, drive to achieve, social self-confidence, cooperativeness, and emotional health?

#### **Design and Methods**

This study used exploratory factor analysis (EFA), a method of analysis used to account for relationships among items (Harrington, 2009). "EFA is based on the common factor model, where each observed variable is a linear function of one or more common factors (i.e. the underlying latent variables) and one unique factor (i.e., error- or item-specific information)" (Harrington, p. 9). This section describes the instrument, sample population for study, and method of analysis. The following sections describe the findings and calculations, along with discussion, implications for practice, suggestions for future research, and conclusion.

### The Instrument

This study analyzed two sets of freshmen surveys from 2012 and 2013 completed by 15855 students from eight kinds of two and four year institutions nationwide (Table 3.1) (Higher Education Research Institute, 2014b). The data set came from the Higher Education Research Institute (HERI), which annually administers two surveys: (a) The Freshman Survey (TFS) before the beginning of the school year (Higher Education Research Institute, 2014a), and (b) Your First College Year Survey (YFCY) one year later (Higher Education Research Institute, 2014c). The surveys are considered highly reliable and valid (Pryor et al., 2011), and they are used by colleges and universities nationwide to fulfill institutional accreditation requirements (Stolzenberg, 2015).

Students' responses between the time they enter as freshmen to the end of their first year of college were connected by their student identification number, making longitudinal study possible. TFS included a wide range of incoming student characteristics such as demographics, high school achievement and activities, values, attitudes, beliefs, and self-concept (Higher Education Research Institute, 2014a). YFCY provided the follow-up questions. Students responded to questions about their self-confidence in six areas including academic ability, intellectual self-confidence, social self-confidence, drive to achieve, emotional health, and cooperativeness (Higher Education Research Institute, 2012).

## **The Population**

The sample population consisted of 15,855 freshmen at public and private four year colleges and universities, Catholic, religious (not Catholic), and nonsectarian four year colleges, as well as a few students from public and private two year colleges (see Table 3.1). Almost all students provided information on their ethnic backgrounds, revealing an ethnic composition that

was 65% White, 12.4% Asian, 10.7% mixed, 6% Hispanic, 4.5% Black, 1.3% Other, and .1% American Indian.

Regarding gender, participants identified as 64.1% as Female and 35.9% Male. Fortythree respondents, or .3% of the sample did not answer. This population included far more women than men. The ambiguous "Did not answer" population is too small for any meaningful analysis and so were eliminated. The response choices did not express whether the 43 individuals are intersex, other versions of gender ambiguity, or if they withheld their gender identity for personal reasons. With growing concern for gender minorities in society, this author would have liked to study the self-efficacy of these populations and counts this as an area for needed data and future research.

### **Analysis of Self-efficacy Data**

This sample population rated itself on "Academic ability," "Drive to achieve," "Intellectual self-confidence," "Social self-confidence," "Cooperativeness," and "Emotional Health" on five point scales, with 1 being Lowest 10%, 2= Below average, 3 = Average, 4 = Above average, and 5 = Highest 10%. The most common answer on TFS was 4, indicating that most new freshmen see themselves as above average in these measures. Skewed data are common in educational scores and surveys (Ho & Yu, 2015) and should be critically addressed. So tests of normality were run and showed all self-efficacy variables to be within conservative tolerances, meaning maximum skewness of three and kurtosis of 10 (Kline, 2011). Missing data were also within acceptable tolerances (Eagan, 2015; Harrington, 2009), and considering the size of the database, loss of power was not of concern. Therefore, listwise deletion was selected as the most optimum method for dealing with missing data. Answers were paired before and after the freshman year, reflecting a very slight decrease over the course of the year in five of six aspects of self-efficacy (Table 3.2). The only slight increase was in "Cooperativeness". A paired samples T test indicated that while the changes were slight, they were statistically significant. Decreases in Social self-confidence were significant with a p value of .037, and changes in all other self-efficacy variables were significant at less than .001.

Three rounds of exploratory factor analysis were then conducted on incoming freshman self-efficacy scores to identify any relationships among the six aspects of self-efficacy. Factor analysis can reduce the number of variables, avoid multicollinearity, and increase the parsimony of the model (Gredler & Schwartz, 1997; Harrington, 2009). Principal axis factoring, one of the most popular methods in exploratory factor analysis, has some advantages over other methods when population solutions have few indicators/items per factor (de Winter & Dodou, 2011). It was completed using Promax rotation with SPSS software. The six aspects analyzed were, "Intellectual self-confidence," "Social self-confidence," "Drive to achieve," "Mental health," "Cooperativeness," and "Academic ability."

**Pre-freshman year.** In the first round, two factors loaded: one around "Intellectual selfconfidence" and one around "Academic ability" (Table 3.3). The first item loaded at .699 for "Intellectual Self-confidence," with other items loading successively lower, down to .352 for "Cooperativeness." The second factor loaded "Academic ability" at .629, and all other selfefficacy ratings below .102. It is customary to only consider loadings of .3 or larger (Harrington, 2009). With "Academic ability" nearly standing alone as a separate factor, it was eliminated in the next round of exploratory factor analysis. A second round of factor analysis was conducted on "Intellectual self-confidence," "Social self-confidence," "Drive to achieve," "Mental health," and "Cooperativeness" (Table 3.4), which explained 44.77% of cumulative variance. In order of influence, "Social selfconfidence" was the most influential variable, followed by "Intellectual self-confidence," "Emotional health," "Drive to achieve," and finally "Cooperativeness". All factors met minimum loadings of .3.

Construct validity and reliability were tested using Cronbach's Alpha, which yielded a combined score of .691. Construct validity is established by measuring attributes that are not operationally defined (Harrington, 2009) but constructed as latent variables. While each of the five items contributed positively to the factor Alpha, their total was too low to be considered internally reliable. An Alpha of .70 or higher is considered acceptable (Institute for Digital Research and Education, 2016).

A third round of exploratory factor analysis on the pre-test variables may be seen in Table 3.5, again with loadings being too low. This analysis indicated that these five self-efficacy measures could not reliably be considered expressions of the same construct for incoming freshmen, but they should be studied separately.

**Post-freshman year.** The same analysis was then conducted on the post-test data set (Table 3.6). The results paralleled the pre-test results in a few ways and differed in one important way. Again in the first round, a second factor was seen, with "Academic ability" having an extreme loading of -.619, opposite "Social self-confidence" at .437.

Again, "Academic ability" was eliminated in the second round of factor analysis (Table 3.7). One factor emerged including "Social self-confidence," followed by "Intellectual self-confidence," "Emotional health," "Drive to achieve," and "Cooperativeness" with factor

loadings from .704 down to .392 respectively. The Alpha was calculated at .712, just *over* the minimum score considered reliable. This contrasted with the pre-test data, which had shown an Alpha just *under* the minimum to be considered reliable. Table 3.8 shows the contribution of each indicator to the total Alpha, showing "Cooperativeness" to have been the crucial item.

One additional test of reliability was conducted. The successful factor analysis was conducted again on a randomly selected sample of 90% of the population, as well as the remaining 10%. These revealed nearly identical findings, supporting the reliability of this student self-efficacy construct. This validated that student self-efficacy included several layers of self-confidence along with emotional health, drive to achieve and cooperativeness, that work together in students who successfully completed their freshman year.

### **Discussion of Findings**

Self-efficacy showed up differently from the beginning of the freshman year when it was fragmented or multi-faceted, to the end, when items factored together possibly serving as a synergistic force. Scores measuring most self-efficacy variables went down very slightly from the beginning to the end of the freshman year, with one exception- cooperativeness which increased slightly. The relationships between social, intellectual, and academic self-confidence, as well as emotional health, cooperativeness and drive to achieve were useful measures in understanding successful freshmen.

There is a difference between academic self-efficacy and intellectual self-efficacy. These attributes overlapped with unimpressive factor loadings, and with a reliability Alpha so low, that they must be considered separate factors. This merits looking at what we mean by intelligence and its relationship to academic self-efficacy. The word "intelligence" has three different uses, (a) a property of being human, (b) a dimension on which human beings differ, and (c) the way

people carry out tasks in light of their goals (Gardner, 2011). These meanings tie closely to the notion of self-efficacy as an attribute that influences success in many facets of life including school.

Academic self-efficacy distinguished itself as separate from intellectual self-confidence and has implications for instruction and for research. Dweck's (2007) growth mindset theory indicated that believing intelligence grows throughout a lifetime can apply to success in many forums of life, including school. This research suggests that good instructors can tap into students' intelligence beliefs to grow students' academic skills and perhaps secondarily, academic self-confidence.

Consistent with many scholar's work, "Intellectual self-confidence" and "Social selfconfidence" factored together with the highest loadings of any other self-efficacy measured. The connection between social and intellectual beliefs is in agreement with Bandura's SCT (1986), described earlier in this literature review. Also, Tinto's (2003, 2011) work on learning communities emphasized social and intellectual involvement to promote students' cognitive development. Belenky et al (1997) found women's intellectual self-concept to be intimately associated with their personal and social relationships.

College is an environment with social influences (Calhoun, 1996) which are as important to students' success as their own sense of personal interest and skill (Antony & Taylor, 2000; Bandura, 1996; DeBerard, Spielmans, & Julka, 2004). And the social influences on student selfefficacy have long roots in the problems of American higher education, as described in a history of community colleges, "...aspirations to move ahead are often accompanied by a belief in the legitimacy of inequalities that are based on genuine differences in ability and effort- and by doubts about whether one measures up" (Brint & Karabel, 1989, p. 7). To be effective, higher education must cultivate students' beliefs about their abilities in order to support their success.

The one area where five self-efficacy variables factored reliably together was in the posttest data from the end of the freshman year. It included "Cooperativeness," "Drive to achieve," Intellectual self-confidence," "Emotional health," and "Social self-confidence" (Table 3.7). "Cooperativeness" was the item that gave this factor the Alpha needed for reliability (Table 3.8). "Cooperativeness" was also the only self-efficacy measure that increased between the beginning and end of the freshman year, which calls for future study. Considering the predominant age of this student population, most were 18 or 19 years old, it is tempting to attribute a higher level of cooperativeness to normal growth and maturity in young adults (Erikson, 1950); however, a regression analysis showed the opposite. With 14,241 freshman survey responses, regression analysis was calculated with "Cooperativeness" as the dependent variable using the enter method. With a p value of .622, "Age" was not statistically significant and cannot explain the increase in "Cooperativeness."

These factors of self-efficacy should be studied in terms of the college environment, and could be attributed to many different influences in the college learning environment, including mentorship experiences (Bailey et al., 2015; Salisbury, Pascarella, Padgett, & Blaich, 2012; Schunk & Mullen, 2013). Tinto (2002, 2003) described how learning communities transform the experience of college freshmen and "address the deeper roots of retention. They challenge the prevailing discourse on campus by seeking to include faculty and staff across the campus in that discourse. In effect, student learning communities take student learning and retention seriously" (2002, p. 7). It would also be worth looking at campus practices that develop cooperativeness

and how they work synergistically with other self-efficacy attributes to be factors in the lives of college freshmen.

## **Implications for Practice**

Understanding the nature of self-efficacy can help academic professionals empower students' success. Knowing that self-efficacy is multi-faceted, particularly among entering freshman, should help academic professionals target their efforts. It is noteworthy that Intellectual self-confidence and Academic self-confidence are poor partners. The findings of this study suggest an opportunity for instructors to empower students who know themselves to be smart but do not know themselves to be good in school. This distinction would be especially important to convey to freshmen who are new to college expectations, and particularly so for freshmen who are enrolled in developmental education coursework.

Students who begin college in developmental education classes have more to overcome than their peers. In the study cited earlier on grades being predicted by developmental math students' beliefs, Zientek et al (2013) concluded that,

... Instructors need to address student self-efficacy beliefs in various aspects of academic engagement including (a) Self-Regulated Learning Strategies, (b) Resource Management Strategies, (c) Motivation Strategies, (d) Meeting Others' Expectations, (e) Cognitive Strategies, (f) Self-Assertiveness, and (g) Beliefs in intelligence. (Zientek et al., 2013, p. 1007)

In another study of Latino students, developmental courses were significantly related to delayed enrollment in transfer programs from community colleges (Crisp & Nora, 2010). A supportive environment during the freshman and sophomore years was especially impactful, with positive interactions between students and faculty having been major reasons contributing to persistence in school. Students need to be cultivated as lifelong learners. Today's workers will change jobs five or six times in their lives (O'Banion, 2010). Under these economic realities, no degree can be seen as terminal, and success means frequent retraining in professional and academic environments. This speaks to the need for developing broad resilience in both school and life. This study suggests that the ability to cooperate in the face of changing circumstances, such as those faced by college freshmen, has a special role in self-efficacy. It underscores the connectedness of students within the social systems of college even as they function in their own self-interest.

### **Limitations and Future Research**

While the changes in self-efficacy measures from the beginning to the end of the freshman year were highly statistically significant, the actual measured amount of change was very slight. This study was exploratory in nature. It is best to consider these findings to be primarily about what student self-efficacy is and not about student development. Further analysis of the data is warranted.

First, future studies should test the implicit assumption that diverse students experienced self-efficacy the same way. Second, "Cooperativeness" was the only measure that increased over the course of the freshman year. It was also the variable that contributed to the reliability of the five facets of self-efficacy that loaded as a reliable factor, "Cooperativeness," "Emotional health," "Intellectual self-confidence," "Social self-confidence," and "Drive to achieve." It would be helpful to continue to explore the nature of "Cooperativeness" as potentially having a special place in freshman self-efficacy as well as how it affects the freshman experience. Replication of these findings would be helpful (Kass, Caffo, Davidian, Yu, & Reid, 2016) to see if other freshman cohorts grow in "Cooperativeness" in the same way that this cohort grew.

Third, future studies should attempt to predict changes in student self-efficacy based on experiences on campus, such as developmental education, social activities, and other forms of engagement. Many studies indicated that student protégés experienced increased self-efficacy as a result of mentorship (Baxter-Magolda, 2008; Bullock-Yowell et al., 2014; Davis, 2008; Dutta et al., 2011; Erlich & Russ-Eft, 2011; Hurtado et al., 2010; Kober, 2015; Kram, 1983; Schunk & Mullen, 2013). Studying the connection between freshman self-efficacy and the development of mentoring relationships could inform the practices of student service professionals.

### Conclusions

The literature describes self-efficacy as an overarching attribute that broadly influences people's ability to overcome obstacles and achieve goals. In this study, six measures of students' self-efficacy were analyzed using exploratory factor analysis, "Academic ability," "Intellectual self-confidence," "Social self-confidence," "Cooperativeness," "Drive to achieve," and "Emotional health." Analysis of the pre-test data suggested that none of these attributes should be considered the same construct for incoming freshman, yet by the end of the freshman year, slight changes in some of the measures resulted in five of the six items loading strongly enough to be considered a reliable, latent self-efficacy factor in college freshmen.

All ratings of the individual variables of self-efficacy declined significantly over the course of the freshman year with one exception; "Cooperativeness" which significantly increased. The post-test data collected at the end of the freshman year factored five attributes together with adequate loadings and an acceptable reliability score (Alpha) to be considered a single student self-efficacy factor. This suggested that "Cooperativeness" may have a synergistic effect on other aspects of students' self-efficacy, namely "Emotional health," "Intellectual self-confidence," "Social self-confidence," and "Drive to achieve." The relationship among these

variables and how they changed over the course of the freshman year should be studied further and replicated if possible.

"Academic ability" factored separately from all other self-efficacies studied, including "Intellectual self-confidence." This is a reminder that intelligence is socially constructed (Howard, 1991) and that peers, instructors, mentors, and institutional influences may all affect students' self-perceptions. For academic professionals, this study is a reminder that students' self-efficacy grows in a multi-faceted way, and that not all measures of self-efficacy can be relied on to reveal how students are affected by their campus experience. This has ramifications for instructors, student services professionals, and researchers who care about cultivating student success.

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Туре	Frequency	Percent
Public	2558	16.1
Universities	2338	10.1
Private	2028	18.5
Universities	2920	10.5
Public 4yr	1201	76
Colleges	1201	7.0
Nonsectarian	4148	26.2
4yr Colleges	110	20.2
Catholic 4yr	2259	14.2
Colleges	223)	17.2
Other		
Religious 4yr	2658	16.8
Colleges		
Public 2yr	33	2
Colleges	55	.2
Private 2yr	70	4
Colleges	70	
Total	15855	100.0
Colleges Public 2yr Colleges Private 2yr Colleges Total	2658 33 70 15855	.2 .4 100.0

Number of students at each type of participating institution

Type of Self-	N Pre-	Pre-	N Post-	Post-	Std.	Change
efficacy	freshmen	freshman year average	freshmen	freshman year average	Deviation	in Average Self-
						efficacy
Drive to achieve	15,093	4.12	14,271	4.02	.785	10
Academic Ability	15,104	3.97	14,279	3.85	.702	12
Cooperativeness	15,080	3.87	14,267	3.94	.750	.07
Intellectual self- confidence	15,069	3.67	14,269	3.61	.871	06
Emotional health	15,079	3.56	14,272	3.48	.915	08
Social Self- confidence	15072	3.34	14,271	3.32	.958	02
Valid N listwise	14,950		14,190			

Average self-efficacy at the beginning and end of the freshman year (on a five point scale) Five of six show a decrease in self-efficacy, the only increase being in cooperativeness.

Table 3.2 was created from the raw data in the Appendix

Factor Intellectual Academic self-confidence self-confidence Self Rating\_TFS: Self-confidence (intellectual) .699 .036 Self Rating\_TFS: Self-confidence (social) -.408 .645 Self Rating\_TFS: Emotional health .525 -.238 Self Rating\_TFS: Drive to achieve .513 .102 Self Rating\_TFS: Cooperativeness .352 -.113 Self Rating\_TFS: Self-confidence (academic ability) .557 .629

Round	One:	Exp	loratory	factor	analysis	on	pre-test	measures
110 000000	0.110.	Loop		10000	0000000000	0.0	pre lest	11100001100

Extraction Method: Principal Axis Factoring.

a. Attempted to extract 2 factors. More than 25 iterations required. (Convergence=.005). Extraction was terminated.

b. Two factors emerged. All measures loaded moderately to strongly under Intellectual self-confidence except Academic self-confidence, which loaded essentially by itself.

	Factor
	Social Self-confidence
Self Rating_TFS: Self-confidence (social)	.692
Self Rating_TFS: Self-confidence (intellectual)	.644
Self Rating_TFS: Emotional health	.579
Self Rating_TFS: Drive to achieve	.470
Self Rating_TFS: Cooperativeness	.382

Round Two: Exploratory factor analysis on pre-test measures

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 7 iterations required.

b. In the next round of factor analysis, Academic self-confidence was eliminated. One factor emerged with Social self-confidence loading the most strongly. But at .691, the Alpha was lower than the desired standard of .7, so was not considered to be a reliable scale.

