

THE USE OF A VALUES AFFIRMING INTERVENTION: DOES IT IMPACT MATH
SCORES AND SEMESTER GRADE POINT AVERAGES IN A
STUDENT SUPPORT SERVICES POPULATION

by

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ABSTRACT

The Use of a Values Affirming Intervention to Improve Student Math Scores and
Semester Grade Point Averages in Student Support Services

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College students who are first generation (neither parent has completed a 4-year college degree), from a low socioeconomic status family, or who have a disability tend to have weaker academic and social integration within higher education. This leads to a lessened likelihood of college degree attainment. Overall, college graduates tend to be healthier, wealthy, and civically engaged compared to individuals who do not complete college. Thus, understanding how to promote college persistence and degree completion is important. Researchers have evaluated whether a values-affirming writing intervention provided to first generation college students would lead to higher levels of academic self-efficacy and better academic performance (as measured by grades). This study expanded upon those previous studies to look specifically at whether a values-affirming writing intervention provided to students in a federally funded college opportunity program would affect academic self-efficacy, semester math grades, and overall semester

academic performance (as measured by GPA). In this study, when students wrote about their personal values their academic self-efficacy increased over the course semester, $t(14) = -2.858, p = .013$. However, there was no significant change in math class performance, $t(20) = -1.094, p = .287$, or semester grades, $t(22) = -0.260, p = .797$ when compared to a sample of historical controls. This study suggests more research on values affirming writing interventions within a federally funded college opportunity program may be beneficial in identifying methods of improving retention rates and college degree attainment for certain populations of at-risk students.

(73 pages)

PUBLIC ABSTRACT

The Use of a Values Affirming Intervention to Improve Student Math Scores and Semester Grade Point Averages in Student Support Services

Amy L. DeBruler

College students who are from low income families, have disabilities, or are the first in their family to attend college are more likely to struggle socially and academically in a college setting. Promoting college graduation within these disadvantaged populations is critical for increased life wellness. Previous researchers studied to see if when students wrote about their personal beliefs if it would lead to higher levels of academic confidence and better academic performance (as measured by grades). This study expanded upon those previous studies to look specifically at whether a values-affirming writing intervention provided to at risk students in a federally funded college opportunity program would affect academic confidence, semester math grades, and overall semester academic performance (as measured by GPA). While there was no impact on semester math grades or overall semester academic performance, the values-affirming writing intervention did benefit students' academic confidence. This study suggests more research on writing about personal beliefs within a federally funded college opportunity program may be beneficial in identifying methods of improving retention rates and college degree attainment for certain populations of at-risk students. A values-affirming intervention for at-risk students may be one protective factor universities can implement to help these students succeed.

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CHAPTER I

PROBLEM STATEMENT

Higher levels of education are associated with healthier, wealthier, and more civically engaged students as compared to individuals who do not receive a college education (Hout, 2012; Kingston, Hubbard, Lapp, Schroeder, & Wilson, 2003; Ma, Pender, & Welch, 2016). Higher levels of education are also associated with a reduction in intolerance and prejudice as well as increased support for civil liberties (Kingston et al., 2003). The benefits of a college education make understanding college retention and student perseverance important research topics to better understand ways to encourage student success.

Tinto (1975) developed a theoretical model of higher-education persistence explaining the main causes of college dropout. Tinto stated that an individual's background such as "past experiences" and "individual characteristics" (p. 96) predict how that individual will assimilate into the academic and social systems of college which inevitably predicts college continuance. This theory has been tested and confirmed with various populations such as first-generation college students (Longwell-Grice & Longwell-Grice, 2007) and nontraditional students (Ashar & Skenes, 1993).

Students with educational or economic disadvantages are less likely to continue their education as compared to students whose parents have more education or who are not economically disadvantaged (Chaney, Muraskin, Cahalan, & Goodwin, 1998). This relationship between college degree attainment and socioeconomic status (SES) remains. For example, in an educational longitudinal study completed in 2014, researchers found

the amount of financially stable individuals (in the top-quartile) completing a bachelor's degree or higher was 60% (Lauff & Ingels, 2014). In comparison, only 14% of financially disadvantaged students (in the bottom quartile) completed a bachelor's degree (Lauff & Ingels, 2014).

Economically disadvantaged students tend to have weaker academic and social integration within the institution which Tinto (1975) suggests can lead to drop-out behaviors. A federally funded college opportunity program, known as TRIO, for students from disadvantaged backgrounds was a result of President Lyndon B. Johnson's War on Poverty (Council for Opportunity in Education, n.d.). The program was named for the trio of federally funded programs that were first implemented: Student Support Services (SSS), Upward Bound, and Talent Search. SSS have been put in place in many higher education institutions to support students from disadvantaged backgrounds in their quest to obtain a college degree. In order to be eligible for these services students must meet at least one of the three following criteria: low income, first-generation college student, or physically disabled.

Students from disadvantaged backgrounds are often less prepared to enter and complete college than other students. Some variables that may contribute to college readiness include classroom experience, education enrichment programs, and quality of instruction. Although many classes are taught in today's schools, there has been an increased focus on math and science due to the high demand of science, technology, engineering, and math (STEM) professions. Low income and ethnic minority students often complete lower level math courses in high school compared to their middle income

or White peers (Byun, Irvin, & Bell, 2015; Geist & Geist, 2009; Riegle-Crumb & Grodsky, 2010; Wimberly & Noeth, 2005), which underprepares them for college entrance exams (Adelman, 2006). First-generation students in particular are often underprepared for college due to limited access to supplemental academic enrichment (Thayer, 2000). This lack of preparation results in lower critical thinking levels, lower SAT scores, and lower high school GPAs than continuing-generation students (Thayer, 2000). Also, first-generation students are more likely to not have well-developed time management or budget management skills (Thayer, 2000). This lack of adequate preparation is often associated with increased college dropout rates.

While in some states the requirements for math in high school have changed so that all students must take math every year, that does not guarantee math readiness for college. Many studies have shown that math is the most common subject in which students are not ready for college-level coursework (Attewell, Lavin, Domina, & Levey, 2006; Fike & Fike, 2008; Freer-Weiss, 2004; Hagedorn, Maxwell, & Hampton, 2007; Provasnik & Planty, 2008). At some universities students who do not meet minimum math qualifications for college acceptance have two paths they can take towards obtaining higher education. One option is for students to go to a community college and take remedial math courses until they reach minimum college math competency. The other option is that students can sometimes be accepted into college conditionally with the expectation of passing noncredit earning prerequisite math classes, before registering for required math courses.

Due to the various benefits of higher education, the challenges faced by students

from disadvantaged backgrounds in college integration, and the lack of college readiness in these students any interventions that can promote academic success are critical. One characteristic that has been linked to academic success is self-efficacy (Mattern & Shaw, 2010). Self-efficacy was first defined as “beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1977, p. 3). The construct of self-efficacy hinges on an individual's belief in their skills. Academic self-efficacy is then an individual's belief in their ability to succeed academically. Academic self-efficacy has been found to be strong predictor of academic success in various studies (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Lent, Brown, & Larkin, 1986; Multon, Brown, & Lent, 1991; Pajares & Graham, 1999; Pajares & Johnson, 1996; Pajares & Miller, 1994; Schunk, 1981, 1982, 1983, 1984; Schunk & Cox, 1986; Schunk & Hanson, 1985, 1989; Schunk & Swartz, 1993). First-generation college students worry more about belonging in college and, on average receive lower grades than continuing generation college students (Mattern & Shaw, 2010). These lower grades can result in decreased levels of self-efficacy. Students' current levels of self-efficacy are typically a result of past experiences (Mattern & Shaw, 2010). For example, if a student has been successful in a particular subject in the past then the student will most likely have a higher level of self-efficacy compared to a student who has not been successful in that subject. However, despite a student's past level of academic success self-efficacy can be increased through the use of various techniques (Schunk & Meece, 2006).

Educators can use many techniques in order to improve self-efficacy and promote

college retention. One way teachers can increase the self-efficacy of their students is to explain how what they will learn relates that what they already know. Students are more likely to feel more confident in their ability to master new information if they feel confident about the foundational knowledge (Schunk & Meece, 2006). Another technique teachers can implement is the use of peer models. When struggling students see a similarly-achieving student being successful with a new concept that struggling student is more likely to work to achieve the new concept (Schunk & Meece, 2006).

Self-efficacy can be negatively impacted by certain factors such as identity threat. An individual's identity can be threatened when their "self-esteem, self-efficacy, continuity, distinctiveness, belonging, and meaning" (Batory, 2015, p. 166) are questioned. In order to address the problem of identity threat in college, researchers created a values affirmation writing intervention designed to promote self-efficacy in a general sample of undergraduate students (Steele & Liu, 1983). In this intervention students wrote about their most important values. Studies have indicated this intervention has helped students cope with identity threat (Fein & Spencer, 1997; Sherman, Nelson, & Steele, 2000). In one study researchers found that individuals were less likely to negatively evaluate a member of a stereotyped group if their personal self-image had been elevated through a self-affirmation intervention (Fein & Spencer, 1997). In another study researchers found that when an individual's self-image is elevated through an intervention they were more likely to accept and behave in ways that were beneficial to their health than individuals who did not receive a self-image affirmation (Sherman et al., 2000). For example, women whose self-image was promoted before reading about a

correlation between caffeine consumption and breast cancer were more likely to accept this information as true and decrease their caffeine consumption. In contrast, women who did not receive the self-image intervention were less likely to accept the information and were also less likely to reduce their caffeine consumption (Sherman et al., 2000).

Specific to college students, researchers found that by implementing a values-affirming intervention, first-generation students earned higher grades and felt less worried about whether or not they belonged in college (Harackiewicz et al., 2014). A follow-up study found that when first-generation students were encouraged to write more about their independent values in a values-affirming intervention the students who used more independent words, measured using Linguistic Inquiry and Word Count, had improved short and long-term academic performance (Tibbetts et al., 2016). Researchers also found that when first-generation students wrote about chosen independent values, from a values list, in a values-affirming intervention these students had better math test scores than the first-generation students who wrote about interdependent values. These values were chosen from the original Harackiewicz (2014) study by identifying the values most strongly correlated with independent themes. The improved math test scores suggest that promoting independent values in a writing values affirmation intervention may be especially beneficial in increasing math scores in first-generation college students (Tibbetts et al., 2016).

The individual and societal benefits of higher education encourage many students to apply for college. However, since students from disadvantaged backgrounds have a more difficult time integrating academically and socially into the college community,

they are more likely to drop-out. The study by Tibbetts et al. (2016) found the positive academic performance effects of the values affirmation writing intervention in the study by Harackiewicz et al. (2014) to last 3 years after the initial intervention. Tibbetts et al. also found that first-generation students who wrote more about their independent values instead of their interdependent values in the study by Harackiewicz et al. obtained high grades in the semester the values affirming intervention was implemented as well as following semesters. Finally, researchers also found that when first-generation students were encouraged to write more about their independence, their performance on a math test improved. No studies were located regarding how an independent value affirming writing intervention could benefit students participating in an SSS TRIO Program.

This pilot study aimed to determine if a values-affirming writing intervention would lead to improved math scores and semester GPAs with Student Support Service students. The following were the specific research questions and hypotheses for this study.

1. Will the completion of a values affirming intervention in a Student Support Services math course improve semester math course grades?
 - a. It was hypothesized that Student Support Service students who complete a values-affirming writing intervention would receive better grades in their semester math course than historical Student Support Services semester math grades.
2. Will Student Support Service students assigned to complete a values-affirming writing intervention have a higher semester GPA than students who did not participate in the invention?
 - a. It was hypothesized that Student Support Service students assigned to complete a values-affirming writing intervention would have a higher semester GPA than historical Student Support Services semester GPAs.

3. Will the values affirming writing intervention improve students' academic self-efficacy?
 - a. It was hypothesized that the independent values affirming writing intervention would improve students' academic self-efficacy

CHAPTER II

LITERATURE REVIEW

Higher education is associated with a broad variety of benefits for students, and also boasts multiple benefits for society. Students who receive a higher education are healthier, wealthier, and are more accepting of diversity compared to students who did not receive a higher education. Higher education also benefits society because students who engage in higher levels of education are more likely to be civically engaged, are less likely to be unemployed or living in poverty, and are less likely to be incarcerated (K. Baum & Payea, 2005; Ma et al., 2016). Despite the numerous benefits of obtaining a higher education factors such as SES and degree of parental education can affect which students apply for higher education programs as well as attrition from higher education (Ma et al., 2016). Higher levels of self-efficacy have shown to improve academic performance as well as improve retention rates (Mattern & Shaw, 2010).

Benefits of Higher Education

Researchers found that compared to less educated individuals, people with higher levels of education felt more in control of their life, their health, and had better social support networks (Ross & Wu, 1995). Individuals who have higher levels of education are also more likely to hold desirable jobs (Hout, 2012) and are less likely to be incarcerated than individuals with lower levels of education (K. Baum & Payea, 2005). Higher education attainment has also been related to the reduction of intolerance and prejudice while increasing support for civil liberties (Kingston et al., 2003). The

numerous benefits of higher education are expounded upon below.

Education is positively associated with health (Hout 2012; Ma et al., 2016; Ross & Wu, 1995). In one study evaluating the link between education and health, two groups of participants were analyzed (Ross & Wu, 1995). The first group consisted of 2,031 respondents between the ages of 18-90. The second sample group consisted of 3,025 respondents ranging in age from 20-64. All participants were individuals living in U.S. households. The researchers found that compared to less educated individuals, people with higher levels of education felt more in control of their life, their health, and had better social support networks. The study also found that more educated individuals were less likely to smoke, more likely to exercise, and more likely to drink in moderation compared to less educated people (Ross & Wu, 1995).

In a report for The College Board, unemployment rates have been shown to decrease as education levels increase (Ma et al., 2016). This trend applies to all racial and ethnic groups, but the difference is greatest for Black individuals (Ma et al., 2016). Specifically, the 4.0% unemployment rate for Black individuals with a bachelor's degree is less than half of the 9.7% unemployment rate for Black individuals with a high-school diploma. The 2.4% unemployment rate for White individuals with a bachelor's degree is also less than half of the 4.6% unemployment rate for White individuals with a high-school diploma. Increased levels of education also reduce the rate of poverty. Specifically, the rate of poverty for college graduates is roughly one third the rate of poverty for high-school degree recipients (Ma et al., 2016). Additionally, according to the U.S. Bureau of Labor Statistics (2018) students with a college degree are almost twice as

likely to be employed as compared to students with a high school diploma or less. By reducing unemployment rates and poverty higher education benefits society by decreasing the demand on welfare and stimulating the economy with more purchases made by employed individuals.

As college graduates are more likely to be employed, they are also more financially stable than individuals with lower levels of education. For example, during the recession between 2007-2009 people with less than a high school diploma were more than four times as likely to be unemployed than those with a college degree. People with higher education levels also had more desirable jobs than those with lower levels of education (Hout, 2012). Finally, individuals who have earned a bachelor's degree earn 65% more in their life compared to individuals who have only earned a high school diploma (Ma et al., 2016).

Increased education is also associated with reduction in incarceration rates (Lochner & Moretti, 2004; Western & Pettit, 2010). Individuals with some college experience are one quarter as likely to be incarcerated compared to high-school graduates (K. Baum & Payea, 2005). Incarceration rates are highest in individuals who have not completed a high-school degree at 1.9% in 1997 (K. Baum & Payea, 2005). In comparison, individuals who have graduated with a bachelor's degree were incarcerated at a rate of 0.1% in 1997 (K. Baum & Payea, 2005). In 1990, the number of people incarcerated in the U.S. was roughly 700,000; however, today that number exceeds 1.3 million people (Sentencing Project, 2015). This increasing trend of mass incarceration puts a strain financially on the U.S. In 1990, the U.S. spent \$16.9 billion on incarcerating

people; however, by 2013 that number had risen to \$51.9 billion (Sentencing Project, 2015). By promoting educational attainment to all individuals residing in the U.S., society benefits from lessening the rate of incarcerated individuals and therefore decreasing the financial demand on the U.S. and tax payers.