	Factors			
	Intellectual			
	self-confidence	Cooperativeness		
Self Rating_TFS: Self-confidence (intellectual)	.639	100		
Self Rating_TFS: Self-confidence (academic ability)	.612	392		
Self Rating_TFS: Drive to achieve	.575	.052		
Self Rating_TFS: Emotional health	.476	.316		
Self Rating_TFS: Cooperativeness	.374	.331		

Round Three: Exploratory factor analysis on pre-test measures

Extraction Method: Principal Axis Factoring.

a. Attempted to extract 2 factors. More than 25 iterations required. (Convergence=.003).

b. It was hard to imagine Academic Self-confidence and Intellectual Self-confidence belonging in separate factors, so round three was completed with Social self-confidence eliminated. It showed again two factors, with low loadings.

	Factors			
	Intellectual Academic Self-			
	Self-confidence	confidence		
Self Rating2: Self-confidence (intellectual)	.706	034		
Self Rating2: Self-confidence (social)	.657	.437		
Self Rating2: Emotional health	.579	.257		
Self Rating2: Drive to achieve	.529	122		
Self Rating2: Cooperativeness	.366	.086		
Self Rating2: Self-confidence (academic ability)	.612	619		

## Round One: Exploratory factor analysis on post-test measures

Extraction Method: Principal Axis Factoring.

a. Attempted to extract 2 factors. More than 25 iterations required. (Convergence=.005). b. Exploratory Factor Analysis was repeated on YFCY data to see if the items loaded differently with a new data set and experienced students. Again, Academic self-confidence factored separately from all other self-efficacy measures, and loaded almost opposite to Social selfconfidence, at -.619 and .437 respectively. Academic self-confidence was eliminated in the next round, shown in Table 3.7.

# Round Two: Post-test factor analysis

	Factor
	Freshman Self-efficacy
Self Rating2: Self-confidence (social)	.704
Self Rating2: Self-confidence (intellectual)	.650
Self Rating2: Emotional health	.640
Self Rating2: Drive to achieve	.478
Self Rating2: Cooperativeness	.392

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 7 iterations required.

b. The five measures of student self-efficacy loaded high enough to be considered a factor.

Cronbach's Alpha on this scale was .712, high enough to be considered a reliable scale.

		Scale	Corrected	Cronbach's	
	Scale Mean if	Variance if	Item-Total	Alpha if Item	
	Item Deleted	Item Deleted	Correlation	Deleted	
Self Rating2:	14 42	7 4 4 7	241	710	
Cooperativeness	14.43	/.44/	.341	.710	
Self Rating2:	14 80	5 067	524	641	
Emotional health	14.09	5.907	.524	.041	
Self Rating2: Self-					
confidence	14.75	6.279	.523	.642	
(intellectual)					
Self Rating2: Self-	15.05	5 855	552	627	
confidence (social)	15.05	5.055	.552	.027	
Self Rating2: Drive to	1/1 35	6 894	409	687	
achieve	14.55	0.094	.409	.007	

# Contribution of each item to the total Alpha

a. This table indicated how much each item contributed to the Alpha. The crucial element was Cooperativeness, the only attribute that increased from the beginning to the end of the freshman year.

# Appendix

# Pre- and Post-test Self-efficacy Descriptive Statistics

# Table 3.9

# Pre-test self-efficacy descriptive statistics

					Std.
	Ν	Minimum	Maximum	Mean	Deviation
Self Rating_TFS:	15104	1	F	2.07	702
Academic ability	15104	1	3	3.97	.702
Self Rating_TFS:	15000	1	5	2 07	750
Cooperativeness	15080	1	5	3.87	.750
Self Rating_TFS: Drive	15002	1	5	4 1 2	705
to achieve	13093	1	5	4.12	.765
Self Rating_TFS:	15070	1	5	256	015
Emotional health	13079	1	3	5.50	.915
Self Rating_TFS: Self-					
confidence	15069	1	5	3.67	.871
(intellectual)					
Self Rating_TFS: Self-	15072	1	5	2.24	059
confidence (social)	13072	1	3	5.54	.938
Valid N (listwise)	14950				

					Std.
	Ν	Minimum	Maximum	Mean	Deviation
Self Rating2:	1 4070	1	-	2.05	7(2)
Academic ability	14279	1	5	3.85	./63
Self Rating2:	14067	1	5	2.04	766
Cooperativeness	14207	1	5	5.94	./00
Self Rating2: Drive	14071	1	5	4.02	051
to achieve	14271	1	5	4.02	.0.34
Self Rating2:	14070	1	5	2 10	0.95
Emotional health	14272	1	5	5.40	.905
Self Rating2: Self-					
confidence	14269	1	5	3.61	.903
(intellectual)					
Self Rating2: Self-	14071	1	5	2 22	0.95
confidence (social)	142/1	1	5	3.32	.985
Valid N (listwise)	14190				

# Post-test self-efficacy descriptive statistics

Chapter 4 Manuscript III

Mentorship and Student Self-efficacy: Predicting Academic Self-confidence

Submitted by

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Prepared for submission to: Journal of College Student Development N491 Lindquist Center, The University of Iowa Iowa City, IA 52242
#### Abstract

Student self-efficacy is fundamental to student success. Mentorship from faculty, staff, advisors, and counselors can be effective at building students' academic selfconfidence. Bandura's Social Cognitive Theory served as a guiding framework for exploring the effect of mentorship on academic self-confidence in college freshmen. A nationwide survey of over 15,000 students provided self-report scores for academic selfconfidence before and after students' freshman year. Exploratory factor analysis was used to study students' mentorship-initiating behaviors and attitudes regarding faculty, staff, advisors, and counselors. Regression analysis was used to identify what mentorship experiences on campus predicted changes in students' academic self-confidence. Results showed that some, but not all, contact with potential mentors predicted positive changes in academic self-confidence. Attending office hours, as well as faculty showing concern for students' progress, may predict reductions in academic self-confidence. Implications for educators include understanding the nature of interactions that help develop students' academic self-confidence, with promise for supporting student success.

*Keywords:* Social Cognitive Theory, self-efficacy, student self-confidence, academic self-confidence, mentorship, student success, mentor relationship development theory, office hours

Mentorship as a Predictor for Freshmen Academic Self-efficacy

According to the American Association of Community Colleges (2012), the United States has been under-producing graduates since at least 1980, contributing to income inequality and a decline of the middle class. Yet in spite of the urgent need for degrees, certificates, and credentials, student success rates are unacceptably low, employment preparation is inadequate, and disconnects in transition between high schools, colleges, and the workforce continue to be a problem (Bailey, Jaggars, & Jenkins, 2015). One way to bridge these disconnects and empower students to engage in and complete degree programs is through mentorship (Truesdell, 1996; Zelek, Salaman, Qing, & Keller, 2013).

One in three young people will grow up without a mentor, and for this reason are at risk of falling off track with attendance or behavioral problems (Garringer, Kupersmidt, Stelter, & Tai, 2015). Mentoring benefits productivity, career commitment, and self-efficacy (Paglis, Green, & Bauert, 2006). Psychosocial mentoring supports a sense of competence, confidence, and effectiveness in the protégé's life. It develops resilience and perseverance. Mentored young adults are 55% more likely to enroll in college and 130% more likely to hold leadership positions (Garringer et al., 2015). With these benefits, colleges would do well to examine how their interactions with students can function more like mentorship.

Mentoring is defined as "interactions between more-experienced mentors and lessexperienced protégés, where mentors provide career and psychosocial knowledge, advice, and support" (Schunk & Mullen, 2013, p. 362). The present study examined college freshmen to find a relationship between freshman mentorship experiences and changes in their academic self-efficacy. Self-efficacy is the belief is one's ability to organize action to complete a goal (Bandura, 1977a). Among other things, self-efficacy develops from encouragement and role modeling, such as that provided by a mentor, as well as mastery experiences, such as the risks taken and experiences gained due to the guidance of a mentor.

This study of college freshmen is inspired by the urgent need of first year students to make a significant connection as early as possible (Arnsparger & McClenney, 2012; O'Banion, 2013). "When students were asked to identify the single most important thing that keeps them coming back to their college, they consistently answered that a faculty member, counselor, advisor, student, or another person at the college 'knows my name'" (p. 18). Mentorship is an area of student success with underdeveloped research (Crisp & Cruz, 2009), and more needs to be discovered about connecting mentoring with positive outcomes (Schunk & Mullen, 2013).

## **Literature Review**

This literature review developed the definition of mentorship, mentoring relationships, and benefits of student mentorship. Second, the use of frequency and satisfaction with mentorship interactions were examined as measures of developing mentoring relationships. Finally, gaps in the literature were identified.

#### Mentorship

Academic mentoring is defined as the involvement of higher education faculty, advisors, or supervisors in learning relationships that are focused on the career and personal development of students, graduates, or junior faculty (Fletcher & Mullen, 2012). Mentoring is "a complex intellectual, social and emotional construct with the capacity for professional support, learning and professional knowledge generation" (p. 109).

Mentoring takes place within a context of broader societal norms and values (Fletcher & Mullen, 2012). The risks of poverty, limited networks, and schools with low resources are

compounded by the fact that one third of young people in the United States have no mentors (Bruce & Bridgeland, 2014), and the rates are even higher for at-risk youths. In Bruce and Bridgeland's meta-analysis of 73 mentoring programs, positive outcomes of mentorship included development of protégé's social, emotional, behavioral, and academic competence. They credited quality mentoring as a way for the United States to again become first in the world for college completion.

Expectations for faculty mentoring of students have shifted over time. At the earliest colleges in the United States, faculty taught, tutored, mentored, and lived with students (Gordon, Habley, & Grites, 2009). When faculty began to feel pressure to spend more time on research, student needs were transferred to human resources specialists, and faculty became more distant, were less approachable, and embodied authority. Early academic advisors were expected to mentor students by listening as they processed their difficulties, acting as their representative, and seeing to it that their courses of studies were well planned. More recently, advisor mentoring has been credited for increased productivity and self-efficacy in graduate students (Paglis et al., 2006), as well as career self-efficacy in community college students (Erlich & Russ-Eft, 2013). Currently, faculty mentoring has a special place in student success, and faculty advising has been credited with increasing student satisfaction with college (McArthur, 2005).

Mentorship is a source of learning that models success and builds self-efficacy (Bandura, 1997; Paglis et al., 2006). Self-efficacy is defined as having a belief in one's ability to organize and execute actions necessary to achieve a goal (Bandura, 1997). In a prior manuscript, student self-efficacy was analyzed and found to have many facets, including emotional health, cooperativeness, intellectual self-confidence, social self-confidence, drive to achieve, and academic self-confidence (Williams & Russ-Eft, 2016). This study focuses on academic self-

confidence, an attribute particularly relevant to college freshmen, who are often struggling to adapt to the college environment (Bailey et al., 2015; Tinto, 2002).

# **Mentoring Relationships**

Student mentorship may take place from a variety of academic professionals including faculty (Eagen, Herrera, Garibay, Hurtado, & Chang, 2011), advisors, counselors (Bailey, Jaggars, & Jenkins, 2015; Erlich & Russ-Eft, 2013), and staff (Bailey et al., 2015). Some mentoring interactions have been shown to increase student self-efficacy in the first interaction (Erlich & Russ-Eft, 2013). Yet true mentoring relationships develop over time (Kram, 1983). According to Kram, the four stages of mentoring relationships include; (a) Initiation- this is characterized by inviting, supportive behavior and a positive fantasy of admiration and respect for the mentor, typically during the first six to 12 months of the relationship; (b) Cultivation- this is when most of the benefits of mentorship accrue and may include role modeling, acceptance, challenging work, coaching, exposure and visibility, protection, and sponsorship, typically lasting from two to five years; (c) Separation- this is a time of reduced closeness due to changes in organizational affiliation, or the feelings of one or both individuals; and (d) Redefinition- this is a time when a new form of relationship develops, such as peers or friends, or ending the relationship entirely. This study focuses on the initiation stage when mentored freshmen should be experiencing the positive fantasy of admiration and respect and feeling satisfaction with mentoring experiences on campus.

Mentoring can take place in an informal way, and it can be part of a formal program. Both formal and informal relationships have been found beneficial, with no significant differences in outcomes between them (Ragins & Cotton, 1999). These two different approaches will be described in the following paragraphs. **Informal mentoring.** Informal mentoring relationships are "...not managed, structured or formally recognized by the organization" (Chao, Walz, & Gardner, 1992, p. 620). Traditionally, mentorship occurred spontaneously between individuals. Both individuals selected each other voluntarily and were drawn by mutual liking, identification, and attraction (Allen, Eby, & Lentz, 2006). The relationship, in such cases, met both individuals' developmental needs. The mentor gained a sense of generativity (Erikson, 1950), purpose (Kram, 1983), and the satisfaction of watching a protégé grow. The protégé gained professional identity (Chao et al., 1992), personal competence (Allen et al., 2006), and the psychosocial benefits of having a senior role model who cares (Paglis et al., 2006).

**Formal mentoring.** Formal mentorship takes place through recognized programs, many of which were put in place for their value in career development and professional cultivation (Davis, 2008). One advantage of formal mentoring may be training in effective mentorship. Protégés have reported higher quality mentorship, career mentoring, and role modeling when training was part of the formal mentoring program (Allen et al., 2006). Hours spent in mentorship training were also positively related to psychosocial mentoring.

## **Benefits of Mentoring**

The benefits of mentorship to student success are well established (Anderson & Shannon, 1988; Paglis et al., 2006). Mentored undergraduate students earned higher GPAs, completed more units, and had a lower dropout rate than non-mentored peers (Campbell & Campbell, 1997). A sample of over 22,000 undergraduate students who had been mentored by an advisor had more knowledge of college requirements and were more likely to report having a significant relationship with faculty or staff (Smith & Allen, 2014). Advisor mentoring has been credited with increasing productivity and self-efficacy in graduate students (Paglis et.al. , 2006).

Mentoring has an impact on diversity, opportunity, and the college climate; the creation of student mentorship programs has been associated with inclusive and socially just campus environments (Wall & Obear, 2008). A study of students in TRIO, a federal program to benefit students from disadvantaged backgrounds (United States Department of Education Office of Postsecondary Education, 2016), indicated that successful students engaged in effective mentoring by (a) checking in with staff "to talk or hang out," (b) considering staff to have been "a tremendous support to them" by helping them focus on their career interests, (c) helping them on issues and solutions for financial aid, and (d) helping in creation of an Education Action Plan (EAP) (Davis, 2008, p. 91). Conversely, student attrition from STEM fields was linked to a lack of sufficient mentorship opportunities (Landefeld, 2009). Mentoring helps students focus on their goals and align actions to achieve them; in short, mentoring builds students' self-efficacy.

Because mentor relationships develop over time, the frequency of contact may represent growing satisfaction in the relationship. Kram's (1983) mentoring relationship development theory tells us that those encounters will be satisfying to both parties. For these reasons, frequency and satisfaction are being used in the present study as measures of potential mentorship.

#### Gap in the Literature

Mentoring is studied differently across disciplines, and there is a need to integrate our understanding for the sake of students (Ghosh, 2012). In the business world, mentoring was positively related to protégé's promotions and compensation (Fagenson, 1989; Lyness & Thompson, 2000; Scandura & Shriesheim, 1994; Whitely, Dougherty, & Dreher, 1991), career satisfaction (Riley & Wrench, 1985), and organizational commitment (Douglas & Schoorman, 1988). Mentor relationship development theory, which first suggested that mentoring relationships develop over time (Kram, 1983), originated in the workplace. One study that crossed work and school domains showed that working students who experienced mentorship in their jobs showed gains in leadership self-efficacy (Salisbury, Pascarella, Padgett, & Blaich, 2012).

Many authors have noted the growth of self-efficacy that develops over time through an ongoing series of satisfying mentoring interactions (Anderson & Shannon, 1988; Kram, 1983; Paglis et al., 2006); yet only a few have looked at frequency and satisfaction as fundamental measurements of students' experiences with potential mentors (Crisp & Cruz, 2009; Smith & Allen, 2014). Longitudinal research is needed to examine the role of time on formal and informal mentorship (Chao, Walz, & Gardner, 1992). It is easy to surmise that more frequent encounters and more satisfaction with those encounters should translate to increased self-efficacy as a natural benefit of mentorship. However, Sax, Bryant, and Harper (2005) found that frequency of encounters with faculty does not necessarily translate into beneficial outcomes. There is a need to clarify the effect of mentorship experiences on student's self-concept during their crucial freshmen year.

#### **Research Purpose and Hypotheses**

Using Bandura's social cognitive theory, we can see mentorship as a potential source of growth in student self-efficacy. To explore whether college freshmen were experiencing the benefits of mentorship, the hypotheses were:

- Null hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is not related to student self-efficacy.
- Alternative hypothesis 1: Greater contact with faculty, advisors, counselors, and staff during the first year of college is positively related to student self-efficacy.

- Null hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is not related to self-efficacy.
- Alternative hypothesis 2: Students who report higher satisfaction with mentorship opportunities during their first year of college also report increased self-efficacy.

## **Design and Methods**

This study focused on frequency and satisfaction with potential mentor interactions as fundamental measures of how students experience early academic mentorship on campus. Astin's Input-Environment-Output model (I-E-O) (Astin & Antonio, 2012) provided the methodological framework. I-E-O was chosen because the model controls for attributes of the incoming student in block 1 of regression analysis. This allows campus experiences to be better identified for their impact in block 2 of the regression analysis. Regression analysis reveals the impact of multiple variables on the outcome (Creswell, 2012), in this case, mentorship encounters on students' academic self-confidence.

## Surveys

Two sets of linked freshmen surveys from 2012 and 2013 were analyzed to identify changes in academic self-confidence from before and after the first year of college. The 2012-13 surveys were completed by 15,855 students from hundreds of two and four year institutions nationwide (Higher Education Research Institute, 2012). The two surveys, The Freshman Survey (TFS) and Your First College Year Survey (YFCY), are considered valid through the input of many experts, and are highly reliable (Pryor, DeAngelo, Blake, Hurtado, & Tran, 2011; Stolzenberg, 2015). YFCY included questions regarding self-efficacy, as well as various experiences with potential mentors. Students responded to questions about their interactions with academic professionals including faculty, advisors, counselors, and staff members. They also reported on their academic self-confidence (Higher Education Research Institute, 2012).

Students' responses when they entered as freshmen were linked by their student identification number to their answers at the end of their freshman year, making longitudinal study possible. TFS includes a wide range of incoming student characteristics, such as demographics, high school achievement and activities, values, attitudes, beliefs, and self-concept (Higher Education Research Institute, 2014a). The YFCY provided the follow-up questions that made pre- and post-test comparisons possible. Students had responded to questions about their academic self-confidence (Higher Education Research Institute, 2012), as well as their interactions with faculty, staff, advisors, and counselors.

## **Statistical Methods**

Descriptive statistics revealed the dependent variable data were skewed to the left. For freshmen responses to the question on Academic ability, the most common answer was 4 out of 5 possible. This raised concerns about a possible ceiling effect, and non-normality. A review of the literature indicated that educational data is historically often skewed to the left (Ho & Yu, 2015), as are social and behavioral science data sets (Yuan & Bentler, 2000). These issues were addressed through statistical tests.