One benefit of higher levels of education is the tendency to have increased levels of tolerance (Bobo & Licari, 1989; Kingston et al., 2003). The General Social Survey has been given to individuals in the U.S. since 1972, and has questions about demographics, civil liberties, psychological well-being, stress and traumatic events, etc. (NORC at The University of Chicago, 2013). A study using data from the 1984 General Social Survey evaluated what effects education may have on tolerance (Bobo & Licari, 1989). In this study tolerance was defined as “any expression of support for any concrete use of a civil liberty” (Bobo & Licari, 1989, p. 290). This survey used a multistage sample of English-speaking adults in the U.S. to recruit a sample of 1,473 participants. The researchers found education was strongly related to tolerance. For example, if two individuals explicitly express the same negative views towards a specific political group, the individual with higher educational attainment will be more tolerant of that group than the individual with a lower level of education (Bobo & Licari, 1989).

Researchers studying the effects education on support for civil liberties found individuals who were more educated were more supportive of civil liberties compared to less educated individuals, indicating an increased level of tolerance (Wright & Hyman, 1979). This study used a sample of 600 individuals from the U.S. with varied education backgrounds. No specific information was given on educational achievement (Wright &

Hyman, 1979).

A more recent study analyzing the effects of education and views of civil liberties was conducted by using a secondary analysis of aggregated data from the General Social Surveys from 1991 to 1998 conducted by the National Opinion Research Center (Kingston et al., 2003). This survey used a multistage sample of noninstitutionalized, English speaking adults in the U.S. Researchers found that more educated individuals were more supportive of civil liberties. Although this study was not able to explain why education is positively related to support of civil liberties, the authors suggested that education may generate socialization, thus people who are more educated may better understand the importance of valuing and protecting civil liberties. Another benefit of higher education to the community is that individuals with higher levels of education participate in politics more actively by registering to vote, gathering more knowledge on political candidates and bills, and voting more regularly than those with less education (Ma et al., 2016; Milligan, Moretti, & Oreopoulos, 2003).

Tinto's Theory of Higher Education

Due to the various benefits of higher education, understanding what variables make individuals continue in college is important. In 1975, Tinto created a theoretical model to explain why students left higher education. This model was developed using Durkheim's Theory of Suicide. Durkheim (1961) theorized individuals who failed to integrate into society were more likely to commit suicide. Tinto relates the college community to society in Durkheim's model and thus drop-out to suicide. By using

Durkheim's theory Tinto (1975) developed a model that could describe specific conditions that result in an individual dropping out from college. Tinto argued dropout can be viewed as a "longitudinal process of interactions between the individual and the academic and social systems of the college during which a person's experiences in those systems (as measured by his normative and structural integration) continually modify his goal and institutional commitments in ways which lead to persistence and/or to varying forms of dropout" (p. 94). Tinto's model (Figure 1) explains how each individual's unique attributes combine with social and academic experiences resulting in college attrition or dropout.

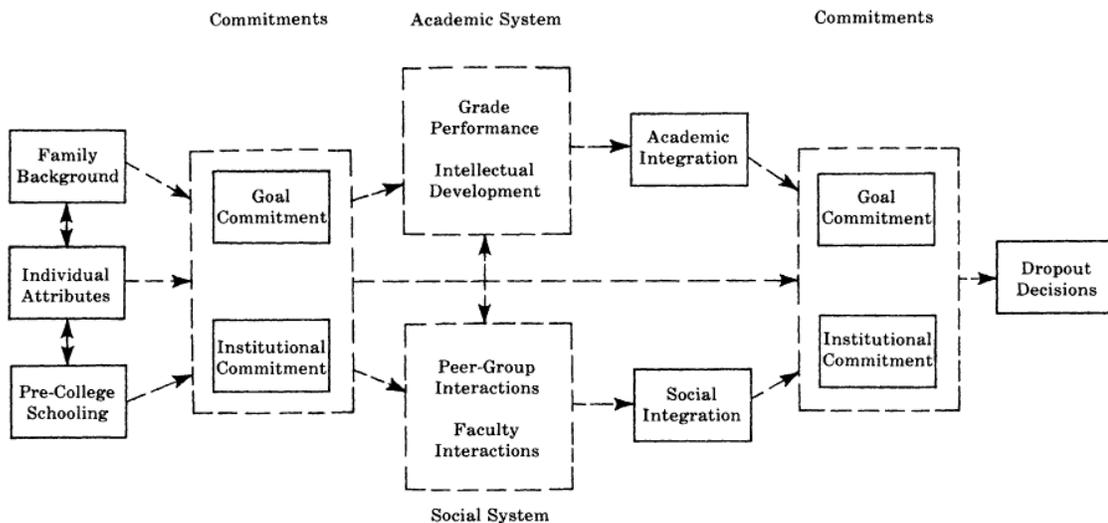


Figure 1. Tinto's model (Tinto, 1975, p. 95).

This model encompasses background attributes (i.e., social class and past education experience), individual attributes (i.e., sex, ability, and ethnicity), and motivational attributes of an individual (i.e., career goals, academic goals, and motivation for success). Tinto (1975) suggested that the way in which the individual interacts with

the academic and social systems within the higher education environment predicts that individual's level of academic persistence. While the individual's background attributes may contribute to his or her eagerness to integrate into the college environment, it is also important that universities work to meet students at their academic level and provide resources to support students from a variety of backgrounds. Tinto's theory has been tested on multiple populations such as nontraditional students as well as first-generation students.

One study evaluated whether Tinto's theory of higher education could be applied to non-traditional students (Ashar & Skenes, 1993). The researchers were especially interested in this population since Tinto's theory suggests integration within the social system is a critical component of attrition and nontraditional students typically engage in social systems outside of the educational environment. To test this theory researchers used a convenience sampling method to recruit 25 intact adult learner groups in a university in a major metropolitan area (Ashar & Skenes, 1993). No other demographic information was included about the sample. These intact adult learner groups were small groups of students that were already in class together. Students were assessed on their level of academic commitment, their social interactions, and their need for higher education to obtain a desired profession. The researchers found that the classrooms that were better socially integrated (meaning the students were more similar based on age, the number of people they supervised at work, and current salary) and had fewer students, had higher retention rates than the classes that were less socially integrated and had more students (Ashar & Skenes, 1993).

Another study considered how student demographic variables affected perceptions of school climate (Parris, Neves, & La Salle, 2018). Student's positive perceptions of climate are linked to increased academic achievement and better social and emotional well-being (Parris et al., 2018). In this study, researchers recruited 309,327 middle school students from across the Southeastern U.S. Participants identified as 34% Black, 14% Latinx, 41% White, 5% Asian, and 6% as unspecified other. In this study, White students had higher perceptions of school climate than their Black or Other Ethnicity peers did. Researchers also found that Asian and Latinx students reported more positive school perceptions than students from the other ethnic groups (Parris et al., 2018).

Tinto (1990) reported that students' interactions with faculty, staff, and peers predict student persistence. In another study Tinto's theories of college retention were tested on first-generation college students. Specifically, the study considered the first-generation students' perceptions of faculty support (Longwell-Grice & Longwell-Grice, 2007). To ensure confounding variables were minimized this case study only used four, White, male, working class, first-generation, first-year students. The researchers were most interested in perceptions of faculty support. The researchers found that participants expressed concern about communicating with faculty and perceived faculty approval as essential. Because students from disadvantaged backgrounds struggle more than other students to integrate into the college community (Chaney et al., 1998) first-generation students may need additional assistance with talking to faculty members and encouragement from faculty in engaging in all aspects of college (Clewell & Ficklen,

1986; Courtland, 1991; Edmonds & McCurdy, 1988). One major limitation to this study is the sample size. More research should be done to determine how perceived faculty support effects student persistence using a larger and more diverse and representative sample of participants.