First, all variables were measured for skewness and kurtoses. According to Kline (2011), variables with skewness greater than 3 and kurtosis greater than 10 suggest a problem. All variables used had skewness below .22 and kurtosis below 4.2. Second, because of the large number of variables, tests for multicollinearity were conducted. This was done by calculating linear regression of each independent variable on all the other independent variables. In all cases, the variance inflation factor (VIF) for multicollinearity was below 3. The threshold for

acceptability was below 5 (Menard, 2002). These tests indicated that the data were sufficiently normal for parametric analysis.

Frequency and satisfaction are common measures of the student experience, and they have been linked to improved student learning (Lundberg & Schreiner, 2004). Exploratory factor analysis was conducted to identify any relationship among the frequency and satisfaction measures of students' experiences with mentoring. Exploratory factor analysis is a method that identifies latent variables or underlying factors (Harrington, 2009). It accounts for variation, covariation, and correlations among the variables. It can reduce the number of variables, avoid multicollinearity, and increase the parsimony of the model (Harrington, 2009). No variables were combined as all were found to be sufficiently independent of one another (Appendix F, Appendix G).

Descriptive tests revealed that some missing data were not missing at random. Appendix B describes in detail the study of missing data. It was decided to run the regression model three ways, once with original values using listwise deletion, again with imputed values using mean substitution, and again with imputed values using Maximum Likelihood Imputation (MI). MI employs the Expectation-Maximization Algorithm to check other variables to impute an estimated value (Grace-Martin, 2016), then tests whether it is the value most likely based on all the other variables. If not it re-imputes another more likely value.

Next, hierarchical multiple regression (Mertler & Vannatta, 2013) was used to predict academic self-confidence based on the frequency and satisfaction of freshmen's mentorship experiences on campus. Astin's Input-Environment-Output (I-E-O) model (Astin & Antonio, 2012) used regression analysis to predict a dependent variable, in this case Academic selfconfidence, based on multiple independent variables regarding students' experience. Block regression controlled for the attributes of the incoming student, before attributing environmental influences of the college experience. SPSS software version 23 was used for regression calculations, and the p value was set at .05.

# **The Population**

The sample for study consisted of 15,855 freshmen attending a variety of institutions of higher education across the United States, including public and private four year colleges and universities, religious (not Catholic), Catholic, and nonsectarian four year colleges, as well as a few students from public and private two year colleges (Appendix F provides some information on the institutional type.) Additional population descriptors included socio-economic factors, ethnicity, and gender, described below.

**Socio-economic factors.** For a robust consideration of socio-economic factors affecting incoming freshmen, parents' education and income were analyzed (Appendix G). While "Mother's education" is predictive of youth's academic achievement (Altschul, 2012), and has been used as a proxy for socio-economic status (SES), the availability of additional relevant variables warranted exploration, including "Father's education" and "Parents' income." Ultimately, an additive variable including all three items was created for use in this study.

**Ethnicity**. Of the 15,855 freshmen studied, 15,410 provided information on their ethnic backgrounds, revealing an ethnic composition that was 65% White, 12.4% Asian, 10.7% mixed, 6% Hispanic, 4.5% Black, 1.3% Other, and .1% American Indian.

**Gender.** The population for this study identified as 64.1% Female and 35.9% Male. Forty-three respondents, or .3% of the sample, did not answer. This population has much larger representation from women than men. The ambiguous "Did not answer" population is too small for any meaningful analysis, and furthermore, the responses do not express whether the 43 individuals are intersex, other versions of gender ambiguity, or if they withheld their gender identity for other personal reasons. With growing concern for gender minorities in society, this author would have liked to study the mentorship experiences and self-efficacy of these populations too. But, given the small number, these 43 individuals were deleted from the sample.

#### Findings

This section summarizes the results of a three part analysis; (a) a paired samples T-test on academic self-confidence, (b) factor analysis on students' mentorship behaviors and attitudes, (c) regression analysis predicting academic self-confidence, followed by a discussion of findings and implications for practice.

## Academic Self-confidence

This population answered the question, "Rate yourself on academic ability as compared with the average person your age. We want the most accurate estimate of how you see yourself" (Higher Education Research Institute, 2012). Students answered on a five point scale with 1 being Lowest 10%, 2 = Below average, 3 = Average, 4 = Above average, and 5 = Highest 10%. A paired samples T test was then conducted on the pre and post-test measures of academic self-confidence (Appendix C) to discover whether the means of two variables were equal in a given population (IBM Inc., 2013). Table C.3 indicated the mean "Academic self-confidence" score between the beginning and the end of the freshman year reduced by -.123 from a mean of 3.98 to 3.85, and t(13,622) = -19.930, SD= .006, p < .001. Due to the direction of the t-value we can conclude a statistically significant reduction in post-freshman year "Academic self-confidence". This indicated that the freshman year was a challenging time for students' academic self-confidence.

### **Mentorship-seeking Behaviors**

The initiation stage of mentorship includes a first contact between the protégé and the mentor to see if there is an admiration or an attraction between them (Kram, 1983). If so, this feeling of satisfaction would likely lead to another interaction and more satisfaction. To find out if mentoring relationships were developing for freshmen, measures of frequency and satisfaction were analyzed.

Factor analysis was used in this study to discover if there were commonalities regarding (a) how often some students initiated contact with potential mentors, and (b) satisfaction among freshmen who had engaged with potential mentors. Factor analysis is used to find a model that optimizes parsimony and fits the data (Gredler & Schwartz, 1997). For thematic and statistical reasons, factor analysis was conducted on each category of questions separately, using Principal Axis Factoring and Promax rotation in SPSS. Promax was chosen because of its agility in correlating large datasets (IBM Inc., 2013).

**Frequency of mentorship interactions.** The variables representing frequency fell into three slightly different groups of questions (a) Frequency of seeking out potential mentors, (b) Frequency of interaction with potential mentors, and (c) Frequency of engaging with student services where potential mentors may be met. None of the variables loaded with high enough reliability to be considered the same factor (Appendix C).

**Satisfaction with potential mentorship interactions**. Questions pertaining to satisfaction fell into two groups, (a) Satisfaction that potential mentors are interested in me and empower me, and (b) Satisfaction with campus and student services where potential mentors may be found. Each group of variables represented different organizational levels of mentorship

opportunities, the former being interpersonal and the latter being organizational. The questions used different scales, and so were analyzed separately.

Unlike the frequency variables, Satisfaction that "potential mentors are interested in me" and "empower me" loaded as one factor (Appendix G). Behaviors involving faculty and staff loaded higher together, between .453 and .798, possibly indicating that students see faculty as also being part of the staff. Or, it could also mean students have more than one mentoring relationship with faculty and staff members. Because of the ambiguity of these possible interpretations, the author decided not to combine these variables for this study, and to run the regression analysis using all of the individual variables. This was the best way to connect actual mentorship experiences and attitudes with academic self-confidence.

## **Predicting Academic Self-confidence**

The next step of this study was to predict changes in Academic self-confidence based on mentorship experiences and attitudes. Linear regression is a means of analysis based on multiple correlation (Creswell, 2012). Its purpose is to predict scores on a single criterion variable using several predictor variables (University of Bedfordshire, 2016). The regression model included two blocks using listwise deletion of missing data, and the Enter method in SPSS 23. Enter was selected as the best way to interpret output on this exploratory set of variables. The following sections discuss the impact on students' academic self-confidence of (a) students' characteristics, (b) frequency of engagement with potential mentors, (c) satisfaction of engagement with potential mentors, and (c) institution types. Table 4.1 is a summarized interpretation of the regression findings, while Table 4.2 is the comprehensive model.

**Impact of students' incoming characteristics**. Table 4.1 lists in order of impact from the largest positive influence down to the largest negative influence on students' academic self-

confidence. The single largest predictor of students' academic self-confidence at the end of the freshman year was their academic self-confidence at the beginning of the freshman year. With a beta of .401, the bulk of academic self-confidence clearly developed before their arrival at college. The Beta weight indicated how many standard deviations of change in the dependent variable, in this case academic self-confidence, would result from a change of one standard deviation in the independent variable (University of Bedfordshire, 2016). The second most influential independent variable was high school grades with a beta of .127, down from .140 when they arrived at college. This is consistent with Bandura's Social Cognitive Theory (SCT) in that prior grades represent mastery experiences which are known to bolster self-efficacy (Bandura, 1977a; Zientek, Ozel, Fong, & Griffin, 2013). SES remained significant at about the same level of impact before and after the freshman year with betas of .087 and .086.

Two student characteristics predicted negative impacts on academic self-confidence, ethnicity and gender. Students who identified as Two-or-more races, Hispanic, and Asian experienced reduced Academic self-confidence with betas of -.020, -.037, and -.067 respectively. After other campus influences, the negative impact of ethnicity was reduced to -.010, -.027, and -.031, respectively. This speaks well of their college experiences having nurtured the selfefficacy of these students.

The third largest predictor was gender. Being female was negatively associated with Academic self-confidence with a Beta of -.091, and this figure was worse than when women arrived at college with a beta of only -.078. This does not speak well of women's experiences on campus and will be addressed in the discussion of findings and implications for practice below.

**Impact of frequency.** Some kinds of interaction were associated with increases in Academic self-confidence. Of those that were statistically significant, communicating regularly

with your professors had the highest beta at .034. Engaging with career services was second most impactful at .029, followed by interacting with faculty outside of class or office hours at .023, and asking a professor for advice after class at .022.

One additional variable became statistically significant as a result of MI, with an original p value of .054 and the imputed model of .028 (Appendix B). Interaction with academic advisors and counselors predicted a decrease in Academic self-efficacy of -.018. All other variables in the imputed dataset were interpreted the same as the original data because of having (a) met the required .05 p value, and (b) a Beta very close to that of the original data. The missing data analysis confirmed the validity of findings from the original data analysis.

Two more frequency measures predicted decreases in academic self-confidence, Engaging with student psychological services at -.021, and Interacting with faculty during office hours at -.026. These will be addressed further in the discussion of findings and implications for practice below.

**Impact of satisfaction**. As with frequency, some satisfaction measures predicted increases, and some predicted decreases in academic self-confidence. First, faculty believing in students' potential to succeed had a beta of .127, just as important as the influence of high school grades. Staff recognizing achievements was also important with a beta of .105, followed by satisfaction with the amount of contact with faculty at .073, and finally, having at least one faculty member who has taken an interest in students' development had a beta of .033.

Four satisfaction variables were negatively associated with Academic self-confidence including (a) Satisfaction with student psychological services at -.23, (b) Faculty showing concern about the students' progress with a beta of -.037, (c) Faculty encouraging the student to

meet with them outside of class with a beta of -.031, and (d) Staff encouraging the student to get involved in campus activities with a beta of -.057.

**Institution type.** Of the seven categories of institutions, three were statistically significant in their impact on students' academic self-confidence, all positively. After mentorship experiences, public four year colleges predicted improved Academic self-confidence scores with a beta of .033. Catholic four year colleges fared similarly with a beta of .028. And Public two year colleges also showed up well with a beta of .023. This was surprising in that this last institutional category had a sample of only 33 students (Appendix D), yet carried high statistical significance with a p value of .003.

#### **Discussion and Implications**

The following discussion begins by presenting the research hypotheses and describing the results. It turns to a discussion of the implications for practice, followed by limitations of the current study and suggestions for future research.

**Null hypothesis 1** proposed that the amount of contact with faculty, advisors, counselors, and staff during the first year of college is not related to student self-efficacy. This is false. Regression analysis showed that more of the right kind of contact with potential mentors, such as communicating regularly with professors, predicted a slight but significant increase in students' report of academic self-confidence. At the same time, other kinds of contact, such as faculty showing concern about students' progress, predicted slight reduction (Table 4.1).

Alternative hypothesis 1 theorized that greater contact with faculty, advisors, counselors, and staff during the first year of college is positively related to student self-efficacy. This is partially true and partially false. Many kinds of engagement with

potential mentors were positive, including more frequent contact with professors in and after class, as well as frequency of engaging with career services. Two types of frequency were negatively associated with academic self-confidence, (a) interacting with faculty during office hours, and (b) interacting with student psychological services.

**Null hypothesis 2** proposed that students' level of satisfaction with mentorship opportunities in their first year of college is not related to self-efficacy. This is false. Several satisfaction variables did predict slight but significant changes in academic self-confidence.

Alternative hypothesis 2 proposed that students who reported higher satisfaction with mentorship opportunities during their first year of college would also report higher academic self-confidence. This is mostly true. When students experienced engagement that was supportive, such as faculty believing in their potential, faculty taking an interest in them, and staff recognizing their achievements, it built students' self-confidence. But not all contact had a positive effect.

Students' confidence was sullied by attending office hours, and by faculty showing concern about their progress. When staff encouraged students to get involved in campus activities, it also predicted reduced academic self-confidence. This survey question was phrased very broadly, and it is not possible to know whether the activities being encouraged were relevant to the student at the time. True mentorship would suggest that only personally useful activities would have been encouraged. These findings suggest that if staff members are making such generic encouragement, it is not having a positive impact of mentorship.

## **Implications for Practice**

This study revealed some interesting patterns about mentorship on campus. The academic self-confidence of college freshmen was influenced by their interaction with faculty, staff, and counselors, all of whom have roles to play as potential mentors. These findings support Kram's (1983) mentor relationship development theory which suggests that protégés benefit from mentoring relationships that develop over time. Most benefits accrue after the first six to 12 months of the relationship. This window of time represents the last few months of a successful freshman year of college, a time that can set the stage for persisting toward degree completion (Halpin, 1990; Tinto, 1982). These findings have ramifications for instruction as well as institutional structure of colleges and universities. The quality of faculty-student interaction as mentorship and its impact on students are discussed below.

Access to faculty. This study showed that attending office hours predicted a decrease in students' academic self-confidence. While it may be that students come to office hours because they have problems, this finding should be troubling to instructors and professors who work hard to send students out feeling better than they arrived. This study does not imply office hours are not needed. It does warrant exploring how students' individual needs and questions could be addressed in class and immediately afterward. These are actions that predicted positive academic self-confidence in this study, and such a positive effect is supported by other literature (Antony & Taylor, 2000; Bailey, Jaggars, & Jenkins, 2015; Cox, McIntosh, Terenzini, Reason, & Quaye, 2010; Lee, 1990; Love & Guthrie, 1999; Lundberg & Schreiner, 2004).

When students' questions are addressed immediately their issues do not simmer (Bailey et al., 2015). Immediate help can be the difference between students feeling supported (Tinto,

2011) rather than ruminating over their fears and failures (Seligman, 1998) which amplifies them.

Many professors manage courses with more than 50 to 100 students, making it impossible to address every question during class. With 10 minutes of passing time, and another class-full of students entering for the next session, even willing professors are often rushed and not able to linger with concerned students. This is where class size matters, and professors' availability to their students counts. In this study, campus satisfaction with the amount of contact with faculty was positively associated with academic self-confidence with a beta of .073. Warm student-faculty contacts are a hallmark of colleges that successfully encourage undergraduates (Chickering & Reisser, 1993; Eagan, Herrera, Garibay, Hurtado, & Chang, 2011; Lundberg & Schreiner, 2004; McArthur, 2005; Strange & Banning, 2001; Tinto, 1987; Wallin, 2004), making this a finding consistent with much literature.

**Office hours**. When it was necessary to come to office hours, this study indicated students were experiencing reduced academic self-confidence with a beta of -.026. Also, faculty showing concern about students' progress had an additional depressing effect with a beta of -.037 (Table 4.1). Office hours may be far away both geographically (distance) (Strange & Banning, 2001), chronologically (time), and conceptually (I have to go to office hours, because I am in trouble). So office hours should be handled with particular respect for the need to cultivate students' academic self-confidence.

There are ways to make those encounters powerful learning opportunities (Knowles-Yanez, 2016). "Since the setting is more private and confident than any other framework at university, a learner-centered atmosphere has to be created through talk that fosters students' learning and helps them to become socialized in the academic community" (Limberg, 2007, p.

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190). Personal and reciprocal behaviors are consistent with good mentoring relationships (Allen, Eby, & Lenz, 2006; Crisp & Cruz 2009; Kram, 1983). Knowles-Yanez (2016) suggested that faculty members focus on one educational angle, such as critical thinking questions, writing weaknesses, study habits, or organizing class material. The encounter should be personalized by taking interest in any personal details or opinions the student might share. Office hours are a good time for students to practice appropriate interpersonal conversation with adults.

This is also a good time to engage in motivational interviewing (Miller & Rollnick, 2012). While motivational interviewing has its roots in addiction counseling, it is widely used by school counselors at all levels of education to help students connect to their own power and build self-efficacy. The basic process is to (a) engage with the client/student, (b) focus on their goals, (c) strengthen their drive for change by reflectively listening to their values and motivations, and (d) amplify their plans for how to implement the desired change.

Women. Kram (1983) indicated that the research data on women with regard to mentor relationship phases was limited and that more study was needed. In this study, gender was the largest predictor of negative changes in academic self-confidence. Not only was being female negatively associated at -.078, the problem was made worse by campus experiences to -.091. Unfortunately, it is consistent with some literature on how women experience learning institutions (e.g., Belenky,, Clinchy, Goldberger, & Tarule, 1997; Brint & Karabel, 1989; Cohen & Kisker, 2010; Gilligan, 1982; Kezar, 2000).

Colleges were originally structured to meet the needs of men (Brint & Karabel, 1989; Cohen & Kisker, 2010), and little has actually changed for students in the structures, hierarchies, and processes of higher education. Women experience knowledge differently from men and often struggle to see themselves as authorities (Belenky, Clinchy, Goldberger, & Tarule, 1997). Women make choices based on a different moral framework than men (Gilligan, 1982), and their relational style of reasoning and ethics is sometimes discounted as illogical. Women "enact, think about, and interpret leadership differently from men" (Kezar, 2000, p. 722), and tend to be more collectivist in their organizational priorities. Gender-based differences have been observed in the college environment regarding activities as diverse as political engagement, social activism, gender role attitudes, and physical and psychological well-being (Salter & Persaud, 2003).

These differences can put women at a disadvantage in institutions that still value masculine notions of logic, justice, and wisdom (Gilligan, 1982; Kohlberg, 1984; Perry, 1970; Salter & Persaud, 2003). These differences can suppress essential parts of women's identity (Belenky et al., 1997). In fact women who described themselves in masculine or androgynous terms actually gained more success in male-dominated fields (Scandura & Ragins, 1993). These differences can have an impact on women's self-confidence in the academic environment, a place known to trigger stress, anxiety, and depression in both men and women (DeBerard, Spielmans, & Julka, 2004; Hemwall & Trachte, 1999). And women who do experience depression may be more prone to ruminate about their shortcomings than men (Love & Guthrie, 1999; Seligman, 1998). Salter and Persaud (2003) studied the 'chilly classroom effect' on men and women and summarized it this way:

The fact that women now receive more college degrees than men does not necessarily mean the quality of their educational experiences has improved. For some women in this study, one has to wonder how much more they would have achieved if they were not afraid when attending class. (Salter & Persaud, 2003, p. 843)

A wealth of literature supports the need to educate the whole person (Hemwall & Trachte, 1999). Instructor clarity and organization increases women's confidence in non-traditional careers such as engineering (Sax et al., 2005). Humanizing the educational

environment can make the classroom culture safer for both thoughts and feelings, which can improve affective learning (Salter & Persaud, 2003). As discussed in the section on office hours, students are reluctant to attend them, so a more wholesome classroom climate could have a positive effect on academic self-efficacy.