Underrepresented Populations in Higher Education

Considering the benefits of attaining higher levels of education, it is important to understand who is able to access higher levels of education. Researchers have found that first-generation college students are more likely to be ethnic minority students and more likely to be from a low- or middle-class family as compared to continuing education students who are more likely to be White and from a middle to upper class family. In one study (Bui, 2002) 8% of first-generation student participants were White, 31% were Latinx, 53% were Asian, and 8% were other unspecified ethnicities. Another article examining differences between first-generation and continuing-generation college students reported similar race/ethnicity discrepancies (Redford & Hoyer, 2017). Specifically 49% of first-generation students were White while 70% of the continuing-generation students were White; 14% of first-generation students were Black while 11% of continuing-generation students were Black; 27% of first-generation students were Hispanic or Latinx, while 9% of the continuing-generation students were Hispanic or Latinx; 5% of first-generation students were Asian while 6% of the continuing-generation students were Asian, and finally 5% of first-generation students were other while 4% of the continuing-generation students were other. In this report other included American

Indian/Alaska Native, Native Hawaiian/Pacific Islander, and students of two or more races (Redford & Hoyer, 2017). First generation college students were more likely to come from low SES families compared to the continuing-generation peers (Redford & Hoyer, 2017). Specifically, 27% of first-generation college students came from a household that made less than \$20,000 per year and 50% came from a household that made \$20,001 to \$50,000 per year. In comparison only 6% of continuing- generation students came from a household that made less than \$20,000 per year and 23% came from a household that made \$20,001 to \$50,000 per year (Redford & Hoyer, 2017).

Historically low SES and minority students have accessed higher education at a significantly lower rate than White, higher SES students (Tekleselassie, Mallery, & Choi, 2013; U.S. Department of Education, 2001; Yeager, Purdie-Vaughns, Hooper, & Cohen, 2017). Specifically, 82% of high school students from high SES families enroll in college right after graduation compared to 58% of high school students from low SES families (Ma et al., 2016). Additionally, 64% of White recent high school graduates enroll in college compared to 55% of Hispanic students and 53% of Black students (Ma et al., 2016). This trend even applies to high achieving students as researchers estimate approximately 35,000 low SES students with SAT scores in the top 10% did not even apply for a single highly selective school (Hoxby & Avery, 2012). Additionally, 150,000 low SES and minority high school graduates chose to enroll in less selective universities than their grades, test scores, would predict (Snyder & Dillow, 2013).

Ethnic minority students are more likely to attend 2-year colleges instead of 4-year colleges (U.S. Department of Education, 2001). Students may choose to attend 2-

year colleges instead of 4-year colleges due to the higher tuition costs at 4-year colleges or because they may require the flexibility of class schedules offered by 2-year colleges in order to meet their other responsibilities of caregiver, spouse, and employee (Bui, 2002). However, first-generation college students are more likely to earn a bachelor's degree if they begin at a 4-year institution as opposed to a 2-year institution (Bui, 2002).

Some possible barriers low SES and ethnic minority students encounter when applying to colleges are lack of college experience and reduced resources compared to middle and high SES families (Schneider, 2015). For example, many low SES parents cannot afford personal academic tutoring or the cost of extracurricular activities many colleges search for in a student's application (Schneider, 2015).

At-Risk Students and College Preparation, Enrollment, and Continuation

Educationally or financially disadvantaged students are less likely to apply for college and less likely to complete a degree than students who are not at risk (Chaney et al., 1998). For example, a researcher found that the SES status of a student's neighborhood is a better predictor of college graduation than high school graduation (Owens, 2010). In a longitudinal study, researchers found the amount of financially stable individuals (in the top-quartile) completing a bachelor's degree or higher was 60% (Lauff & Ingels, 2014). In comparison, only 14% of financially disadvantaged students (in the bottom quartile) completed a bachelor's degree (Lauff & Ingels, 2014). Similar results were reported in a prior study; the estimated likelihood of financially stable individuals

(in the top-quartile) completing a bachelor's degree by age 24 was 79% in 1994 (Mortenson, 1997). In comparison, the estimated likelihood of individuals in lowest quartile completing a bachelor's degree by age 24 was 8% in 1994 (Mortenson, 1997). Sadly, even high achieving underrepresented ethnic minorities are failing to attend/graduate from college (Contreras, 2011). For example, only slightly more than half of Latinx and Black students go directly to college after high school (EPE Research Center, 2011; Losen, Orfield, & Balfanz, 2006; Orfield, 2004).

At-risk students also have other non-education or financial factors that make succeeding in higher education more challenging (Chaney et al., 1998). As discussed earlier Tinto (1975) posits one of these factors is integration into the college. Integration can be understood as how much the individual shares attitudes and values that are common among their peers and within the faculty at the college (Chaney et al., 1998). At risk students often enter college academically underprepared and also struggle to integrate into the college community as readily as non-disadvantaged students (Chaney et al., 1998), which can result in isolation and cause students to withdraw (Tinto, 1975).

Researchers studying college readiness surveyed 2,942 eighth- and 10th-grade students from urban and suburban schools in the U.S. with students from diverse social and economic backgrounds (Wimberly & Noeth, 2005). It was reported that low income and ethnic minority students often top out at lower level math courses in high school compared to their middle income or White peers. In another study researchers found racial minority students had lower math achievement scores than their White peers (Lee, Daniels, Puig, Newgent, & Nam, 2008). Although the requirements for math in high

school have changed so that in many states students must take math every year, there is no national math level requirement for high school graduation (Wimberly & Noeth, 2005).

Another study reported that taking upper division math in high school is strongly associated with enrollment in 4-year colleges (Choy, 2001). For example, 76% of high school students who had taken advanced math courses in high school had enrolled in a 4-year college within 2 years of high school graduation (Choy, 2001). In comparison, 44% of students who had taken middle level math courses (e.g., did not go beyond Algebra 2) in high school had enrolled in a 4-year college within 2 years of high school graduation. Finally, only 16% of students who had completed lower level math courses (e.g., only algebra 1 and geometry) in high school had enrolled in a 4-year college within 2 years of high school graduation (Choy, 2001).

Student Support Services

To address these college retention risk factors, different support services are put in place. One of the largest support programs at universities for students from disadvantaged backgrounds is SSS. This program is one of six federally funded programs through the U.S. Department of Education through TRIO. TRIO is a group of federally funded college opportunity programs that assist disadvantaged students. TRIO was originally created during President Lyndon B. Johnson's War on Poverty. In 1968 Special Services for Disadvantaged Students (now known as Student Support Services) was established.

In order to qualify for SSS, students must meet one or more of the following criteria: low income, first-generation, or physical disability (Council for Opportunity in Education, n.d.). Specifically, “two-thirds of the students served must come from families with incomes at 150% or less of the federal poverty level and in which neither parent graduated from college” (Council for Opportunity in Education, n.d.). SSS has three goals. The first goal is to increase college retention and graduation rates for students who meet the outlined criteria (Chaney et al., 1998). The second goal is to increase the rate qualifying students transfer from a 2-year to a 4-year college (Chaney et al., 1998). Finally, the third goal is to create a college community that promotes success for students who are financially disadvantaged, first-generation, or have a physical disability (Chaney et al., 1998).

Student Support Service Programs are now available at 1,081 universities nationwide (Council for Opportunity for Education, n.d.). These programs have been shown to increase a students’ overall GPA and overall academic standing (Chaney, Muraskin, Calahan, & Rak, 1997). Additionally, with the support this program provides students enrolled in SSS on average complete a 4-year degree more often than similarly situated peers (48% to 40%; Council for Opportunity for Education, n.d.). Also, students participating in SSS on average have an 11% increase in academic good standing between their first and senior years (Council for Opportunity for Education, n.d.). While the services provided by SSS are beneficial for academic success, there are other individual characteristics that can also impact academic success.