Programs that support women make a difference in student success and retention. A study at three women's college indicated the college mission focusing on the education and development of women had a great impact on students' leadership development (Whitt, 1994). Many characteristics of feminine leadership framed these women's experiences, including egalitarian and horizontal structures, participatory governance, concern for individual circumstances, high expectations, and female leader role models. In a study where women outperformed men on grade point averages (DeBerard, Spielmans, & Julka, 2004), women were more likely to seek out help from the academic advising and counseling departments. Women who participated in a mentorship program for women found they experienced a reciprocal relationship that meant managing boundaries (Rennick, 2005), managing strong emotions, and experiencing relational support from other women. They concluded that mentoring is a responsibility that warrants training, staffing, and rewards.

**Minority students.** Kram's model (1983) called for more study on the unique attributes of cross-race mentorship. The United States is becoming more ethnically diverse (Phinney & Alipuria, 1996) with more than one fourth of Americans identifying as non-White (U.S. Census Bureau, 2010). The success of students of color is overpredicted by the SAT test (Steele, 1997). Students of color tend to engage in campus life at higher rates than their white peers (Center for Community College Student Engagement, 2014b), yet graduate at lower rates. Stereotype threat may depress their achievement (Steele, 1997), unless they have optimistic relationships with

teachers that affirm their belonging, are given challenging work that respects their potential, and have role models who have overcome stereotype threat.

The Hispanic population is increasing and surpasses that of Caucasian students at many community colleges (Zelek, Salaman, Qing, & Keller, 2013). Yet Hispanic students continue to be underrepresented in higher education (Storlie, Moreno, & Portman, 2014), and less than one fourth of Latino students at community colleges successfully transfer to 4 year institutions (Crisp & Nora, 2010). Challenges for their college success may include language barriers, limited finances, and lack of familiarity with the college process. Success can be strengthened through training parents to serve as completion coaches (Zelek, Salaman, Qing, & Keller, 2013), multicultural mentoring programs, constructive criticism in a context of 'wise-schooling' (Cole, 2008), constructive faculty interactions (Storlie, Moreno, & Portman, 2014) and other encouraging encounters with mentors and educators (Torres & Solberg, 2001).

According to Jones' (2009) autoethnographic narratives and focus groups, multiethnic students experienced added complexity in adjusting to college. Jones found that self-authorship for students who identified as having two or more ethnicities meant navigating tensions between privileged and oppressed identities. Yet Phinney and Alipuria's work (1996) which compared survey responses between American-born students indicated no significant difference in self esteem between multiethnic and monoethnic students. Phinney and Alipuria also found that multiethnic students had more positive attitudes toward other groups than their monoethnic peers.

Allen, Eby, and Lentz (2006) found that the ethnicity of mentors and/or protégés was not related to greater mentorship quality. Yet some students express a preference for mentors of their own ethnicity (Center for Community College Student Engagement, 2014b). Students benefit when they have a network of peers, instructors, advisors and mentors who make time for them and believe in them (Center for Community College Student Engagement, 2014). College programs that affirm students' identities may go a long way to diversifying the scientific workforce in the future (Hurtado, Newman, Tran, & Chang, 2010).

**Counselors and student psychological services.** There is a difference between mentorship and counseling. A mentor provides moral support, encouragement, inclusion, challenge, introductions, and more (Allen et al., 2006) which can all positively affect mental states. Mentors should also know how to express sincere interest toward a person in need and help the student choose to seek mental health services when appropriate (Howard, 2015; Lancaster, 2008). Yet there is a boundary between mentorship and counseling that warrants professional training (Cook, 2009). While counselors are certainly potential mentors, they also address more complex issues in their student clients, which may include mental illness. Even students with high self-efficacy experience stress, which is directly associated with mental and physical health (Torres & Solberg, 2001). "People's beliefs in their coping capabilities play a pivotal role in their self-regulation of emotional states. This affects the quality of their emotional life and their vulnerability to stress and depression" (Bandura, 2012, p. 13). Screening interviews with students at counseling centers have increased by 65% from 2009 to 2014 (Wilson, 2015). And supporting the mental health needs of students is a growing responsibility of good colleges and universities (Council for the Advancement of Standards in Higher Education, 2006; Oregon Department of Education, 2008; Rothstein, 2014).

## Limitations

This study focused on the impact of mentorship experiences and attitudes on academic self-confidence in college freshmen. There are a few limitations that should influence how these results are interpreted. First, this was a very large dataset. The possibility of it being

overpowered should be considered, as most of the betas on the effect of campus mentorship were quite small. Second, the survey itself was not constructed with mentor relationship development theory in mind. Many variables relevant to this theoretical approach were not scaled to function together, which limited some analytical techniques that could have strengthened these findings.

These findings regarding the type of institution could warrant closer study. If there were also underlying differences between individual institutions, this analysis of type could have masked important differences between institutions of the same kind. Also, this dataset did not include any women's institutions, a category of colleges that may produce better results for women's academic self-confidence.

# **Recommendations for Future Research**

This study suggests a number of future research projects. First, if individual institutions were identified, it would provide more certainty regarding how the type of institution influences academic self-confidence. One example would involve a comparison of women's colleges, for example, with institutions having similar characteristics except for being coeducational. Specifically, do the declines in women's self-efficacy emerge for women at both types of institutions? Second, it would be helpful to look at the impact of mentorship experiences on other aspects of student self-efficacy including intellectual self-confidence, social self-confidence, cooperativeness, emotional health, and drive to achieve. Third, frequency and satisfaction likely work together in terms of how students experience mentorship on campus. Future studies could include re-coding the variables to explore factor analysis of these variables together. Fourth, exploratory factor analysis suggested there may be overlap in how students described their experiences with faculty and staff. Further exploration of these roles could help us understand how students experience faculty and staff as potential mentors. Fifth, it is interesting that several satisfaction variables factored together with high reliability, yet some of

them had positive and some had negative effects on academic self-confidence. Specifically, Table G.3 lists Satisfaction variables that factored together reliably at the end of the freshman year. It includes: (a) Having a faculty member take an interest, (b) Faculty believing in the students' potential, and (c) Faculty empowering the student to learn, all of which were positively associated with Academic self-confidence. Yet it also includes: (d) Faculty encourage the student to meet with them outside of class, and (e) Staff encourage the student to get involved in campus activities, both of which had negative associations with Academic self-confidence. This calls for further exploration of mentor roles and student attitudes as they shape student selfconfidence. Sixth, students' interaction with faculty continues to be complicated. Further study is needed to discover more about what faculty behaviors are problems for students, and what faculty behaviors rise to the status of mentorship. Seventh, this study showed that women and some ethnicities struggle regarding academic self-efficacy. Future studies should continue to examine how men, women and people of color experience college differently, to help increase rates of success across diverse populations.

Finally, this study should be replicated with different cohorts for several reasons. First, much literature shows that academic advisors have an important role as mentors; yet, this study only revealed their impact with the use of imputation of missing data. Replication would hopefully clarify their role through direct measures. Second, replication could reveal whether prior or subsequent cohorts had the same reaction to mentoring behaviors, and/or the same reduction in academic self-confidence during the freshman year.

This study revealed some interesting findings regarding faculty and staff. The group of variables on satisfaction that potential mentors are interested and empower students were factored two ways, once with faculty and staff together and again with faculty and staff separate.

The loadings and alphas were higher when the faculty and staff variables were calculated together. This speaks to the possibility that students were answering about faculty interchangeably with staff. Or, it could also mean students have multiple mentoring relationships with faculty and staff members. Because of the ambiguity of these possible interpretations, it would be appropriate to study this further with a closer eye to the differing and overlapping roles of faculty and staff as mentors.

## Conclusion

The single largest influence on students' academic self-confidence during the freshman year is their experience before arriving at college. Once students arrive, their engagement with potential mentors- including faculty, career services, advisors, and several types of counselors, can predict changes in how they feel about their academic ability. The single most positive mentoring influence on campus was having faculty believe in their ability to succeed academically. Communicating regularly with professors, asking their advice after class, and interacting with them outside of formal class or office hours boosted academic self-confidence. Yet not all contact with faculty had positive impact on students' academic self-confidence. Faculty need to be careful about, (a) how they show concern about students' progress, and (b) how they address students' needs without them having to come to office hours, both of which had depressing effects on academic self-confidence. Finally, the importance of support for the psychological needs of students, particularly women, is reinforced by this study. Mentorship on campus continues to be a powerful influence on student success and an area worthy of future research.

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Table 4.1

Impact of Mentorship Experiences on Students' Academic Self-confidence (using Betas)

impuci oj i	nemorship Experience	es on Stadents Meddentie Seij confidence (a	ising Delas)	
Beta			Satisfaction with Campus	
Change	Student Characteristics	Frequency of Campus Mentorship Experiences	Mentorship Experiences	Institution Type
Positive Impact				
	Incoming Academic Self-confidence .401			
	Average High School Grades .127		Faculty Believe in Students' Potential to Succeed .127 Staff Recognize Students' Achievements .105	
	Socio-Economic Status (SES) .086			
			At Least one Faculty Member has Taken	Public 4 Year Colleges
		Communicate Regularly with Professors .034 Career Services .029	an Interest in Student's Development .033	.033 Catholic 4 Yr Colleges .028
		Interact with faculty outside of class or office hours .023		Public 2 Year Colleges .023
Negative		Asking Professors Advice After Class .022		
<u>Impact</u>				
	Two-or-More			
	Races/Ethnicities01	Academic Advising018 (MI) Psychological Services021		
	Hispanic027	Seeing Faculty During Office Hours026	Satisfaction with Student Psychological Services23 Faculty Showed Concern about Student's Progress037	
			Staff Encouraging the Student to get	
	Asian031		Involved in Campus Activities057	
-0.1	Gender/Female091			

# Table 4.2

## Original Data Coefficients<sup>a</sup>

		Unstandardized Coefficients		Standardized Coefficients			
Model		В	Std. Error	Beta	t	Sig.	
1	(Constant)	1.370	.054		25.172	.000	
	Self Rating_TFS: Academic ability	.469	.010	.435	47.224	.000	
	What was your average grade in high	.092	.006	.140	15.162	.000	
	school?						
	Sex	123	.013	078	-9.387	.000	
	SES=Income+Fathers	.011	.001	.087	9.837	.000	
	education+Mothers education_TFS						
	Asian	149	.019	067	-7.873	.000	
	Hispanic	122	.029	037	-4.235	.000	
	Two-or-more race/ethnicities	050	.021	020	-2.427	.015	
	American Indian	.085	.210	.003	.404	.686	
	Other	.018	.059	.003	.307	.759	
	Black	.006	.034	.001	.176	.860	
2	(Constant)	.630	.069		9.160	.000	
	Self Rating_TFS: Academic ability	.433	.010	.401	44.787	.000	
	What was your average grade in high	.083	.006	.127	14.125	.000	
	school?						
	Sex	143	.013	091	-11.219	.000	
	SES=Income+Fathers	.011	.001	.086	9.969	.000	
	education+Mothers education_TFS						
	Asian	069	.019	031	-3.609	.000	
	Hispanic	090	.028	027	-3.226	.001	
	Two-or-more race/ethnicities	025	.020	010	-1.251	.211	
	American Indian	.006	.202	.000	.029	.977	
	Other	.023	.056	.003	.400	.689	
	Black	.016	.033	.004	.490	.624	

Public A vr Collagos	104	028	033	3 671	000
Cathelia Arr Calles as	.104	.028	.035	3.0/1	.000
Catholic 4 yr Colleges	.059	.021	.028	2.846	.004
Public 2 yr Colleges	.392	.134	.023	2.926	.003
Public Universities	.028	.023	.013	1.193	.233
Private Universities	.020	.020	.010	.977	.328
Nonsectarian 4 yr Colleges	.000	.018	.000	022	.982
Private 2 yr Colleges	021	.081	002	252	.801
Interact: Faculty during office hours	017	.006	026	-2.722	.006
Interact: Faculty outside of class or office hours	.014	.006	.023	2.459	.014
Interact: Academic advisors/counselors	015	.008	018	-1.928	.054
Interact: Graduate students/teaching assistants	.001	.004	.002	.220	.826
Sought personal counseling	006	.009	006	687	.492
Services: Student psychological services	030	.015	021	-2.026	.043
Services: Career services	.038	.011	.029	3.503	.000
Services: Academic advising	.004	.012	.003	.370	.711
Act: Been a guest in a professor's	.008	.014	.005	.578	.563
home					
Act: Asked a professor for advice after class	.027	.011	.022	2.352	.019
Act in College: Communicated regularly with your professors (recoded)	.027	.008	.034	3.647	.000
Act in Class: Received from your professor advice or guidance about your educational program	.011	.011	.010	1.035	.301
Satisfaction: Student psychological services	009	.004	023	-2.510	.012
Satisfaction: Academic advising	005	.006	008	938	.348

Opinion: Faculty showed concern about my progress	035	.008	037	-4.278	.000
Opinion: Faculty empower me to learn here	.012	.013	.010	.951	.341
Opinion: At least one staff member has taken an interest in my development	019	.013	018	-1.408	.159
Opinion: Faculty believe in my potential to succeed academically	.155	.015	.127	10.660	.000
Opinion: Staff encouraged me to get involved in campus activities	058	.010	056	-5.939	.000
Opinion: Staff recognize my achievements	.120	.012	.105	10.012	.000
Opinion: Faculty encouraged me to meet with them outside of class	035	.011	031	-3.314	.001
Opinion: At least one faculty member has taken an interest in my development	.036	.014	.033	2.506	.012
Campus Satisfaction: Amount of contact with faculty	.065	.009	.073	7.164	.000

Dependent Variable: Self Rating2: Academic ability<sub>a</sub>

### Chapter 5

## **General Conclusion**

The purpose of this dissertation was to develop the body of knowledge about mentor relational development theory (Kram, 1983) as it applied to the experiences of college freshmen. Chapter 1 proposed to study mentorship around roles, time spent together, and the benefits of the mentor/protégé relationship. Specifically, this study looked for correlations between students' mentorship experiences and changes in self-efficacy (Bandura, 1997) over the course of the first year of college. Pre- and post- freshman year surveys administered annually at colleges nationwide by the UCLA Higher Education Research Institute (2012) provided the opportunity for longitudinal study.

Manuscript I reviewed the current literature on mentoring students. It defined mentorship and its benefits, and showed that the responsibility to mentor students had changed over time. Mentorship may be formal or informal, and performed by faculty, advisors, counselors, or staff. Social Cognitive Theory (Bandura 1986, 1997) revealed the process by which mentoring influences self-efficacy, and the review suggested how these concepts have been measured.

Manuscript II explored the concept of student self-efficacy. This post-positivist study identified a nationwide sample of college freshmen attending a variety of two and four year colleges. Six types of self efficacy were measured before and after the freshman year, indicating a slight decrease in Academic self confidence, Social self-confidence, Intellectual selfconfidence, Emotional health, and Drive to achieve. Exploratory factor analysis was conducted on pre-test data revealing that some of the self-efficacy factors overlapped, but they did not have sufficient reliability due to low Cronbach's alpha scores to be considered the same factor. However at the end of the freshman year, Cooperativeness had slightly increased, apparently causing five factors to load powerfully and reliably together as a latent student self-efficacy factor. This indicated the possibility that growing cooperativeness had a synergistic effect over the course of the freshmen year on students' intellectual self-confidence, social self-confidence, emotional health, and drive to achieve.

Manuscript III proposed two hypotheses and described methods to test them. The same nationwide sample was used, which included information about the students themselves, allowing the opportunity to control for incoming attributes through block regression analysis. This is known as Astin's I-E-O model (Astin & Antonio, 2012) and is a standard for educational assessment.

Issues of reliability and validity were addressed, as well as the limitations of the study. The manuscript described in detail the regression analysis of students' incoming attributes and on-campus mentorship experiences for their influence on academic self-confidence. Results indicated that the single largest influence on students' academic self-confidence at the end of the freshman year was their academic self-confidence at the beginning. The second largest influence was high school grades. This was consistent with social cognitive theory in that high school grades represent prior mastery experience, a strong influence on self-efficacy (Bandura, 1997).

Regarding mentorship experiences, faculty believing in students' ability to succeed was the most important positive influence, equal in impact to high school grades. Communicating regularly with professors, asking their advice after class, and interacting with them outside of formal class or office hours boosted academic self-confidence slightly. Career counseling also had a small positive impact.

Not all influences reflected positive effects. Being female predicted reduced academic self-efficacy, and female self-efficacy was made worse by on-campus mentorship experiences.

This finding was consistent with other literature regarding how women experience colleges. In their histories of higher education in America, Brint and Karabel (1989), as well as Cohen and Kisker (2010) described learning environments created by men for men. Since women began attending college, little had changed in the structures and processes of higher education. The findings in this study, though measured amounts were small, support a preponderance of evidence that women who succeed in college are doing so in spite of environmental conditions that work against their constitutions, priorities, and learning styles (Belenky, Clinchy, Goldberger, & Tarule, 1997; Gilligan, 1982; Kezar, 2000; Salter & Persaud, 2003).

Students who identified as Two-or-more races, Asian, or Hispanic were also more likely to have lower self-efficacy, however their academic self-efficacy was improved slightly by oncampus mentoring experiences. This is consistent with Crisp and Nora (2010) in finding that positive interactions between students and faculty contributed to persistence decisions of fouryear Hispanic students. Lundberg and Schreiner (2004) found that the quality of faculty relationships was the strongest factor predicting learning among Asian/Pacific Islanders and Mexican-American students, and the second largest predictor of learning for multiethnic students. Cole (2008) found that faculty use of constructive criticism and other principles of 'wise-schooling' enhanced minority students' academic success and educational satisfaction.

## Limitations

There were several limitations to this study. First, this database was very large, and the possibility of it being overpowered should be considered, as most of the betas representing the effect of mentorship experiences on students' academic self-confidence were very small. Second, the survey questions were not designed specifically to study Kram's (1983) mentor relationship development theory, so variables relevant to this theory were not all scaled to

function together, which limited some analysis that could have revealed more about this topic. This dataset included institution type but not the institutions themselves, which could have masked differences within institution types. Also, there were no women's colleges included, which could have provided insight into the mentorship of college women.

#### **Implications and Recommendations**

This study validated Bandura's Social Cognitive Theory (Bandura, 1986, 1997) as it applies to mentorship of college freshmen. The most significant mentorship experience on freshmen academic self-confidence was faculty believing in their ability to succeed. This represents the reduction of affective barriers addressed in SCT as a powerful source of learning. Furthermore, faculty believing in freshmen ability to succeed was just as impactful as students' own high school grades, which were a measure of SCT's mastery experiences. Faculty would serve freshmen well by sincerely communicating their confidence in students' ability to succeed.

This study should not be considered conclusive regarding the application of Kram's (1983) mentor relationship development theory to college freshmen. Kram stated that the initiation stage could last from six to 12 months, after which most of the benefits of mentorship accrue during the cultivation stage. The meager benefits identified in this study do not indicate conclusively that powerful mentorship effects are taking place for freshmen, merely that some benefits from some contact with potential mentors are apparent. This does not judge whether mentoring relationships are developing deeply enough or fast enough to influence retention outcomes. This study supports much literature that called for colleges to find ways to connect powerfully to incoming freshmen. Future research could compare the outcomes at colleges with formal and informal mentorship programs to see if either version develops meaningful relationships sooner for incoming freshmen. Finally, the mentorship experiences measured were

limited, and other measures of mentorship experiences could be more revealing. For this reason, it could be helpful to return to qualitative research to explore in a more open-ended way where, how, and if freshmen are getting the mentorship they deserve during their crucial first year of college.

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APPENDICES

## Appendix A

## Methods: Mentorship and Student Self-efficacy

Empowering students to engage and complete a degree program is essential to successful college experiences, yet how college mentors can most effectively cultivate student self-efficacy has not been determined. This study examines the connection between opportunities for mentorship experiences and the development of student self-efficacy. It proposes to study mentorship in terms of three factors, (a) mentorship roles played, (b) time invested in the relationship, and (c) benefits of mentorship.

Self-efficacy is one of the potential benefits of mentorship, and is also one of the engines that drives academic success. Defined as having a belief in one's ability to organize and execute action necessary to achieve a goal (Bandura, 1997), expectations of eventual success affects students' coping, how much effort they will expend, and how long they will persist in the face of obstacles (Bandura, 1977b). Self-concept and self-esteem filter every interaction and frame how one approaches, responds to and interprets people's messages (Beebe, Beebe, & Redmond, 2005). This influences the ability to cooperate and work collaboratively, skills necessary to optimize group learning activities in the classroom (Kober, 2015). The stronger the expectations of mastery are, the more active are the efforts to achieve.

Mentorship is defined as the willing interaction between more-experienced mentors and less-experienced protégés, where mentors provide career and psychosocial knowledge, advice, and support (Schunk & Mullen, 2013). This study embraces the concept of mentorship as a process that cultivates the success of its protégés through a dyadic relationship that provides selfefficacy information. Mentors provide psychosocial support that reduces affective barriers, persuades students to try challenging things, and models success. As students take on more challenging tasks, those successes add to their confidence and abilities. For the purpose of this study, mentorship is defined as the willing interaction "between more-experienced mentors and less-experienced protégés, where mentors provide career and psychosocial knowledge, advice, and support" (Schunk & Mullen, 2013, p. 362).

These mentor-student interactions influence students' success in college and in life (Allen, Eby, & Lentz, 2006; Luitow, 2013; Schunk & Mullen, 2013). There are various academic professionals who may become mentors to students during their college experience. This study will look at potential mentors being faculty (Sax, Bryant, & Harper, 2005), advisors (Erlich, 2011; Smith & Allen, 2014), counselors (Clauss-Ehlers & Wibrowski, 2007) and staff members (Karp, 2011). Potential mentorship opportunities with faculty would be evidenced by the following types of actions: (a) interaction outside of class or office hours, (b) being a guest in a professor's home, and (c) being provided educational guidance; (d) when students feel more successful at getting to know faculty, (e) students find faculty easy to get to know, and (f) students feel satisfied with the amount of contact with faculty, then the possibility that these interactions constitute mentorship may be higher. Students who invest more time with professors are engaging in behaviors more likely to be consistent with mentoring relationships.

Mentorship experiences with counselors, advisors and staff professionals are reflected through similar opportunities such as (a) frequency of utilizing academic and career services, (b) frequency of interaction with academic advisors and counselors, (c) satisfaction with academic advising and career services, and (d) the belief that at least one staff member has taken an interest in the student's development. These behaviors are consistent with developing mentoring relationships.

## **Significance and Hypotheses**

The purpose of this study is to look for correlations and predictors between students' opportunities for mentorship with academic professionals and changes in self-efficacy as reported by students in their first year of college via pre- and post- tests administered annually by the UCLA Higher Education Research Institute (HERI) (2014c). This topic is significant in that college completion continues to be a challenge. Many students are not getting the guidance and support they need to complete their degrees (Booth & Bahr, 2013; Davis, 2008). Their opportunities for mentorship, as well as their personal inclination to seek it out vary greatly, and mentorship is most effective when mentor and mentee have some choice in the matter (Allen et al., 2006). A strong model for studying academic mentorship could inform which mentorship experiences have the greatest influence on student self-efficacy and how faculty and student services can better meet students' needs. The research hypotheses are:

- Null hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is not related to student self-efficacy.
- Alternative hypothesis 1: The amount of contact with faculty, advisors, counselors, and staff during the first year of college is related to student self-efficacy.
- Null hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is not related to self-efficacy.
- Alternative hypothesis 2: Students' level of satisfaction with mentorship opportunities in their first year of college is related to self-efficacy.

## **Brief Literature Review**

This section will describe the theoretical foundations of this study and review relevant literature as it relates to the proposed research methods. The literature supports three types of factors that comprise the proposed model for studying mentorship (a) interaction between mentors and protégés whose specific roles include having more and less expertise respectively, (b) investment of time developing the relationship, and (c) psychosocial benefits of mentorship. Scholarly sources summarized here were described in depth in Chapter 2.

There are three theoretical foundations that broadly support the three-part model proposed in this study.

- Kram's (1983) mentor relationship development theory outlines roles, investment of time, and benefits of mentorship.
- Bandura's (1977b) social cognitive theory (SCT) supports two parts of the model, roles and benefits of mentorship. SCT also unifies much of the supporting literature.
- The third theoretical foundation is Astin's Input-Environment-Output (I-E-O) model (Astin & Antonio, 2012) which guides the methodology of the proposed study.

## **Mentor Relationships Develop over Time**

Mentor relationship theory contributed to all three factors in this proposed research model, roles, investment of time, and benefits of mentorship. Mentor relationships evolve over time (Kram, 1983) through the formal or informal interaction (Schunk & Mullen, 2013) of a more experienced mentor with a less-experienced protégé. Mentor relationships grow through four basic stages, initiation, cultivation, separation and redefinition (Kram, 1983).

- 1. The initiation stage is characterized by the mentor recognizing the protégé has potential, and the protégé admires and respects the mentor. The protégé begins to feel "cared for, supported and respected by someone who is admired and who can provide important career and psychosocial functions" (Kram, 1983, p. 615). The initiation stage takes six to 12 months, after which time most of the benefits of mentorship accrue. Benefits include both career/intellectual development and psychosocial support. This proposed study is concerned with the initiation and cultivation stages, to find out if the benefits of cultivation are taking place for students within the first year of college.
- 2. The next phase, cultivation, lasts from two to five years. The positive expectations established during the initiation phase are tested as the mentor provides challenging work, coaching, exposure and visibility, protection and sponsorship, depending on the mentor's organizational rank, tenure and experience. As the interpersonal bonds strengthen, so do psychosocial benefits, depending on the degree of trust and intimacy. This could include modeling, acceptance-and-confirmation, counseling and friendship.
- 3. The third stage is separation, characterized by structural changes in organizational context, possibly with psychological changes in both or either individual.
- 4. The fourth stage is redefinition in which significant changes evolve in the relationship, possibly changing to a peer, colleague, or friendship status, or it may end entirely.

Mentor relationship development theory is explicit about time being an important factor in successful mentoring. Because relationships are all unique (Adler & Proctor, 2006), they pass
through stages at their own pace. With more time together, trust, respect, and other benefits of mentorship grow. Students' perceptions of whether academic leaders have time for them affects whether mentorship will be seen as a possibility, and whether it takes place. Frequency of interaction and opinions about the frequency of encouragement and emotional support reflect whether the time has been invested in making mentorship possible.

### Social Cognitive Theory (SCT)

The second theoretical foundation supports two of the three factors in the proposed model, roles and benefits of mentorship. SCT states that people reference four sources of information in judging their level of self-efficacy: (a) role models, (b) persuasion, (c) reduction of affective barriers, and (d) mastery experiences (Bandura, 1977b). Mentors are in a position to employ all four.

- Role models- are people who can teach by example, such as mentors.
- Persuasion- mentors are credible in convincing protégés to take action on their goals.
- Reduction of affective barriers- mentors encourage protégés and give them confidence to overcome fear and self-doubt.
- Mastery experiences- not only does mentorship directly cultivate self-efficacy, it also encourages students to try new things, experience success, and these mastery experiences add to self-efficacy information in a snowball fashion.

Self-efficacy is studied under many similar terms, including emotional health (Sax et al., 2005), grit (Duckworth, 2014), resilience (Clauss-Ehlers & Wibrowski, 2007), and buoyancy (Martin, 2013), decidedness (Bullock-Yowell, McConnell, & Schedin , 2014), self-confidence (Sax et al., 2005), and self-regulation (Zimmerman & Kitsantas, 2014). Some comparisons between these concepts were developed in Chapter 2, and charted in Figure 2.1, Table 2.1 and

Table 2.2. This study proposes the use of a series of self-ratings where students declare their self-confidence regarding intellect and academic ability, cooperativeness, drive to achieve, emotional health, persistence and social self-confidence.

# Astin's Input-Environment-Output Model

The third theoretical foundation, Astin's I-E-O model, guides the method of analysis for this study. "Any educational assessment project is incomplete unless it includes data on student inputs, student outcomes, and the educational environment to which the student is exposed" (Astin & Antonio, 2012, p. 32). The I-E-O model first identifies and analyses incoming students for factors that could influence the outcome being studied. After controlling for input variables such as demographics and prior academic success, it is then possible to study the effects of environmental factors- in this case mentorship experiences, on the output being studied- in this case, student self-efficacy.

# **Mentorship Roles**

Tinto's work on student persistence describes the need for academic, social and personal support, especially in their first year of college (Tinto, 2002). Support may be structured through many programs, including formal or informal mentorship, contact with faculty, advisors, counselors and staff. Support needs to be readily available and connected to other parts of the student collegiate experience.

The mentor protégé relationship is unique, and personal. Scandura and Ragins (1993) described mentorship as including three factors, role modeling, career development, and psychosocial support. This is consistent with SCT calling for role models, persuasion/explicit advice, and reduction of affective barriers.

Allen, Eby, and Lentz (2006) found that more modeling occurs when mentors are ranked higher than their protégés. When mentors have a say in the match to a protégé, both parties rate the mentorship experience as being higher quality. This suggests that effective role modeling is enhanced by the exercise of free will.

**Faculty interaction.** Faculty have the greatest exposure to students over the course of their education. Contact with faculty outside of class is related to the quality of student-faculty relationships (Lundberg & Schreiner, 2004). Lundberg and Schreiner found that satisfaction with faculty is a function of being approachable, helpful, understanding, and encouraging. As levels of satisfaction with faculty interaction increased, the level of progress on career development, scientific reasoning, intellectual development and problem solving also increased.

While faculty interaction was valued, not all faculty interaction was considered positive (Sax et al., 2005). "The quantity of students' involvement with faculty must be understood in the context of the quality that defines such interactions. In other words, frequent encounters with faculty do not necessarily translate into beneficial outcomes" (p. 644). This speaks to the need to critically evaluate different kinds of faculty/student interaction, and to consider the impact of other kinds of mentoring opportunities on campus.

Academic advisors, counselors and other staff. Students' sense of self-efficacy grew when given certain mentorship experiences with academic advisors and counselors (Clauss-Ehlers & Wibrowski, 2007; Erlich, 2011; Erlich & Russ-Eft, 2011, 2012, 2013). Allen, Eby, and Lentz (2006) found that regular meetings and set goals and objectives were valued; these interactions are characteristic of many successful academic advising practices.

This brief summary of literature shows that mentoring requires choices between experienced professionals and receptive student protégés, and can positively affect student success. Mentoring can take place between students and their faculty, advisors, counselors, or staff. By correlating mentorship opportunities with changes in student self-efficacy over the course of their college experience, this study could inform how academic leaders can be more effective as mentors. A broad look at mentoring opportunities on campus is warranted

### Methods

This section will summarize the research objectives and philosophical approach of this study. A close examination of the sample population, dataset, and variables will follow. The procedures for analysis of the data will conclude this chapter.

This study will look at a variety of student experiences to see how different faculty interactions and satisfaction with advising and counseling, and staff are connected to gains in student self-efficacy. It will be useful to know which mentorship interactions are most closely aligned with increases in student self-efficacy. This could help faculty and student service professionals plan their programs and prioritize their interactions with students.

### **Philosophical Approach and Scholarly Significance**

This study uses a post-positive approach. Such an approach derives from positivism. Positivism developed during the early 1800's when Compte said society could be studied scientifically through observation, rather than religiously or in terms of logic or natural law (Babbie, 2004). Positivism is a scientific philosophy that holds there is an objective truth that scientific practices can uncover using measurement and experimentation (Kezar, Carducci, & Contreras-McGavin, 2006; Trochim, 2006). Merriam (2009) explained:

A positivist orientation assumes that reality exists "out there" and it is observable, stable, and measurable. Knowledge gained through the study of this reality has been labeled "scientific" and included the establishment of "laws." Experimental research assumed a positivist stance. The rigidity of this perspective has given way to logical empiricism and post-positivism. (p. 8)

There are four problems with such foundationalist thought, (a) its inability to reduce principles of verification and induction through logic and mathematics to sensory experience, (b) distinctions made between analytic and synthetic statements can be argued against convincingly, (c) observation is theory laden, and (d) the foundational argument that removes experienceable features for analysis "leaves nothing left about which to make assertions" (Von Dietze, 2001, p. 18).

Post-positivism builds on the positivist paradigm with the realization that there is no such thing as objectivity (Trochim, 2006). Kuhn's discussion regarding "scientific paradigms" launched a revolution in scientific thought, and post-positivism was born (Kuhn, 1996; Von Dietze, 2001). Everyone brings their own reasoning, biases, and cultural lenses to the interpretation of information. Post-postivism helps overcome the problem of underdetermination, meaning that evidence may be interpreted through multiple different theories. Because observation is fallible, post-positivism holds that it is important to triangulate toward understanding an objective reality by revisiting concepts, retesting hypotheses, seeking larger samples for testing, and building on others' findings. While knowledge is relative rather than absolute, empirical evidence helps the researcher distinguish the plausibility between claims (Merriam, 2009). In this way, the peer review process helps the community of scholars develop more reliable information.

Consistent with the post-positivist paradigm, this study builds on concepts that are established in the body of knowledge, yet looks at student experiences using a slightly different theoretical perspective. The studies I have found that used the large samples of this database look generically at faculty-student interaction, or academic outcomes; they did not frame their findings in terms of mentor relationship development theory or SCT. By approaching the same survey results through a different theoretical lens, this study offers a new perspective on existing data, and offers the opportunity to overcome different types of error risk.

Further, most studies of mentorship that I have found use small samples of under 225 students from the same campus or program. In contrast, this proposed model makes it possible to study the benefits of mentorship opportunities using longitudinal survey data from an existing sample of thousands of first-year college students, collected from many different campuses. Further, I have not found another study that examines mentorship opportunities across a variety of campus professionals, nor tested their influence on the multiple expressions of student selfefficacy found in this study.

### **Personal Disclosure**

The author's interest in the topic of mentorship and student self-efficacy comes from experience as communication studies faculty at the community college level. Almost all of my community college students were in a state of transition, enrolled while they discovered what their next step in life should be. The communication studies classroom is a place that explores how we meet our needs through competent interactions with the people in our lives. Students' unstated desire for mentorship was evidenced in many non-verbal behaviors, such as lingering after class, or waiting for me after I had already answered their questions, as if they felt incomplete and still wanted to talk, but did not know what about. I used these opportunities to ask them about their degree goals, their motivations for attending college, and what they wanted to do after they graduated. I listened therapeutically, wrote letters of recommendation, and referred them to classes, programs and conferences that might align with their interests. A few students disclosed personal and troubled stories about great challenges they needed to overcome. Many have stayed in touch for nearly a decade. Their trust honored me and I felt the benefits of being a faculty mentor.

Yet mentorship was time-consuming, and faculty members were not compensated for the extra time. I suspected that the unmet need for mentorship was great and the potential benefits to students would be powerful. When I discovered the HERI surveys, I saw potential for learning about mentorship opportunities on a larger scale. As I found factors in the surveys representing mentorship opportunities and self-efficacy, the faces of my own students came to mind. And the chance to see what 12,000 students had to say about their mentorship opportunities grew into this proposed study.

#### **Data, Sample Population, Survey Instruments**

This study will build on the body of knowledge gained via a highly reliable, nationwide survey (Higher Education Research Institute, 2014a). A 2011 database of surveys completed by thousands of students from hundreds of two and four year institutions nationwide (Higher Education Research Institute, 2014a) responded to questions on their college experiences, including their interactions with academic professionals, and their self-confidence in many different areas. The Higher Education Research Institute (HERI) administers annually and nationwide The Freshman Survey (TFS) (Higher Education Research Institute, 2014a) and one year later Your First College Year Survey (YFCY) (2014c). Students' responses between the time they enter as freshmen to the end of their first year of college were connected by their student identification number, making longitudinal study possible. TFS covers a wide range of incoming student characteristics including demographics, high school achievement and activities, career plans, values, attitudes, beliefs and self-concept (Higher Education Research Institute, 2014a). The YFCY provides follow-up questions for pre- and post-test comparisons (Higher Education Research Institute, 2012, 2014c).

# **Human Subjects**

This study is strengthened by the guidance of two Institutional Review Boards (IRB), University of California, Los Angeles (UCLA) and Oregon State University (OSU). The HERI survey has been conducted under the supervision and approval of UCLA's IRB (Higher Education Research Institute, 2014a). Oregon State University's policies call for submission of a determination form to approve this study (Institutional Review Board, 2015). Additionally, the author of this proposal has completed CITI training in ethical research practices (CITI Program, 2014).

### Variables

Variables have been selected from these surveys because they are reflective of the theories this study is designed to test, specifically the connection between mentorship opportunities and changes in self-efficacy across the freshman year of college. The variables for study are charted in Table A.1 according to the proposed model of roles, time and benefits.