Self-Efficacy

One characteristic that has proven to promote academic success in all levels of education is self-efficacy (Bandura et al., 1996; Mattern & Shaw, 2010; Schunk, 1981, 1983; Schunk & Swartz, 1993). Bandura (1977) first presented Social Cognitive Theory and self-efficacy in 1977. Self-efficacy often predicts how an individual creates goals, task persistence, and achievement. For example, if a person believes he/she will be put into a situation that he/she is not capable of handling, the person will avoid the situation. In contrast, if a person is in a situation in which he/she feels confident he/she can control the person will likely actively participate. Self-efficacy is often influenced by four scenarios: personal experiences, vicarious experiences, encouragement from others, or emotional responses (Schunk & Meece, 2006). Personal experiences are the most predictive of an individual's self-efficacy because if a person has succeeded multiple times in a specific scenario he or she is more likely to feel confident if put in a similar situation (Schunk & Meece, 2006).

An individual's self-efficacy is first formed in infancy. Different experiences provide children with the successes and failures necessary to cultivate their self-efficacy. In general, families from a higher socioeconomic class can provide their children with more experiences to improve their child's self-efficacy, than families from a lower SES (Schunk & Meece, 2006). Experiences such as camps or classes can also affect children's self-efficacy by providing them various opportunities to succeed. Finally, families also influence their children's self-efficacy by the environment created at home. Families that provide motivation and support during challenges can improve their child's self-efficacy.

Upon entering school children are given numerous experiences to continue shaping their self-efficacy. Some of these experiences include instructional times where a child is asked to complete a novel task, the feedback a child receives, and challenges the child may face (Schunk & Meece, 2006). For example, if a child fails to complete a novel task successfully it may result in a decrease in self-efficacy. Similarly, if a child receives excessive feedback or attention from a teacher he or she may feel he/she is unable to complete the task without assistance and thus will suffer from a decrease in self-efficacy. In adolescence self-efficacy is largely shaped by peer interactions (Schunk & Meece, 2006). Through the use of social comparisons an adolescent can decipher or predict his/her own ability to cope within a situation, thus altering his/her level of self-efficacy. The relationship between self-efficacy and a multitude of variables (e.g., life satisfaction, Smith et al., 2016; revictimization, Bockers, Roepke, Micheal, Renneberg, & Knaevelsrud, 2014; and smoking cessation, J. R. Hughes & Naud, 2016) has been studied, but the positive relationship between self-efficacy and academic achievement and persistence was the focus of this study.

Many researchers have conducted studies regarding self-efficacy and academic achievement and persistence (Honicke & Broadbent, 2016; Multon et al., 1991; Talsma, Schüz, Schwarzer, & Norris, 2018). A recent study used a meta-analytical design to explore the strength and directional effect of self-efficacy on academic achievement (Talsma et al., 2018). In order to determine which studies would be reviewed for this analysis the researchers only used studies that defined self-efficacy as “a personal judgement of ability to prospectively perform academically” and measured academic

performance using “objective scores on individual performance tasks, such as tests or exams” (Talsma et al., 2018, p. 139). A final set of 11 studies from the years of 1984 to 2016 were used to complete this analysis. This analysis specifically looked at whether performance is a greater predictor of self-efficacy or self-efficacy a greater predictor of performance. Although both prediction directions were significant, the strength of the relationship was greater for performance predicting self-efficacy (Talsma et al., 2018).

One study included in the meta-analytic review conducted by Talsma et al. (2018) was a meta-analysis studying antecedents to college student GPA (Richardson, Abraham, & Bond, 2012). This meta-analysis included 7,167 articles published between the years of 1997 to 2010. The analysis demonstrated small to no significant correlations between demographic variables, motivation, intelligence and personality on college GPAs. Medium correlations were reported for high school GPA or standardized testing (i.e., SAT or ACT) with college GPA. Medium sized correlations were also reported between academic self-efficacy and college GPA. Finally, large correlation was found between performance self-efficacy and college GPA (Richardson et al., 2012).

In a previous meta-analysis, researchers reviewed studies regarding self-efficacy and academic achievement and persistence (Multon et al., 1991). In order to determine which studies would be reviewed for this analysis the researchers only used studies that contained a self-efficacy measure, an academic performance or persistence measure, and enough information to determine effect size (Multon et al., 1991). A final set of 39 studies from the years 1977 to 1988 were used to complete this analysis. This analysis determined that self-efficacy has a moderate effect on academic achievement, $r = .38$, and

accounted for 14% of the variance in a student's academic performance (Multon et al., 1991). The analysis also determined that self-efficacy has a moderate effect on persistence, $r = .34$, and accounted for 12% of the variance in a student's level of persistence (Multon et al., 1991).

One study included in the meta-analytic review by Multon et al. (1991) was a study that assessed whether self-efficacy, as well as additional variables such as gender or course section, could predict academic grades, persistence, and career goals (Lent et al., 1986). The study used convenience sampling of 105 (75 men and 30 women) undergraduate students. The participants were primarily first and second year undergraduates considering science and engineering majors and careers with a mean age of 20. No other demographic information was reported. A three-way repeated measures analysis of variance found no significant main or interaction effects when examining the effects of gender or course section differences on self-efficacy. Through the use of hierarchical regression analysis self-efficacy significantly predicted academic grades, persistence, and career goals. This is important because this link was significant even after "math ability, high school achievement, and vocational interest" had been accounted for (Lent et al., 1986, p. 268).

Another study included in the meta-analytic review by Multon et al. (1991) was a study that assessed how attributional feedback affected a child's perceived self-efficacy and achievement (Schunk, 1983). In this study the researcher recruited 44 third-grade students (24 men and 20 women) using a convenience sampling method. The students were predominantly middle class and were between 8 and 10 years of age. The children

went through a series of tests and trainings involving attributional feedback during subtraction competency tests. By providing attributional feedback, the children increased problem-solving times, reported better self-efficacy, and showed improved achievement (Schunk, 1983).

A later study examined how different variables such as family expectations and self-efficacy affect academic achievement (Bandura et al., 1996). Researchers recruited 279 children, ages 11-14, as well as their mothers, and teachers to participate in this study. The children, mothers, and teachers were all given various scales to assess perceived self-efficacy, academic self-efficacy, and efficacy involving group activities (Bandura et al., 1996). The study found multiple associations between various variables and academic achievement. For example, researchers found that parents who believed in their ability to create good learning environments for their children had children with better academic achievement scores compared to parents who did not believe in their ability to create successful learning environments. The study also supported previous research that found that students who have a good academic self-efficacy, that is they believe they have control over their learning and success in the classroom, were also more likely to succeed than students with lower levels of academic self-efficacy (Bandura et al., 1996).

An additional study conducted in the school setting examined the influence of writing self-efficacy and writing comprehension on essay writing performance (Pajares & Johnson, 1996). Participants in this study were 181 ninth grade, public school students in the southwest U.S. Researchers found that students' self-efficacy significantly predicted

their writing performance. This is important because it shows that self-efficacy can impact specific subjects, and not just overall academic achievement.

Another study examined the influence on self-efficacy on math performance (Pajares & Graham, 1999). In this study 273, academically and racially diverse sixth graders were recruited using a convenience sampling method. Multiple regression analyses were used to determine if, when other variables such as race, gender, and academic giftedness were controlled for, self-efficacy predicted math performance. The researchers found that self-efficacy had a large effect on math performance ($r = .57$ fall, $r = .59$ spring). This study is important because unlike some previous studies multiple other variables were controlled for when determining this significant link between self-efficacy and performance.

Because self-efficacy has been positively associated with academic performance it is important to understand how self-efficacy can be improved. One way self-efficacy can be improved in the classroom is by instructors providing positive learning experiences in which a student is successful (Schunk & Meece, 2006). By ensuring a student's initial success that student will likely feel more confident in his/her abilities to complete future tasks. Another way to improve self-efficacy within the academic setting is the use of peer mentors. If a student sees a peer of similar academic ability succeeding in a task, that student will likely feel more confident in his or her ability to also successfully complete the task (Schunk & Meece, 2006).

School personnel can also promote self-efficacy in students by creating successful transitions into new environments. For example, if a peer mentorship system is

implemented in which an established student assists a new student in transitioning successfully into a new environment the new student will likely feel more confident and comfortable because the setting will be more familiar. Similarly, if classroom instructors make it a point to create an inviting and communicative setting in which students are encouraged to ask questions and success is promoted the new student will feel encouraged to reach out to if he or she has questions or concerns (Schunk & Meece, 2006).