**Input variables.** The dependent variables that represent self-efficacy will be compared before and after the first year of college. It will also be necessary to control for input variables that predispose differences in self-efficacy. The variable representing average high school grades was chosen as a control for prior academic achievement, because mastery experiences have a positive effect on self-efficacy (Bandura, 1977b). While this variable has the weakness of being a self-reported average of high school grades, it has the advantage of comparing longitudinally with student's self-reported average grades a year later. This study will control for gender because women may interpret faculty encounters differently from men (Sax et al., 2005). Members of underrepresented minority groups often arrive at college with higher levels of engagement (Center for Community College Student Engagement, 2014), yet lower rates of success, so this study will control for ethnicity and first generation students. The variable of mother's education will be used as a proxy for socio-economic status (SES). Community colleges especially include students from a wide range of ages and life stages, so controlling for age is included as an exploratory variable.

Environmental variables. Students reported on TFS and YFCY various opportunities to engage with faculty, advisors, counselors, and staff as potential mentors (Higher Education Research Institute, 2014a). These independent variables are charted in detail in Table A.1, and include factors of (a) time invested with the student, (b) roles such as faculty, advisors, counselors or staff, and (c) benefits of mentorship. Time factors are reflected in questions about (a) the number of hours per week spent with academic professionals, (b) opinions about the frequency of encouragement, and support, (c) frequency of interaction during or outside of office hours, and (d) actions taken in college to communicate regularly with academic professionals. With the factor of time being asked several different ways such as in terms of hours, frequency, actions, satisfaction, and opinions; students are given many ways to frame their answers, and this provides the opportunity to overcome some error risk. Another study (Bowman & Seifert, 2011) used both frequency of and satisfaction with student-faculty interactions to measure students' perceptions of personal growth. While their study measured different dependent variables, there are some commonalities for the purpose of independent variable selection. Bowman and Seifer found that frequency and satisfaction of contact yielded approximately the same results. Following their example, this study will use both frequency and time in analyzing interactions

with potential mentors. Factor analysis will reveal whether these variables are redundant or conflicting, and if so, one will be eliminated or they will be combined as appropriate.

Role factors pertain to the questions about which academic professionals students have interacted with during their first year of college. There are 12 questions that address interactions with faculty, five for academic advising and counseling, and three pertaining to staff. This means that there are a different number of questions for each category and the study is not balanced. "Balance is generally desirable in providing equal accuracy for all treatment comparisons, but it is not essential" (Ramsey & Schafer, 2002, pp. 224-225). This collection of variables represents the best data available. These variables are each measured on three to five point Likert scales regarding frequency, degree of agreement, and student satisfaction. This makes it possible to analyze all role factors as continuous variables, while grouping them by roles as a block in regression analysis.

**Output.** Dependent variables to be studied include seven different expressions of student self-efficacy; intellectual self-confidence, academic self-confidence, ability to work as part of a team/cooperativeness, drive to achieve, emotional health, and social self-confidence (Higher Education Research Institute, 2014a). A detailed Table of Variables is charted in Table A.2. It includes wording of the survey items, scale measurements for each survey question, coding, as well as annotations connecting each survey question to the scholarly citation that justifies its inclusion in this study.

# Analysis

Quantitative data analysis involves several steps (Creswell, 2012), first prepare the data, second, begin the analysis with descriptive statistics, including measures of central tendency and variation. Then conduct more sophisticated inferential analysis to test hypotheses and examine

confidence intervals and effect sizes. The third step is to report the results using tables, figures, and a discussion of key findings. Forth, interpret and summarizing results, comparing them with past literature and theories, advancing the limitations of the study, and ending with suggestions for future research.

To prepare the data, minimal scoring will be needed. The demographic variables are mostly categorical, except for age and average grades which are ordinal. The dependent variables which measure self-efficacy were all structured on scales of one to five points with one being the lowest possible and five being the highest possible.

The proposed analysis will begin by correlating the variables using SPSS software. "Correlation researchers use the correlation statistic to predict future scores" (Creswell, 2012, p. 349). The P value, or risk of type I error, is set at a .05 level of significance. Two tailed tests are preferred because the possibility of negative correlation is just as important as the possibility of positive correlation.

Factor analysis will be run on the dependent variables in order to confirm that the selfefficacy construct has validity and is unitary. It will also identify variables that overlap and combine them into one construct. Factor analysis will also be run on the independent variables. This is important because many of the questions on the topic of time ask essentially the same question framed differently, such as hours, frequency, campus satisfaction with frequency, and how often an activity took place. It will be useful to identify which phrasing elicited unique variables. Factor analysis offers the additional benefit of identifying variables that are related to each other, as well as maximizing the population size for each variable, and thereby reducing the sampling error, and enhancing the validity of the study (Creswell, 2012). Factor analysis identifies and generates a factor or scale from a set of related items. Conducting it contributes to parsimony by reducing the number of similar independent variables in a regression model. It reduces multicollinearity among independent predictors and increases variance in outcome variability by combining similar items that can be explained by an underlying construct (Eagan, 2015).

The next step will be to conduct a five block regression analysis with the I-E-O model as a framework (Astin & Antonio, 2012). This is "to see what impact multiple variables have on an outcome" (Creswell, 2012, p. 349). The first block will control for students' incoming attributes, such as demographics, prior academic achievement and their self-efficacy scores on arriving at college. After separating the variability attributed to the first block of input variables, the remaining effect of college environmental factors could be analyzed. The second block will analyze faculty interactions. The third block will analyze counseling and advising interactions. The fourth block will analyze the degree to which staff had taken an interest in the student's development. The fifth block will consider as an exploratory variable, which kind of institution students attended. This provides the opportunity to explore institutional markers for multicultural organizational development (Wall & Obear, 2008), as well as discover any clustering effects, where "students within institutions behave more similarly to each other than to students at other institutions" (Salisbury, Pascarella, Padgett, & Blaich, 2012).

### **Issues of Reliability and Validity**

The reliability of the factors will be calculated using Cronbach's Alpha. The validity of this study relies on the integrity of the survey design (Creswell, 2012). Creswell's criteria for good instruments are satisfied:

- The most recent survey available will be utilized.
- CIRP surveys are widely cited by other authors

- Reviews are available.
- The reliability and validity of TFS and YFCY has been published in the body of knowledge, and is available for review (Pryor, DeAngelo, Blake, Hurtado, & Tran, 2011).
- The procedure for recording data fits the hypotheses in this study.
- The instrument contains accepted scales of measurement. Specifically, the response variables represent valid ways of measuring self-efficacy (Bandura, 2012). Bandura stated that a scale for self-efficacy should never include a value lower than zero, nor include a statement of intention such as *I will accomplish*. A measurement of self-efficacy should not measure a specific skill, such as writing ability. And the scale should include more than three values because "individuals who judge themselves inefficacious for very difficult performance are likely to differ in their efficacy for intermediate levels of performance" (p. 17). All survey questions included in this study have been chosen as consistent with Bandura's standards for evaluating self-efficacy.

# Limitations

The variables used in this study are self-reported, and come with their own weaknesses. Self-reported data is a function of what people think, and not what they do (Creswell, 2012). While this is appropriate for self-efficacy measures (Bandura, 2012) and measures of satisfaction or opinion, the time variables are not objective measurements of hours or frequencies of activities. The average grades are also self-reported, not transcripts or other objective sources for grades awarded. These variables are being analyzed with the realization that they are framed by students' perception of what constitutes sufficiency of time and frequency, as well as their selfconcept of the grades they earn.

This sample is limited to students who persisted in their education for at least a full year. Most of the students in this sample are from four year institutions, though a few community colleges participated. This sample does not include students who (a) met their educational goals in less than a year, or (b) were community college students who took the survey as incoming freshmen but transferred to a university that did not participate in YFCY.

Additionally, institutions that participated in TFS and YFCY have resources for institutional research. This makes them more affluent than most community colleges as well as the average four year institution. This means that the population sample includes a bias toward students inclined to attend more expensive colleges. We will not be able to conclude that the average college student will respond to mentorship opportunities the same way as this population sample may indicate. That said, this sample population does consist of college students, and these findings could inform ways of supporting this unique subpopulation of students.

#### Summary

This section summarized the purpose and significance of the proposed study. The hypotheses were supported by a rigorous research plan. The post-positivist philosophical approach called for a personal disclosure, revealing the author's personal interest in student mentorship. The population for study has been identified, as well as the variables to be examined and methods for conducting the proposed study and analyzing the data. This chapter has summarized the literature that justifies these decisions and strengthen the rationale for each step. Issues regarding reliability and validity of the data, and the procedures for protecting

human participants have been described. The next sections will describe the findings, discuss their implications, and make recommendations for future research.

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# Table A.1

# Three factors for studying mentorship

Roles	Time invested in mentorship	Benefits of mentorship
Explanatory variables	Explanatory variables	Response variables
Faculty interaction		
AC103: Been a guest in a	HPW13: Hours per week	RATE23: Self Rating:
professor's home	spent talking with professors outside of class	(post-test)
INSOPN18: Inst opinion:		
Faculty encouraged me to meet	COLOP05: Opinion about	RATE02: Self Rating:
with them outside of class	the frequency that faculty encouraged me to meet with	Academic ability
CLSACT14: Faculty provide	them outside of class	RATE08: Cooperativeness
advice and guidance about your		(RATE0405_N_TFS 2005)
educational program	CLSACT15: Frequency that	
	faculty provide emotional	SLFCHG04:Change:
SUCCESS4: Success at getting	support and encouragement	Ability to work as part of a
to know faculty		team
	INTACT06: Frequency of	(RATE01, 2005)
EASY7: Easy to get to know	interaction with faculty	
faculty	outside of class or office	RATE11: Drive to achieve
	hours	(RATE0408_N_TFS 2005)
CMPSAT01:Campus		
satisfaction with the amount of	INTACT05: Frequency of	RATE12: Emotional health
contact with faculty	interaction with faculty during office hours	(RATE0409_NTFS 2005)
	e	RATE17: Persistence
	CLSACT15: Frequency that	(2003, 2004)
	faculty provide emotional	(RATE0401_N_TFS,
	support and encouragement	2002, 2003, 2004)
	COLACT05: Act in college:	RATE16 TFS: Social self-
	communicated regularly with	confidence
	your professors	(RATE0419_N_TFS 2005)
		CURRGPA: grade average

Advising and Counseling interaction

SATIS01: Satisfaction with academic advising	INTACT01: Frequency of interaction with academic advisors/counselors
SATIS03: satisfaction with career counseling and advising	CLSACT27: Frequency of act in class: Worked with an academic advisor to select
SERVICES08: Satisfaction with	your courses
services, academic advising	
Staff interaction	
Staff interaction	
COLOPN39: Opinion: Staff here	No frequency
is interested in students'	variables are
academic problems	available
	regarding staff
COLOPN40: Opinion that staff	interaction
here is interested in students'	
personal problems	

COLOPN41: Opinion that staff recognizes my achievements

Variables are questions answered by students in The Freshman Survey and Your First College Year.

# Table A.2

Table of Variables

Survey	Variable	Original and	References
5	Name and	Final Coding	
	Description	6	
Depende	ent Variables		
YFCY	RATE23: Self	1= Lowest 10%	"Your self-concept and self-esteem
	Rating:	2= Below average	filter every interaction with others.
	intellectual self-	3= Average	They determine how you approach,
	confidence	4= Above average	respond to, and interpret messages"
	(post-test)	5= Highest 10%	(Beebe et al., 2005, p. 49).
YFCY	RATE02: Self	1= Lowest 10%	Perceived self-efficacy has been
	Rating:	2= Below average	successfully applied to academics,
	Academic	3= Average	career development, health and other
	ability	4= Above average	aspects of college life (Erlich & Russ-
		5= Highest 10%	Eft, 2011).
YFCY	RATE01: Self	1= Lowest 10%	Students learn best when they are
	Rating: Ability	2= Below average	interested and engaged in cooperative
	to work as part	3= Average	groups, working to solve complex
	of a team	4= Above average	problems (Kober, N., 2015).
		5= Highest 10%	
YFCY	RATE11: Drive	1= Lowest 10%	Students who are motivated feel self-
	to achieve	2= Below average	efficacious, persist at tasks and
		3= Average	typically use effective self-regulatory
		4= Above average	strategies to learn (Schunk, Pintrich &
		5= Highest 10%	Meece, 2008).
YFCY	RATE12:	1= Lowest 10%	Social Learning Theory states that
	Emotional	2= Below average	affective barriers are an important
	health	3= Average	source of self-efficacy information.
		4= Above average	This self-report assessment of
		5= Highest 10%	emotional health could be reflective of
			affective barriers (Bandura, 1977b).
YFCY	RATE17:	1= Lowest 10%	Research has shown self-efficacy
	Persistence	2= Below average	beliefs to have significant predictive
		3= Average	impact on behaviors such as choice of
		4= Above average	activities, effort, and persistence
		5= Highest 10%	(Bandura, 1997, Erlich, 2011;
			Zimmerman, 1989). "People who have
			been reinforced both directly and

			vicariously persevere longer in the face of no reward than do those who have experienced direct reinforcement alone" (Bandura, 1977b, p. 123).
YFCY	RATE24:	l = Lowest 10%	Learning is a social process (Kober, N., 2015). Students construct
	confidence	2– Delow average	understanding through social
	connucliee	4= Above average	interactions, such as talking about and
		5 = Highest  10%	collaborating on meaningful learning
		6	activities. Social interactions also have
			a positive effect on motivation
			(Vygotsky & Cole, 1978)
FIS	RATE15_TFS:	1= Lowest 10%	Students who agreed their experiences
	Self Rating:	2= Below average	with faculty and peers had positively
	Intellectual self-	3= Average	influenced development consistently
	confidence (pre-	4= Above average	exhibit larger gains than do other
VEON	test)	5 = Highest 10%	students (Bowman & Seifert, 2011).
YFCY	CURRGPA:	I = do not receive grades	Students who agreed their experiences
	grade average	in my courses	influenced development consistently
		2=D 3+C	avhibit larger gains then do other
		3+C	students (Bowman & Seifert 2011)
		4–C+ 5–B-	students (Bowman & Senert, 2011).
		5=B- 6=B	
		5 B 7=B+	
		8=A-	
		9=A or A+	
Indepen	dent Variables		
Input Bl	lock I	1 1 1	
FIS	SEX_TFS:	I = Male	Male and female students respond to
	Gender	2 = Female	al., 2005).
FIS	SATV_TFS:	Fill in three digit value	Social Learning Theory says that

SAT Verbal

al., 2005). Fill in three digit value Social Learning Theory says that mastery experiences are an important source of self-efficacy information. SAT and ACT scores are a marker of prior academic success, and potentially influence perceived self-efficacy. For this reason, SAT and ACT scores

			will1be used as control variables (Bandura, 1977b)
FIS	SATM_TFS: SAT Math	Fill in three digit value	Social Learning Theory says that mastery experiences are an important source of self-efficacy information. SAT and ACT scores are a marker of prior academic success, and potentially influence perceived self-efficacy. For this reason, SAT and ACT scores will be used as control variables (Bandura, 1977b)
FIS	HSGPA:	1 = D	Social Learning Theory says that
	average grade	2 = C	mastery experiences are an important
	in high school	3 = C +	source of self-efficacy information.
	C	4 = B-	Average high school grades are a
		5 = B	marker of prior academic success, and
		6 = B +	potentially influence perceived self-
		7 = A-	efficacy. For this reason, average high
		8 = A  or  A +	school grades will be used as control
			variables (Bandura, 1977b).
FIS	AGE1_TFS:	1 = 16 or younger	Age is included as an exploratory
		2 = 17	variable. The average age of students
		3 = 18	at community colleges is older than at
		4 = 19	four year institutions. These older
		5 = 20	students are more likely to be seeking
		6 = 21-24	career advancement or a new career
		7 = 25-29	(Booth & Bahr, 2013). To stay
		8 = 30-39	enrolled, older students "must believe
		9 = 40-54	that higher education is an important
		10 = 55 or older	part of their lives" (Karp, 2011, pg. 1).
FIS	RACEGROUP:	1.00 = White	College achievement has a race
		2.00 = Asian	component, with Blacks and Latinos
		3.00 = Latino	graduating in lower numbers than their
		4.00 = Black	white counterparts, in spite of higher
		5.00 = Amind	engagement (Center for Community
		recoded	College Student Engagement, 2014b).

<ul> <li>YFCY INTACT2: I = Never Discussing coursework outside of class 3 = 1 or 2 times per term outside of class 3 = 1 or 2 times per month 4 = Once a week 5 = 2 or 3 times per week 6 = Daily</li> <li>YFCY INSOPN14: I =Disagree strongly Opinion: At 2 = Disagree term taken an interest in my development 4 = Satisfied 5 = Agree strongly development 4 = Satisfied 5 = Agree and mentors" (Schunk &amp; Mullen, 2006).</li> <li>YFCY COLOPN03: I =Strongly disagree to Opinion: 2 = Disagree to Opinion: 2 = Disagree to Color where the faculty showed 3 = Agree and mentors where the phal input into the matching process" (2006, p. 567).</li> <li>YFCY COLOPN03: I =Strongly disagree to Opinion: 2 = Disagree to Student perception of the quality of the faculty 3 = Agree and mentors where the phal input into the matching process (2006, p. 567).</li> <li>YFCY COLOPN05: I =Disagree to Student perception of the quality of the faculty 3 = Agree and the faculty and the student perception of the quality of the faculty 3 = Agree the matching process (Allen et al., 2006).</li> <li>YFCY COLOPN05: I =Disagree to student perception of the quality of the faculty 3 = Agree the moutside of class</li> <li>YFCY CMPSAT01: I =Can't rate/No faculty engagement variables positively influenced students' investment of energy in academic Amount of 3 = Neutral</li> </ul>	YFCY	COLOPN03: Faculty believe in my potential to succeed academically	<ul><li>1= Strongly disagree</li><li>2= Disagree</li><li>3= Agree</li><li>4= Strongly agree</li></ul>	Satisfaction with faculty is a function of being approachable, helpful, understanding, and encouraging (Lundberg & Schreiner, 2004). Encouragement helps reduce affective barriers, thereby increasing self- efficacy Bandura, 1977b)
<ul> <li>YFCY INSOPN14: 1=Disagree strongly Opinion: At 2= Disagree least one faculty 3= Agree member has 4= Satisfied taken an interest 5=Agree strongly in my development</li> <li>YFCY COLOPN03: 1=Strongly disagree Opinion: 2=Disagree</li> <li>YFCY COLOPN03: 1=Strongly disagree Opinion: 2=Disagree</li> <li>YFCY COLOPN05: 1=Disagree strongly agree my progress</li> <li>YFCY COLOPN05: 1=Disagree strongly disagree</li> <li>YFCY COLOPN05: 1=Disagree strongly agree my progress</li> <li>YFCY COLOPN05: 1=Disagree strongly opinion: 2= Disagree</li> <li>YFCY COLOPN05: 1=Disagree strongly development</li> <li>YFCY COLOPN05: 1=Disagree strongly my progress</li> <li>YFCY COLOPN05: 1=Disagree strongly opinion: 2= Disagree</li> <li>YFCY COLOPN05: 1=Disagree strongly development</li> <li>YFCY COLOPN05: 1=Disagree strongly development</li> <li>YFCY CMPN3T01: 1=Can't rate/No class</li> <li>YFCY CMPSAT01: 1=Can't rate/No campus experience</li> <li>YFCY MPSAT01: 1=Can't rate/No</li> <li>YFCY CMPSAT01: 1=Can't rate/No&lt;</li></ul>	YFCY	INTACT2: Interact: Faculty outside of class or office hours	1= Never 2= 1 or 2 times per term 3= 1 or 2 times per month 4= Once a week 5=2 or 3 times per week 6=Daily	Discussing coursework outside of class with faculty is related to the quality of student-faculty relationships (Lundberg & Schreiner, 2004).
YFCYCOLOPN03:1=Strongly disagreeFaculty encouragement is tied toOpinion:2=Disagreestudent perception of the quality of the relationship with faculty membersFaculty showed3=Agreerelationship with faculty membersconcern about4=Strongly agree(Allen et al., 2006).my progress9Faculty encouragement is tied to opinion:YFCYCOLOPN05:1=Disagree stronglyFaculty encouragement is tied to student perception of the quality of the quality of the quality of the relationship with faculty membersYFCYCOLOPN05:1=DisagreeYFCYCOLOPN05:1=DisagreeFaculty3= Agreerelationship with faculty membersencouraged me4= Satisfied(Allen et al., 2006).to meet with5=Agree strongly them outside of classFaculty engagement variablesYFCYCMPSAT01:1=Can't rate/No Satisfaction:Faculty engagement variables positively influenced students' investment of energy in academic endeavors. Quality of relationships	YFCY	INSOPN14: Opinion: At least one faculty member has taken an interest in my development	1=Disagree strongly 2= Disagree 3= Agree 4= Satisfied 5=Agree strongly	When mentors have a say in the match to a protégé, mentorship quality is higher (Allen et al., 2006). "Researchers have linked mentoring with positive outcomes for protégés and mentors" (Schunk & Mullen, 2013, pg 361). Allen et al. found that "Protégés were more satisfied with their mentor when they had input into the matching process" (2006, p. 567).
<ul> <li>YFCY COLOPN05: 1=Disagree strongly Opinion: 2= Disagree</li> <li>Faculty 3= Agree</li> <li>encouraged me 4= Satisfied</li> <li>to meet with 5=Agree strongly</li> <li>them outside of</li> <li>class</li> <li>YFCY CMPSAT01: 1=Can't rate/No</li> <li>Campus experience</li> <li>Satisfaction: 2= Dissatisfied</li> <li>Amount of 3= Neutral</li> <li>Faculty encouragement is tied to</li> <li>student perception of the quality of the relationship with faculty members</li> <li>(Allen et al., 2006).</li> <li>Faculty engagement variables</li> <li>positively influenced students'</li> <li>investment of energy in academic</li> <li>endeavors. Quality of relationships</li> </ul>	YFCY	COLOPN03: Opinion: Faculty showed concern about my progress	1=Strongly disagree 2=Disagree 3=Agree 4=Strongly agree	Faculty encouragement is tied to student perception of the quality of the relationship with faculty members (Allen et al., 2006).
YFCYCMPSAT01:1=Can't rate/NoFaculty engagement variablesCampusexperiencepositively influenced students'Satisfaction:2= Dissatisfiedinvestment of energy in academicAmount of3= Neutralendeavors. Quality of relationships	YFCY	COLOPN05: Opinion: Faculty encouraged me to meet with them outside of class	<ul> <li>1=Disagree strongly</li> <li>2= Disagree</li> <li>3= Agree</li> <li>4= Satisfied</li> <li>5=Agree strongly</li> </ul>	Faculty encouragement is tied to student perception of the quality of the relationship with faculty members (Allen et al., 2006).
	YFCY	CMPSAT01: Campus Satisfaction: Amount of	1=Can't rate/No experience 2= Dissatisfied 3= Neutral	Faculty engagement variables positively influenced students' investment of energy in academic endeavors. Quality of relationships

	contact with	4= Satisfied	with faculty was the only variable that
	faculty	5=Very satisfied	significantly predicted learning for all
			the racial/ethnic groups (Lundberg &
			Schreiner, 2004).
YFCY	CMPSAT01:	1=Can't rate/No	Mentors report more modeling occurs
	Campus	experience	when they are at a rank higher than
	Satisfaction:	2= Very dissatisfied	their protégés, such as the difference
	Amount of	3=Dissatisfied	between students and faculty (Allen et
	contact with	4=Neutral	al., 2006). Frequency of contact
	faculty	5=Satisfied	influences satisfaction with faculty,
		6=Very satisfied	which increases the level of progress in
			scientific reasoning, as well as career
			development, intellectual development
			and problem solving (Lundberg &
			Schreiner, 2004).
YFCY	SUCCESS4:		Mentors report more modeling occurs
	Success:		when they are at a rank higher than
	Getting to know		their protégés, such as the difference
	faculty		between students and faculty (Allen et
			al., 2006).

# Block 3 Advisors and counselors

YFCY	SATIS01:	1=Can't rate/No	Academic and career advising was
	Saustaction:	2 Dissotiatian	found to be effective at cultivating
	Academic	2= Dissatisfied	student self-efficacy when a protocol
	advising	3= Neutral	designed around Social Learning
		4= Satisfied	Theory was used (Erlich, 2011).
		5=Very satisfied	
YFCY	SATIS03:		As the levels of satisfaction with
	Satisfaction:		faculty interaction increased, the level
	Career Services		of progress on career development also
			increased for students (Lundberg &
			Schreiner, 2004). Undecided college
			students regarding career goals are
			equally willing to commit to a career
			plan, but may lack career information
			(Bullock-Yowell et al., 2014).
YFCY	SERVICES08:	Since entering this	Students who contacted advisors scored
	Services:	college, how often have	higher on all knowledge and attitudes
			consistent with continuing at their

	Academic advising	you utilized the following services: 1=Not at all 2= Occasionally	institution and completing their educational program (Smith & Allen, 2014).
YFCY	SERVICES07: Services: Career Services	S= Frequently Since entering this college, how often have you utilized the following services: 1=Not at all 2= Occasionally 3= Frequently	Academic and career advising was found to be effective at cultivating student self-efficacy when a protocol designed around Social Learning Theory was used (Erlich, 2011).
YFCY	INTACT01: Interact: Academic advisors/counse lors	Since entering this college, how often have you interacted with the following people? Academic advisors/counselors 1=Never 2=1 or 2 times per term 3=1 or 2 times per month 4=Once a week 5=2 or 3 times per week 6=Daily	Students who contacted advisors scored higher on all knowledge and attitudes consistent with continuing at their institution and completing their educational program (Smith & Allen, 2014).
Block 4	Staff		
YFCY	COLOPN02: At least one staff member has taken an interest in my development	1=Disagree strongly 2= Disagree 3= Agree 4= Satisfied 5=Agree strongly	Mentors report more modeling occurs when they are at a rank higher than their protégés, such as the difference between students and staff (Allen et al., 2006).
Block 5	Institution		
YFCY	Comparison Groups	<ul><li>1-3 Public</li><li>Universities</li><li>4-6 Private</li><li>Universities</li><li>7-10 Public four-year</li></ul>	Institutional comparison is included as an exploratory variable (Wall, 2008).

colleges 11-15 Private nonsectarian four-year colleges 16-19 Catholic four-year colleges 20-24 Other religious four-year colleges 25-29 Two-year Colleges 30-33 Historically Black Colleges & Universities

### Appendix B

## Missing Data Analysis

When conducting statistical analysis, it is important to analyze the database for missing values (Enders, 2010). This is to determine whether a "pattern of missingness" (Harrington, 2009, p. 37) could affect the quality of results or distort any inferences. "Unfortunately, there are no firm guidelines for determining what quantity of missing data is too much for a given sample size. Those decisions still rest largely on the shoulders of the researcher" (Mertler & Vannatta, 2013, p. 27). For this study, the missing data analysis began with basic demographics.

The first step was to calculate descriptive statistics. The sample of 15,855 student surveys included about 60 variables. All subjects were complete regarding institution type, and nearly complete for gender, ethnicity, and high school GPA. For parent's education, the highest rate of missingness of 3.2% was for Father's education. However, 10.3% of respondents did not answer the question "What is your best estimate of your parents' income last year?" It was important to find out if income information, a function of SES, was available across all populations. Further study was needed to determine if responses were missing at random (MAR), missing completely at random (MCAR) or missing not at random (MNAR).

Little's MCAR test (Little, 1986) revealed a Chi-Square that was statistically significant with a P-value of less than .001. This indicated that data were not MCAR. The next step was to study any pattern of missingness. The most important thing was to assure whether the data included broad representation from all populations for each variable.

# **Income and Ethnicity**

Cross-tabulations of covariances between all variables and the estimated variables were calculated to find relationships among missing data. Of particular interest was the validity across demographics of the SES scale that was created for this study. With covariance of .4714, White

students were more likely to respond to the question of income than their classmates of color. Hispanics respondents co-varied with missing income responses at -.1687, Blacks at -.1154, and Asians at -.1234. Looking closer at the Hispanic sample, a series of crosstabs indicated that all possible values from 1 to 30 on the 30 point SES scale were represented. Analysis of dummy coded variables indicated that missing income data was no more likely for students being Hispanic than for students who were not Hispanic. Crosstabs between Race/Ethnicity groups and SES indicated that the percent of missing responses were roughly proportionate to the sample population size.

The pattern of missingness may have been related either to cultural differences, or to income disparities between the ethnicities, which is well documented elsewhere (e.g., Patten, 2016; Wilson, 2015). This study controlled for ethnicity and SES in the block regression analysis to account for these disparities. It was determined that the missingness was not significant enough to invalidate the study.

#### **Dependent Variable, Academic Self-confidence**

Academic self-confidence had a 9.9% rate of missing responses. Crosstabs of covariance indicated that students who withheld a response on the pre-freshman year survey were more likely to withhold a response on the post-freshman year survey with a covariance of .519, considered by Salkind (2011) to be a moderate correlation. It seemed logical that students who didn't care to share that information in the beginning also did not share that information at the end. The next highest rate of covariance was with Income at .3608, considered to be a weak relationship, but studied further below. There were no meaningful correlations between demographic populations and missing dependent variable responses.

### **Independent Variables**

Some missing variables were related logically regarding the subject matter measured. For example, students who did not provide a response regarding emotional health also tended to not answer regarding social self-confidence, which covaried at .4665. Missing High school GPA scores covaried with missing Drive to achieve responses at .2431.

Five variables regarding interacting with faculty had some level of missing response covariance. The highest was between Interacting with faculty during office hours, and Interacting with faculty outside of class or office hours, with covariance of .7547. It could be that students had similar feelings about these kinds of interaction with faculty that influenced their decision to not answer these two questions. Perhaps they felt it was not important to interact with faculty in these ways, or they were not sure if they 'should', or did not know how to interpret the valence of these questions. Since these missing responses were not related to essential demographics, grades, or the dependent variable, it was decided that this did not inherently compromise the reliability of this study.

While all tests regarding patterns of missing data were explainable, the author decided to analyze missing data using Estimation Maximization (EM), and compare results to the original data. EM Analysis consisted of an iterative, two-step process (Harrington, 2009) and was calculated using SPSS 23. First, the estimation step used regression equations to replace missing values with predicted values. Second, maximum likelihood estimates were calculated as if the data were complete. The means for all values were compared to their EM counterparts. They were nearly identical, as were their standard deviations. As described in the body of this manuscript, EM revealed one variable of interest. With imputed data, interacting with Academic advisors and counselors became significant with a p value of .028. The unstandardized coefficients showed a negligible change with imputation from -.015 to -.014. With a Beta of -.018, it had a similar impact on students' academic self-confidence as Psychological Services. Table B.1 reflects the full regression model of the pooled data.

# Conclusions

Analysis of missing data indicated that demographic populations were well represented at all values, and missing data did not appear to present a pattern that threatened the power of this study. When data are MNAR, it is important to remember that even the most sophisticated methods of data substitution do not account for patterns of missingness. Data substitution methods have weaknesses (Paardekooper & Willemen, 2016) and should only be used when they solve specific problems. Considering the risks and tradeoffs, it was decided to run the regression model using paired listwise deletion with original data, and again using imputed data to compare results. Each of the steps taken to evaluate missing data offered different insights into the nature of the data, some even conflicting with others. Setting the p value is essentially arbitrary, and p values that come close can warrant additional scrutiny, such as that provided by this EM missing data analysis. This was a reminder that statistical methods are studies of variance, not truth, and a comprehensive understanding of the data is necessary to infer with the best judgement possible.

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# Table B.1

# Pooled Data Coefficients<sup>a</sup>

	Unsta	ndardized			Fraction	Relative	
-	Coet	fficients	_		Missing	Increase	Relative
Model	В	Std. Error	t	Sig.	Info.	Variance	Efficiency
1 (Constant)	1.348	.052	26.122	.000	.271	.331	.949
Self Rating_TFS: Academic ability	.478	.009	51.913	.000	.233	.275	.955
What was your average grade in high school?	.086	.005	17.103	.000	.082	.086	.984
Sex	113	.011	-9.884	.000	.102	.108	.980
SES=Income+Fathers	.011	.001	9.209	.000	.320	.413	.940
education+Mothers education_TFS							
Asian	127	.017	-7.317	.000	.136	.148	.974
Hispanic	108	.026	-4.221	.000	.183	.206	.965
Two or more race/ethnicities	032	.020	-1.650	.103	.246	.293	.953
American Indian	001	.193	007	.994	.001	.001	1.000
Other	007	.047	141	.888	.052	.053	.990
Black	005	.030	170	.866	.275	.337	.948
2 (Constant)	.616	.061	10.075	.000	.133	.144	.974
Self Rating_TFS: Academic ability	.443	.009	49.029	.000	.248	.297	.953
What was your average grade in high school?	.077	.005	15.157	.000	.134	.146	.974
Sex	130	.011	-11.914	.000	.067	.070	.987

SES=Income+Fathers	.010	.001	9.479	.000	.217	.252	.958
education+Mothers							
education_TFS							
Asian	062	.018	-3.547	.000	.158	.175	.969
Hispanic	092	.025	-3.710	.000	.176	.198	.966
Two or more race/ethnicities	014	.018	733	.465	.213	.246	.959
American Indian	042	.185	228	.820	.001	.001	1.000
Other	-9.806E-5	.045	002	.998	.059	.061	.988
Black	.003	.029	.096	.924	.281	.346	.947
Public 4 yr Colleges	.074	.024	3.116	.002	.146	.160	.972
Catholic 4 yr Colleges	.054	.019	2.888	.004	.062	.065	.988
Public 2 yr Colleges	.282	.108	2.609	.009	.003	.003	.999
Public Universities	.041	.022	1.865	.068	.300	.377	.943
Private Universities	.015	.018	.827	.409	.090	.094	.982
Nonsectarian 4 yr Colleges	.004	.016	.226	.822	.116	.125	.977
Private 2 yr Colleges	009	.076	113	.910	.002	.002	1.000
Interact: Faculty during office	017	.006	-2.904	.005	.254	.306	.952
hours							
Interact: Faculty outside of	.013	.005	2.366	.021	.257	.309	.951
class or office hours							
Interact: Academic	014	.006	-2.198	.028	.029	.029	.994
advisors/counselors							
Interact: Graduate	.003	.004	.775	.439	.098	.104	.981
students/teaching assistants							
Sought personal counseling	007	.008	815	.418	.265	.321	.950
Services: Student	024	.014	-1.715	.089	.203	.233	.961
psychological services							

Services: Career services	.038	.009	4.034	.000	.108	.116	.979
Services: Academic advising	.008	.010	.737	.462	.123	.133	.976
Act: Been a guest in a	.015	.012	1.254	.210	.010	.010	.998
professor's home							
Act: Asked a professor for	.024	.010	2.337	.021	.179	.201	.965
advice after class							
Act in College: Communicated	.026	.007	3.965	.000	.150	.165	.971
regularly with your professors							
(recoded)							
Act in Class: Received from	002	.010	212	.832	.111	.118	.978
your professor advice or							
guidance about your							
educational program							
Satisfaction: Student	010	.003	-3.324	.001	.067	.069	.987
psychological services							
Satisfaction: Academic	004	.005	918	.359	.018	.018	.997
advising							
Opinion: Faculty showed	043	.007	-6.105	.000	.037	.037	.993
concern about my progress							
Opinion: Faculty empower me	.017	.011	1.519	.130	.130	.141	.975
to learn here							
Opinion: At least one staff	019	.012	-1.508	.134	.176	.198	.966
member has taken an interest							
in my development							
Opinion: Faculty believe in my	.162	.013	12.368	.000	.171	.191	.967
potential to succeed							
academically							

-
Opinion: Staff encouraged me	049	.008	-5.887	.000	.045	.046	.991
activities							
Opinion: Staff recognize my achievements	.118	.011	10.857	.000	.157	.174	.970
Opinion: Faculty encouraged me to meet with them outside of class	031	.010	-3.148	.002	.202	.231	.961
Opinion: At least one faculty member has taken an interest	.019	.014	1.381	.173	.289	.360	.945
in my development Campus Satisfaction: Amount of contact with faculty	.067	.008	7.923	.000	.230	.270	.956

Dependent Variable: Self Rating2: Academic ability<sub>a</sub>

#### Appendix C

#### T Tests

A paired samples T test was conducted on the pre and post-test measures of academic self-confidence to discover whether the means of the two variables were equal (IBM Inc., 2013). Table C.3 indicated the mean Academic self-confidence score between the beginning and the end of the freshman year reduced by -.123. With standard errors of .007 and .006, and a p value of less than .001 (Table C.1), the reduction was statistically significant. Table C.2 also indicated that the pre- and post-test Academic self-confidence scores were moderately correlated, a relationship validated in the regression model reported in the findings section of this study.

#### Table C.1

					Std. Error
		Mean	Ν	Std. Deviation	Mean
Pair 1	Self Rating2: Academic ability	3.85	13623	.759	.007
	Self Rating_TFS: Academic ability	3.98	13623	.700	.006

Paired Samples T Test Statistics

#### Table C.2

#### Paired Samples Correlations

		Ν	Correlation	Sig.
Pair 1	Self Rating2: Academic ability & Self Rating_TFS: Academic ability	13623	.515	.000

Table C.3 described the difference between the pre- and post-freshman year means, as well as the confidence interval. The lower and upper differences were both negative, predicting with

95% confidence that the post-freshman year score would be less than the pre-freshman year score. This indicated that the freshman year was a challenging time for students' academic self-confidence.

# Table C.3Paired Samples Test

1 4110	a samples rest								
Paired Differences									
			Std.	Std.	95% C	I of the			
			Devia	Error	Diffe	erence			Sig. (2-
		Mean	-tion	Mean	Lower	Upper	t	df	tailed)
	Self Rating2:								
	Academic ability								
Pair	_	102	720	006	125	111	10.020	12600	000
1	Self	125	.720	.000	155	111	-19.930	13022	.000
	Rating_TFS:								
	Academic ability								

# Appendix C References

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# Appendix D

# Institution Types

Table D.1 provides information concerning the population of students at various types of institutions. It shows the frequency, percent, and cumulative percent.