Self-Efficacy and First-Generation Students

Researchers argue that first-generation students hold a meaningful cultural identity (Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012). First-generation students face identity threat in college because of the cultural mismatch between their personal values and the values promoted within a university. Specifically, researchers argue that first-generation students often endorse interdependent values that do not match the independent values endorsed by American collegiate institutions. This identity threat can negatively impact a student's self-efficacy. In studies by Harackiewicz et al. (2014) and by Tibbetts et al. (2016) a values affirmation writing assignment was used to minimize the negative effects of this identity threat caused by the cultural mismatch.

Due to the relationship between personal values and college retention, one study examined the effectiveness of a values affirming intervention in promoting first-generation students to continue seeking their undergraduate degree in biology (Harackiewicz et al., 2014). Researchers recruited a sample of 806 (328 men and 478

women) participants. In this sample, 7.6% of students were underrepresented ethnic minorities (URM: African American, Hispanic, or Native American), and 92.4% of students were majority students (White or nontargeted ethnic minorities). Of the majority students, 80% were White and 12.4% were Asian or Asian American. Of the participants 644 were continuing generation students (2.6% African American, 3.1% Hispanic, and 1% Native American) and 154 were first-generation students (3.2% African American, 7.1% Hispanic, and 1.3% Native American). This double-blind experimental design study randomly assigned students to either complete a values-affirming writing assignment or a control writing assignment. These writing assignments were given twice, once in the beginning of the course and once shortly before the second course midterm (Harackiewicz et al., 2014). Three outcome measures were utilized: final course grade, semester GPA, and continuation in the biology major in the following semester (Harackiewicz et al., 2014). While a significant difference between course grades was found when comparing first-generation students and continuing-generation students, the values affirming intervention resulted in a significantly reduced achievement gap. Specifically, in the control group the achievement gap between first-generation students and continuing generation students was $d = 0.39$. However, in the values affirming intervention condition the achievement gap between first-generation students and continuing generation students was $d = 0.18$. This shows that the values affirming intervention reduced the achievement gap between first-generation and continuing-generation students by 50%. Researchers also found that the first-generation values affirmation group achieved higher GPAs (approximately a quarter of a grade point

higher) than the first-generation control group (Harackiewicz et al., 2014). Finally, by using binary logistic regression researchers found that the values affirming intervention significantly increased a first-generation student's likelihood in continuing to work towards earning an undergraduate degree in biology (Harackiewicz et al., 2014). Some possible limitations of this study include the limited number of ethnic minority students in the sample and the inability for the researchers to measure the variables that had mediating effects on the values affirming intervention. The limited number of ethnic minority students represented in the study may have allowed researchers to better determine if it was the participants first-generation status that affected the effectiveness of the values affirming intervention, however since many first-generation students are also ethnic minority students (Bui, 2002) this sample was not truly representative of first-generation college students. Finally, only students in a requisite biology class for pre-medical careers were participants in this study. By eliminating students with all other career aspirations from this study a considerable portion of first-generation students were likely excluded.

A longitudinal follow-up study on the study done by Harackiewicz et al. (2014) found the treatment effects on academic achievement persisted three years later (Tibbetts et al., 2016). This longitudinal follow up study also explored whether or not the "values affirmation effects were predicated on first-generation students reflecting on interdependent values (thus affirming their values that are consistent with working-class culture) or independent values (thus affirming their values that are consistent with the culture of higher education)" (Tibbetts et al., 2016, p. 635). Researchers found that the

first-generation students who wrote about independent values, from a list of predetermined 12 independent and interdependent values, had better semester grades as well as overall GPAs. Finally, researchers conducted a study to determine if the amount the first-generation student wrote about their independent values affected their scores on a math test. Researchers found a significant positive relationship between writing more about independent values and better math test scores (Tibbetts et al., 2016). It is important to note that Tibbetts et al. (2016) did not try to change participants' core values, but instead encouraged participants to think about their personal independent values that are more congruent with the university culture. Some possible limitations of this study included attrition of the initial study participants, history, and maturation. Because this study was a longitudinal design using the same sample as a study from three years prior 49 of the participants in the initial study either graduated, dropped out of school, or transferred to a different school (94% of the original sample continued). It is also unknown if any significant event happened at the school or in the area that would impact student's academic achievement. Finally, it cannot be determined that the values affirming intervention is what caused the continued elevated levels of academic achievement over students growing older, wiser, and more experienced.

Summary

Given the risks students in the TRIO program face in regards to academic success and attrition it is important to study what interventions can be put in place to help these students succeed in higher education. A values-affirming intervention for these students

may be one protective factor universities can implement to help these at-risk students succeed.

CHAPTER III

METHODS

Participants

Participants were 24 undergraduate students from a SSS math or statistics course. Students were 11 men, 12 women, and 1 unspecified gender. They ranged in ages from 18 to 45 ($M = 25.54$, $SD = 6.97$). All 24 students completed the demographics questionnaire and academic self-efficacy scale prior to the values affirming intervention. Of those 24 students, 15 students (Male = 7, Female = 7, and Unspecified = 1; ages 18-45, with a mean age of 25.47, $SD = 7.80$) participated in each step of the intervention and completed the self-efficacy questionnaire after the values affirming interventions had been provided. Participants were from 16 different majors. The top two majors reported were undeclared (16.7%) and Pre-Business (12.5%). Complete demographic information on participants is in Table 1. Participants were recruited in January of 2017 and data collection ended in May of 2017. After data collection, data for 24 matched peers were also gathered using historical data from SSS enrolled between the years of 2007 to 2016. All students recruited met the criteria for SSS: first generation status, have a documented disability, and/or be low income. Of the 24 participants 62.5% were first generation college students, 41.7% had a documented disability, and 25.9% were low income.

Setting

This study was conducted at a public university in collaboration with the SSS

Table 1

Demographic Characteristics of Students in the Sample

Variables	Current participants					
	Total current sample ($N = 24$)		Students who completed all intervention components ($N = 15$)		Historical control students ($N = 24$)	
	%	n	%	n	%	n
Gender						
Male	45.8	11	46.7	7	--	--
Female	50.0	12	46.7	7	--	--
Unspecified	4.2	1	6.7	1	--	--
Ethnicity						
Black or African American	2.1	1	0.0	0	--	--
Hispanic, Latino(a) or Spanish origin	25.0	6	33.3	5	--	--
Native Hawaiian or Another Pacific Islander	8.3	2	6.7	1	--	--
White	54.2	13	46.7	7	--	--
Biracial	8.3	2	13.3	2	--	--
Religion						
Religious, but not affiliated	4.2	1	6.7	1	--	--
Catholic	8.3	2	13.3	2	--	--
LDS	66.7	16	60.0	9	--	--
Prefer not to answer	8.3	2	6.7	1	--	--
None	8.3	2	13.3	2	--	--
Christian (not further specified)	4.2	1	0.0	0	--	--
Year in school						
Freshman	37.5	9	46.7	7	--	--
Sophomore	20.8	5	13.3	2	--	--
Junior	29.2	7	26.7	4	--	--
Senior	12.5	3	13.3	2	--	--
Taken the same math course previously						
No	83.3	20	80.0	12	83.3	20
Yes	16.7	4	20.0	3	16.7	4
If taken math course previously						
SSS course	25.0	1	50.0	1	0.0	0
Not SSS course	75.0	3	50.0	1	100.0	4
Education status						
First generation	62.5	15	66.7	10	45.8	11
Continuing generation	37.5	9	33.3	5	54.2	13

(table continues)

Variables	Current participants					
	Total current sample ($N = 24$)		Students who completed all intervention components ($N = 15$)		Historical control students ($N = 24$)	
	%	n	%	n	%	n
Highest degree mother achieved						
No high school diploma	16.7	4	20.0	3	--	--
High school diploma	33.3	8	26.7	4	--	--
Some college	16.7	4	20.0	3	--	--
Trade school	8.3	2	13.3	2	--	--
Associate's degree	4.2	1	6.7	1	--	--
Bachelor's degree	16.7	4	6.7	1	--	--
Master's degree	4.2	1	6.7	1	--	--
Highest degree father achieved						
No high school diploma	26.1	6	28.6	4	--	--
High school diploma	30.4	7	28.6	4	--	--
Some college	8.7	2	7.1	1	--	--
Trade school	8.7	2	14.3	2	--	--
Bachelor's degree	21.7	5	21.4	3	--	--
Master's degree	4.3	1	0.0	0	--	--
SES (Received Free and Reduced Lunch)						
No	75.0	18	80.0	12	45.8	11
Yes	25.9	6	20.0	3	54.2	13
Disability status						
No	54.2	13	46.7	7	62.5	15
Yes	41.7	10	46.7	7	37.5	9
Prefer not to answer	4.2	1	6.7	1	0.0	0
Disability type						
A sensory impairment (vision or hearing)	12.5	3	20.0	3	--	--
A physical or mobility impairment	8.3	2	0.0	0	--	--
A learning disability (e.g., ADHD, dyslexia)	20.8	5	13.3	2	--	--
A mental health disorder	16.7	4	13.3	2	--	--
A disability or impairment not listed above	4.2	1	0.0	0	--	--

Note. Information not available is noted with a --.

program. SSS provides specialized courses available only to students who qualify.

Because of the increasing university requirements and demand in jobs requiring math skills SSS offers three math classes (College Math Preparation, Algebra 1, and

Introduction to Statistics) to provide critical support at the foundational level. These

courses have small class sizes with the enrollment capped at 15 students. This smaller class size allows for more intensive support because of the smaller student to teacher ratio. Other benefits of this smaller class size include better student-teacher rapport and increased assistance from teachers in the event of individual performance drop. SSS courses also have more weekly class lecture time than the mainstream courses. SSS courses provide 300 min of class time for every math or statistics course compared to 200 min for mainstream College Math Preparation and 250 min for mainstream Algebra 1 and Introduction to Statistics courses. Finally, unlike mainstream courses SSS courses all require students to engage in best practice study skills such as prereading preparation before lectures and exam corrections. These best practice study skills are encouraged by providing students assignments, due before class, which require they record their prereading impressions or reading comprehension quizzes. Data for this study were collected in the College Math Preparation course, Algebra 1, and Introduction to Statistics SSS classes offered in the spring semester of 2017.

Measures/Materials

Demographics

A demographics questionnaire was given (Appendix A). The questionnaire consisted of questions such as “Are you a first-generation college student” and “please mark the highest level of education your mother/father received.” The questionnaire included a question about if the student has attempted this math class before, and if so was the class through SSS. Finally, the questionnaire contained items about low-income

(through the use of free and reduced lunches in high school as a proxy) and disability status. These questions were created to assess the complex nature of an individual's identity and options were formed to be inclusive (Hughes, Camden, & Yangchen, 2016).

Academic Self-Efficacy

Students completed the College Academic Self-Efficacy Scale (Owen & Froman, 1988). The College Academic Self-Efficacy Scale is used to measure a student's present level of academic self-efficacy. The scale consists of 33 questions and uses a Likert scale response format ranging 1 (*very little*) to 5 (*quite a lot*). This scale asks students to rate how confident they are on various academic tasks such as "writing a high-quality term paper" and "making good use of the library" (Owen & Froman, 1988). The internal consistency reliabilities at two administrations eight week apart were alpha .90 and .92. The 8-week stability was .85 (Owen & Froman, 1988). Authors presented evidence of both concurrent and construct validity for this measure (Owen & Froman, 1988). In this study the internal reliability for the two administrations were alpha .822 (pre-intervention) and alpha .918 (post-intervention).

Values Affirmation Writing Intervention

Finally, a values list was provided (see Appendix B) to all participants. The values list was comprised of the six values most highly correlated independent and interdependent writing as determined by the study completed by Tibbetts et al. (2016). The values were: independence, learning and gaining knowledge, curiosity, relationships with friends and family, belonging to a social group, and/or spiritual or religious values.

The first three values were originally included in the Harackiewicz et al. (2014) study and were identified in the Tibbetts et al. study as being the most highly correlated with independent writing. The last three values were originally included in the Harackiewicz et al. study and were identified in the Tibbetts et al. study as being the most highly correlated with interdependent writing.

Procedure

Prior to research taking place the research was approved by the university Institutional Review Board. Approval to provide this values-affirming intervention in SSS math courses was given by the program director of SSS. Thirty-eight students from three SSS math classes were asked at the beginning of the semester to participate in the study that would involve completing measures and giving consent for their math grades and overall semester GPA to be obtained. Of those 38 students, 24 students consented to participate.

During the first week of the semester, class time was taken completing the demographics questionnaire and the College Academic Self-Efficacy Scale (Owen & Froman, 1988). To prevent taking too much instructional time from one unit the first values affirming intervention was administered in week two. The second values affirming intervention was administered in week ten because it was after midterms when students were less likely to be stressed from frequent exams. Finally, the last week of the semester students completed another academic self-efficacy scale. The night before each value affirming writing intervention was administered in class, the course instructor emailed the

following statements to students:

Tomorrow there will be a special writing exercise in the first 10 or 15 minutes of class. This writing exercise is part of the study you were asked to participate in at the beginning of the semester. This is designed to give you additional practice in both critical thinking and writing which are essential parts of any career. There is no need to study for this. This in-class writing will be about something that you know well. I will administer the writing exercise. If you consented to participate in the study I will provide the researcher the completed exercise. This is one of two such exercises which are required in class.

The classroom instructor distributed the writing assignment. Each writing assignment consisted of a three-page packet. The first page consisted of a list of values. Since value affirmation has been shown to be especially beneficial in promoting academic performance, all students were assigned the same six values. The values were: independence, belonging to a social group, spiritual or religious values, learning and gaining knowledge, curiosity, and relationships with friends and family. These values were a mix of independent and interdependent values. On the values students were instructed to choose two or three of the most important values and circle them. The second page was for the writing assignment. The prompt was to “write about why those values are most important to you.” Students had 10 min to write about why their chosen values were most important to them. The values affirming intervention was not intended to promote independent values or interdependent values, but to instead clarify which values are most salient to each individual. The last page asked participants to summarize their thoughts in two sentences as a final way of having them reflect on their selected values. This final summary was not used in the data analysis, but instead was intended to provide a space for students to summarize and conclude their thoughts on which values were most salient to them.

The values affirming intervention was provided in class regardless of consent, but only consenting students had their grades reviewed. Of students who consented, only 15 completed all components of the study. All 24 participants who consented to the entire values affirming intervention had semester grades and math course grades, obtained from personnel in SSS and the Academic Success Office, compared to de-identified historical data received from personnel in SSS. Students were matched based on demographic variables and previous math class failures. Due to limited demographic data available from the historical control students, participants were matched based on whether or not they had taken the specific math class before (and if so if it was offered by SSS or not), student college generation status, SES status, and disability status. When matching students, the first variable considered was whether or not the student had previously taken the course. Then disability status was matched, followed by student generation status. Finally, SES status was matched. If multiple matches were found each match was assigned a number and a random number generator was used to determine the match.

Although 24 students consented to the intervention, only 21 students completed the entire class and earned a semester grade. Only 23 students remained enrolled in at least one class during the semester of data collection and could therefore have a semester GPA calculated. Finally, only 15 students completed at least 29 of the 33 questions on the self-efficacy scale and were therefore considered for analysis. Based on an a priori power analysis a sample size of 34 students would be needed to detect a medium effect size of .80 at an alpha of .05. However, since this study was only intended as a pilot study for a small group of participants, no additional recruiting was attempted.

CHAPTER IV

RESULTS

To understand the relationship between variables of interest in this study, correlations between semester math grades, semester GPA, and pre and post intervention self-efficacy were calculated for the intervention group participants. There was a significant relationship between a student's semester math grade and semester GPA, $r(22) = .745, p < .001$. Neither pre nor post self-efficacy scores were significantly correlated with semester math grade or GPA. See Table 2 for complete correlations.