# Table D.1

Туре	Frequency	Percent
Public	2558	16.1
Universities	2550	10.1
Private	2928	18 5
Universities	2720	10.5
Public 4yr	1201	76
Colleges	1201	7.0
Nonsectarian	1118	26.2
4yr Colleges	4140	20.2
Catholic 4yr	2250	14.2
Colleges	2239	14.2
Other		
Religious 4yr	2658	16.8
Colleges		
Public 2yr	22	n
Colleges	55	.2
Private 2yr	70	4
Colleges	/0	.4
Total	15855	100.0

Number of students at each type of participating institution

#### Appendix E

#### Analysis of Socio-economic Variables

For robust consideration of the effect of socio-economic influence on students' academic self-confidence, three variables were available, father's education, mother's education and parents' income. Possible education scores were 1 = "Junior high/Middle school," 2= "Some high school," 3= "High school graduate," 4= "Postsecondary school other than college," 5= "Some college," 6 = "College degree," 7 = "Some graduate school," and 8 = "Graduate degree." On average, most had a college degree or some college (5.8, where five is "some college" and 6 is "College degree"). The mode however for Mother's education was "6 = College degree" and for Father's was "8 = Graduate degree" (Figures E.1 and E.2).



[1= "Junior high/Middle school"; 2= "Some high school", 3= "High school graduate", 4= "Postsecondary school other than college", 5+ "Some college", 6 = "College degree", 7 = "Some graduate school", and 8 = "Graduate degree".]

Figure E.1 Mother's education

Figure E.2 Father's education

Income was reported as a response to the question, "What is your best estimate of your parents' income last year?" Answers were on a scale from 1 to 14 of grouped income brackets, with 1 representing an income of less than \$10,000 and 14 representing an income of \$250,000 or more (Table E.1). A total of 14,219 students responded to this question. The mean of 9.5, median of 10, and mode of 11 were all within one standard deviation of each other, indicating a central tendency of income between about \$67,000 and \$150,000.

Table E.1

Scale	Income
1	Less than \$10,000
2	\$10,000 to 14,999
3	\$15,000 to19,999
4	\$20,000 to 24,999
5	\$25,000 to 29,999
6	\$30,000 to 39,999
7	\$40,000 to 49,999
8	\$60,000 to 74,999
9	\$60,000 to 74,999
10	\$75,000 to 99,999
11	\$100,000 to 149,999
12	\$150,000 to 199,999
13	\$200,000 to 249,999
14	\$250,000 or more

"Income" had a more normal curve than parents' education (Table E.2 and Figures E.3 and E.4). Kurtosis is a measure of skewness with zero representing the theoretically perfect curve (Salkind, 2011), negative numbers indicate skewness to the left and positive numbers indicate skewness to the right. The histogram of "Income" has kurtosis of -.011 as compared to -.066 for "Mother's education" and -.468 for "Father's education". All three variables skewed to the left, with "Income" showing only slightly higher skewness at -.772 than "Mother's education" at -.68 and "Father's education" at -.65 (Table E.2).

#### Table E.2

Skewness and Kurtosis of Education, Income, and Combined SES

	Mother's Education	Father's Education	Parents' Income	Combined SES
Skewness	68	65	772	704
Kurtosis	066	468	011	047

A new variable representing this Socio-economic status factor (SES) was then created by adding "Father's education," "Mother's education," and "Parents' income." After cases with missing values were eliminated, this additive SES factor came from a sample of 13,902 students, compared to 15,439 for Mother's Education, 15,345 for Father's education, and 14,219 for Parents' income. Pearson's Correlation analysis was then conducted (Table E.3). With a p value set at .05, Table E.3 indicated the correlations among all four factors were statistically significant with p values of less than .01. Father's education and Mother's education showed a strong relationship to each other with a Pearson's score of .633. Income showed a moderate relationship to Father's Education at .444, as well as Mother's Education at .399.

#### Table E.3

#### SES Correlations

		Mother's Education_ TFS	Father's Education_ TFS	Estimate of parent income	SES= Inc+Fed+Med_ TFS
Mother's Education_TFS	Pearson Correlation	1	.613**	.399**	.755**
	Sig. (2-tailed) N	15439	.000 15299	.000 14026	.000 13902
Father's Education_TFS	Pearson Correlation	.613**	1	.444**	.793**
—	Sig. (2-tailed) N	.000		.000	.000
		15299	15345	13939	13902
What is your best estimate of	Pearson Correlation	.399**	.444**	1	.852**
your parents' income last	Sig. (2-tailed) N	.000	.000		.000
year?		14026	13939	14219	13902
SES=Inc+Fed+ Med_TES	Pearson Correlation	.755**	.793**	.852**	1
_	Sig. (2-tailed) N	.000 13902	.000 13902	.000 13902	13902

\*\*. Correlation is significant at the 0.01 level (2-tailed).

As an additive model, the combined SES factor retained a strong relationship to the components "Mother's education" and "Father's education," as well as a very strong correlation to "Parents' income." The histograms in Figures E.3 and E.4 illustrates SES has a similar curve to "Mother's" and "Father's education." Table E.2 compared skewness and kurtosis. The combined SES factor retained some skewing to the left at -.704, yet had a more normal bell curve than "Father's education" and "Income" alone.

The curve of Mother's Education (Figure E.1) is closer to the curve of Parents' Income (Figure E.3) than Father's Education (Figure E.2), as well as being closer to the curve of the SES

factor (Figure E.4). This analysis validates that "Mother's education" is very close to SES (Altschul, 2012; Heckman, 2008; Wamani, Tylleskar, Astrom, Tumwine, & Peterson, 2004), and may make an adequate proxy if no further information was available.



The author has decided for this study to use the combined SES factor because it is more descriptive.

## Appendix E References

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#### Appendix F

#### Factor Analysis: Frequency Seeking out Potential Mentors

This manuscript examines the effects of how frequently students engaged with potential mentors. Factor analysis was conducted on thirteen different measures of frequency. This was done to confirm the uniqueness of each variable before inclusion in the regression model. The thirteen variables were grouped into three categories, frequency of seeking out potential mentors, frequency of interacting with potential mentors, and frequency of engaging with student services where potential mentors may be found.

**Frequency of seeking out potential mentors**. Questions that addressed the students' initiative in seeking out potential mentors were rated on a three point scale with one meaning "Not at all" and three meaning "Frequently." These included having (a) "Asked a professor for advice after class," (b) "Received from your professor advice or guidance about your educational program," (c) "Communicated regularly with your professors," (d) "Been a guest in a professor's home," (e) "Sought personal counseling," and (f) "Worked on a professor's research project."

Of the six variables in Table F.1 below, two factors loaded separately. The variable "Worked on a professor's research project" had generated a second factor with a low loading of .350. Good to excellent statistical relationships were defined as having factor loadings between .55 and .8 (Harrington, 2009; Salkind, 2011). It would be extremely rare to work on research with a professor during the freshman year of college, so this variable was eliminated in the interest of parsimony.

#### Table F.1

# Factor Analysis frequency of seeking mentorship, round 1

	Fac	tor
	1	2
Act: Asked a professor for advice after class	.639	051
Act in Class: Received from your professor advice or guidance about	.606	.049
your educational program		,
Act in College: Communicated regularly with your professors	.554	209
Act: Been a guest in a professor's home	.242	.173
Act in College: Sought personal counseling	.173	.068
Act in Class: Worked on a professor's research project	.186	.350
Extraction Method: Principal Axis Factoring.		

a. 2 factors extracted. 18 iterations required.

In the second round, shown in Table F.2, one factor loaded with "Asked a professor for advice after class" having loaded the highest at .654.

#### Table F.2

T	4 7 .	C	C 1.	, 1·	10
Factor A	Analysis	treauency	οτ seeking	mentorsnin	rouna z
1 00001 1	menyons.	<i>fiequency</i>	of secting	memor snip,	

	Factor
	1
Act: Asked a professor for advice after class	.654
Act in Class: Received from your professor advice or	500
guidance about your educational program	.399
Act in College: Communicated regularly with your professors	.542
Act: Been a guest in a professor's home	.226
Act in College: Sought personal counseling	.170
Extraction Method: Principal Axis Factoring.	

a. 1 factors extracted. 9 iterations required.

Cronbach's alpha is a measure of internal consistency, or how closely a set of items are related as a group (Institute for Digital Research UCLA, 2016). Table F.3 charted Cronbach's alpha for each of these variables, with .563 for Sought personal counseling. This was too low, as

.7 is considered acceptable for internal reliability in most social sciences (Institute for Digital

Research UCLA, 2016).

#### Table F.3

## Cronbach's Alpha Frequency of seeking mentorship

	Scale Mean	Scale	Corrected	Cronbach's
	if Item	Variance if	Item-Total	Alpha if Item
	Deleted	Item Deleted	Correlation	Deleted
Act in College: Sought personal				
counseling	7.42	3.228	.134	.563
Act: Been a guest in a professor's home	7.66	3.820	.174	.511
Act in College: Communicated regularly with your professors (recoded variable)	6.51	2.387	.349	.412
Act in Class: Received from your professor advice or guidance about your educational program	6.96	2.989	.404	.383
Act: Asked a professor for advice after class	6.83	2.994	.428	.373

Based on these findings, the author decided these variables should not be grouped as a factor, but entered independently into the regression model.

Frequency interacting with potential mentors. On a scale of one to six with one meaning "Never" and six meaning "Daily," these questions addressed the frequency of interaction with: (a) "Faculty outside of class or office hours," (b) "Faculty during office hours," (c) "Academic advisors/counselors," and (d) "Graduate students/teaching assistants." Table F.4 and Table F.5 below show similar results as in the analysis of Frequency of seeking out potential mentors, meaning that factor loadings and Cronbach's alpha were low and justified entering each variable separately in the regression model.

#### Table F.4

|--|

	Factor
	1
Interact: Faculty outside of class or office	605
hours	.095
Interact: Faculty during office hours	.692
Interact: Academic advisors/counselors	.529
Interact: Graduate students/teaching assistants	.262
Extraction Mathed, Dringing Aris Eastering	

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 8 iterations required.

## Table F.5

	Scale Mean	Scale	Corrected	Cronbach's
	if Item	Variance if	Item-Total	Alpha if Item
	Deleted	Item Deleted	Correlation	Deleted
Interact: Faculty during office hours	7.40	6.866	.470	.443
Interact: Faculty outside of	7.76	6.394	.465	.438
class or office hours				
Interact: Academic advisors/counselors	7.84	8.155	.403	.513
Interact: Graduate students/teaching assistants	7.93	7.152	.217	.668

Total Statistics, Cronbach's alpha frequency of interaction with potential mentors

#### Frequency engaging with student services where potential mentors may be found.

These questions included (a) Career Services, (b) Academic advising, and (c) Student psychological services. These variables loaded as one factor with low loadings. The low Cronbach's alpha justified including these variables separately in the regression model.

## Table F.6

#### Frequency engaging with services where potential mentors may be found

	Factor
	1
Services: Career services	.655
Services: Academic advising	.373
Services: Student psychological services	.278

Extraction Method: Principal Axis Factoring.

a. Attempted to extract 1 factors. More than 25 iterations

required. (Convergence=.002). Extraction was terminated.

# Table F.7

Cronbach's alpha: Frequency of engaging with services where potential mentors may be found

	Scale Mean	Scale	Corrected	Cronbach's
	if Item	Variance if	Item-Total	Alpha if Item
	Deleted	Item Deleted	Correlation	Deleted
Services: Student psychological services	3.48	.846	.180	.395
Services: Academic advising	2.66	.735	.229	.310
Services: Career services	3.29	.672	.292	.180

In summary, the loadings and alphas were too low for all three types of frequency variables, and so all frequency variables were entered individually into the regression model to evaluate their influence on students' Academic self-confidence.

# Appendix F References

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#### Appendix G

Factor Analysis: Satisfaction with Potential Mentorship Experiences

This manuscript examined the effects of satisfaction with potential mentorship experiences. Survey questions pertaining to satisfaction fell into two groups, (a) Satisfaction that potential mentors are interested in me and empower me, and (b) Satisfaction with campus and student services where potential mentors may be found. Each group of variables represented different organizational levels of mentorship opportunities, the former being interpersonal and the latter being organizational. The questions used different scales, and so were analyzed separately. Unlike the frequency variables, some of the satisfaction questions did load with high enough factor loading scores to be considered one factor, as explained in the following subsections.

#### Satisfaction that Potential Mentors are Interested in Me and Empower Me

On a four point scale with one meaning "Strongly disagree" and four meaning "Strongly agree," these questions asked for students' opinions on whether, (a) At least one faculty member has taken an interest in my development, (b) Faculty believe in my potential to succeed academically, (c) At least one staff member has taken an interest in my development, (d) Staff recognize my achievements, (e) Faculty empower me to learn here, (f) Staff encouraged me to get involved in campus activities, (g) Staff recognize my achievements, (h) Faculty encouraged me to meet with them outside of class, and (i) Faculty showed concern about my progress.

The first round of factor analysis (Table G.1) showed all of these opinions loading as one factor, with the highest score of .798 belonging to faculty believing in the student's potential to succeed academically. The lowest loading of .453 belonged to faculty showed concern about the students' progress.

## Table G.1

Satisfaction that potential Mentors empower me: round 1

	Factor
	1
Opinion: Faculty believe in my potential to succeed	700
academically	./98
Opinion: At least one faculty member has taken an interest in	707
my development	.191
Opinion: At least one staff member has taken an interest in my	771
development	.//1
Opinion: Staff recognize my achievements	.704
Opinion: Faculty empower me to learn here	.664
Opinion: Staff encouraged me to get involved in campus	570
activities	.570
Opinion: Faculty encouraged me to meet with them outside of	563
class	.303
Opinion: Faculty showed concern about my progress	.453
Extraction Method: Principal Axis Factoring.	

a. 1 factors extracted. 5 iterations required.

This last question, Faculty showed concern about my progress, became interesting after calculating the Cronbach's alpha (Table G.2), because removing it *increased* the scale reliability from .858 to .865. It appeared that students experienced this contact with faculty differently than the other variables, perhaps not as a completely supportive encounter. This was addressed further in the discussion of findings and implications for practice.

# Table G.2

		Scale	Corrected	Cronbach's
Cronbach's alpha on 8	Scale Mean if	Variance if	Item-Total	Alpha if Item
items: .858	Item Deleted	Item Deleted	Correlation	Deleted
Opinion: Faculty				
showed concern about	21.40	12.222	.424	.865
my progress				
Opinion: Faculty				
empower me to learn	21.12	12.211	.615	.840
here				
Opinion: At least one				
staff member has taken	21.00	11 345	695	830
an interest in my	21.00	11.545	.075	.050
development				
Opinion: Faculty				
believe in my potential	21.03	11 727	726	828
to succeed	21.05	11.727	.720	.020
academically				
Opinion: Staff				
encouraged me to get	21.33	12.033	527	850
involved in campus	21.00	12.000		1000
activities				
Opinion: Staff				
recognize my	21.32	11.803	.649	.836
achievements				
Opinion: Faculty				
encouraged me to meet	21.20	12.237	.527	.850
with them outside of				
class				
Opinion: At least one				
faculty member has	21.11	11.361	.720	.827
taken an interest in my				
development				

Cronbach's alpha: Satisfaction that potential Mentors empower me: round 1

To increase the scale reliability, the variable about faculty showing concern for the students' progress was removed. A second round of factor analysis was conducted on the

remaining seven variables, which loaded highly onto one factor with loading scores between .802 and .558 respectively, as detailed in Table G.3.

# Table G.3

Factor Loadings of Satisfaction that mentors empower me: round 2		
Ро	otential mentors are interested in me and ei	mpower me
At least one faculty member has tak	ken .802	
an interest in my development		
Faculty believe in my potential to	.799	
succeed academically		
At least one staff member has taken	n .772	
an interest in my development		
Staff recognize my achievements	.705	
Faculty empower me to learn here	.658	
Staff encourage me to get involved	.572	
in campus activities		
Faculty encourage me to meet with	1.558	
them outside of class		

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The Cronbach's alpha on these seven items was .865, as shown in Table G.4 below. This is considered a reliable score (Salkind, 2011).

## Table G.4

	Scale Mean	Scale Verience if	Corrected	Cronbach's
Crambash's alpha 965	II Itelli Deleted	Variance II	Completion	Deleted
	Deleted	Item Deleted	Correlation	Deleted
Opinion: Faculty showed	18.38	9.574	.416	.862
concern about my progress				
Opinion: Faculty empower	18 10	9 582	608	830
me to learn here	10.10	2.502	.000	.050
Opinion: At least one staff				
member has taken an interest	17.98	8.768	.701	.815
in my development				
Opinion: Faculty believe in				
my potential to succeed	18.01	9.121	.730	.813
academically				
Opinion: Staff encouraged				
me to get involved in campus	18.31	9.417	.519	.843
activities				
Opinion: Staff recognize my	19.20	0.224	(29	925
achievements	18.50	9.234	.038	.823
Opinion: At least one faculty				
member has taken an interest	18.09	8.815	.718	.812
in my development				

Cronbach's alpha: Satisfaction that mentors empower me: round 2 Item-Total Statistics

Four of these satisfaction variables pertained to faculty and three of them to staff. In the process of exploring the data, faculty, and staff questions were also analyzed separately. The factor loadings and alphas for faculty and staff were higher together than when they were analyzed separately. This speaks to the possibility that students are including faculty in their answer to questions regarding staff.

# Satisfaction with Campus and Student Services where Potential Mentors May be Found

On a six point scale with one meaning "can't rate/no experience" and six meaning "Very satisfied," these questions inquired of students what degree of satisfaction they felt regarding (a)

Student psychological services, (b) Career services, and (c) Academic advising. Table G.5 summarized low factor loadings.

#### Table G.5

Satisfaction with campus and student services	where potential mentors may be found			
Cronbach's alpha: .269. Due to low loadings, each was entered into				
the regression model as its own factor.				
Factor 2: Satisfaction: Academic advising	.674			
Factor 3: Campus Satisfaction: Amount of				
contact with faculty	.433			
Factor 4: Satisfaction: Student psychological				
Services	.153			

With these weak relationships, these variables would be used individually in the regression analysis.

To summarize this stage of factor analysis, the only independent variables that loaded together were those pertaining to Satisfaction that potential mentors are interested in me and empower me. Behaviors involving faculty and staff loaded higher together than they did separately, possibly indicating that students see faculty as also being part of the staff. Or, it could also mean students have more than one mentoring relationship with faculty and staff members. Because of the ambiguity of these possible interpretations, the author decided not to combine these variables for this study, and to run the regression analysis using all of the individual variables. This was the best way to connect actual mentorship experiences and attitudes with academic self-confidence.

# Appendix G References

Salkind, N. J. (2011). *Statistics for people who (think they) hate statistics* (4th ed.). Thousand Oaks, CA: Sage.