Table 2

Correlations Among Primary Variables for the Intervention Group

Variables	Semester math grade	Semester GPA	Pre-intervention self-efficacy	Post-intervention self-efficacy
Semester GPA	.745**			-.034
Pre-intervention self-efficacy	.388	.036		.589*
Post intervention self-efficacy	.315	-.034	.589*	1

* $p < .05$.

** $p < .01$.

Within the historical control group participants, there was a significant correlation between semester math grades and semester GPA, $r(23) = .941, p < .001$.

To determine if the completion of a values affirming intervention in an SSS math course improved semester math course grades a paired samples *t test* was used. The test compared semester math grades of students who participated in the values affirming

intervention to matched, historical control students who did not complete the values affirming intervention. Grades were measured on a typical 4.0 scale where higher grades are better. Overall students who completed the values affirming intervention and completed the math course ($n = 21$) had an average math grade of 1.97. In comparison historical control students who did not complete the values affirming ($n = 21$) intervention had an average math grade of 2.48. The results showed no significant difference between math semester grades of the treatment and historical control group, $t(20) = -1.09, p = 0.287$. Additional results information can be found in Table 3.

Next a paired samples t test was used to determine if Student Support Service students assigned to complete a values-affirming writing intervention had a higher semester GPA compared to historical controls. The test compared semester GPAs of students who participated in the values affirming intervention to historical control students who did not complete the values affirming intervention. Overall students who completed the values affirming intervention and remained enrolled in at least one class for the semester ($N = 23$) had an average GPA of 2.81. In comparison historical control students who did not complete the values affirming ($N = 23$) intervention had an average GPA of 2.88. The results showed no significant difference between semester GPAs of the treatment and control group, $t(22) = -0.260, p = 0.797$. Additional results information can be found in Table 3.

Finally, a paired samples t test was used to determine if the values affirming writing intervention positively improved students' academic self-efficacy. Students' preintervention academic self-efficacy scores were compared to their post-intervention

academic self-efficacy scores. Before the intervention students' (N = 15) average self-efficacy score was 3.31. In comparison after the values affirming intervention students' (N = 15) average self-efficacy score was 3.64. The results showed a significant increase in academic self-efficacy from pre-intervention to post-intervention, $t(14) = -2.858, p = .013$. Additional results information can be found in Table 3.

Table 3

Means, Standard Deviations, and Paired Sample t Tests for Main Variables

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	Ranges	<i>t</i> values	<i>ES</i>
Semester math grade					$t(20) = -1.094, p = .287$	$d = -.372$
Intervention	21	1.97	1.39	0.00 - 4.00		
Historical	21	2.48	1.35	0.00 - 4.00		
Semester GPA					$t(22) = -0.260, p = .797$	$d = -.068$
Intervention	23	2.81	0.82	0.93 - 4.00		
Historical	23	2.88	1.21	0.00 - 4.00		
Academic self-efficacy					$t(14) = -2.858, p = .013$	$d = -.687$
Pre-intervention	15	3.31	0.46	2.55 - 3.97		
Post intervention	15	3.64	0.50	2.97 - 5.00		

CHAPTER V

DISCUSSION

This study examined the impact of a value's affirming intervention on self-efficacy, semester math grades, and semester GPA. In this study students' academic self-efficacy did significantly increase after the values affirming intervention was administered. Increased academic self-efficacy is a strong predictor of academic success (e.g., Bandura et al., 1996; Multon et al., 1991; Pajares & Graham, 1999;) and, therefore, healthier, wealthier, and more civically engaged members of society (Baum & Payea, 2005; Hout, 2012; Kingston et al., 2003). However, despite previous research demonstrating the positive effect of the values affirming intervention on grades, in this study the values affirming intervention did not lead to significantly improve semester math course grades or semester GPAs. Some possible reasons that the values affirming intervention did not improve semester math course grades or the effect of the intervention was not detectable may include the small sample size, lack of random assignment, or the specific population chosen.

There is also a possibility that despite previous demonstrated benefits of this intervention that there is no effect within this specific population. For example, if the students in the intervention group did not have the necessary foundational math skills to be successful in this course then improving their academic self-efficacy would not improve their math achievement because of their significant skill deficit. This is commonly understood as skill versus will. This intervention is designed to target students who have the necessary skills to be successful, but are lacking the needed motivation or

self-confidence to be successful. If the students in the intervention group lacked the skill then instead of a self-efficacy intervention a skills-based intervention would have been more appropriate and likely would have had a larger impact on student achievement.

Limitations

As a result of the pilot nature of this study only a small sample of 24 students were recruited and only 15 of those completed pre- and post-measures. However, based on an *a-priori* test a sample size of 34 participants would have been needed to detect a medium effect. Ideally, this study would have included multiple semesters of SSS math courses so that a larger number of students could have received the values affirming intervention. With an increased sample size, it may have been easier to detect statistical significance. A larger sample size would also help to ensure a more representative sample of the SSS population, which would allow more definitive conclusions to be drawn about the SSS population as a whole. Future researchers may consider completing this study at larger schools with higher numbers of SSS students, or at multiple schools. In addition, future researchers may consider testing over multiple semesters or comparing students with similar backgrounds from SSS math classes to SSS eligible students in general math classes.

If a higher number of participants had been recruited then historical control data would not have been needed. Instead, students would have been randomly assigned to a values-affirming intervention or placebo group and comparisons could have been made between students taking the class from the same professor, at the same time, with the

same environmental conditions. The historical control sample was selected by matching students in the experimental group to students who had taken SSS classes between 2005 and 2016. By using historical controls from an eleven year span the students did not always have the same professor teaching the course, the class was not always offered at the same time, and the class may have been taught in different rooms or with different teaching methods that affected student performance. Also, when using historical controls not all demographic information was available which limited the researcher's ability to match on all contextual factors that may have had more bearing on grades.

Future Research

Future researchers may consider stating the learning target more clearly during the implementation of the intervention. Learning targets are written from a student's perspective and identify the skills the students will learn/implement and the reason those skills are important (Moss & Brookhart, 2012). Learning targets should be shared with students through words, pictures and/or actions. When students understand the lessons learning targets they are able to assess where their current understanding is versus where it needs to be, set specific goals to further their understanding, choose personalized strategies to help them achieve their goals, and assess their progress towards their goals (Moss & Brookhart, 2012). In the analysis of this study's values affirming writing intervention many students wrote in detail about their values during the first writing intervention. However, during the second values affirming writing intervention many

students wrote much less and provided fewer details. Some even stated they already did this and to refer back to their first response. With the implementation of learning targets, students may be able to better understand the purpose of identifying their values and how those values may impact their academic self-efficacy.

This present study supports prior conclusions that a values-affirming writing intervention can improve academic self-efficacy and thus may benefit students who are first generation, low socio-economic status, and/or have a disability. However, the small sample size and limited demographic information available on historical controls makes conclusions about the impact of the values affirming writing intervention on math semester grades and semester GPAs difficult to determine.

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APPENDICES

Appendix A
Demographics Questionnaire

Demographics Questionnaire

1. How do you currently describe your gender identity?
 - Please specify: _____
 - I prefer not to answer

2. What is your age in years?
 - Please specify: _____
 - I prefer not to answer

3. Which categories describe you? Select all that apply to you.
 - American Native or Alaska Indian- For example Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community
 - Asian- For example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese
 - Black or African American- For example, Jamaican, Haitian, Nigerian, Ethiopian, Somalian
 - Hispanic, Latino(a) or Spanish Origin- For example, Mexican or Mexican American, Puerto Rican, Cuban, Salvadorian, Dominican, Columbian
 - Middle Eastern or North African- For example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian
 - Native Hawaiian or Other Pacific Islander- For example, Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, Marshallese
 - White- For example, German, Irish, English, Italian, Polish, French
 - Some other race, ethnicity, or origin, please specify:

 - I prefer not to answer

4. How do you describe your religion, spiritual practice, or existential worldview?
 - Please specify: _____
 - I prefer not to answer

5. Year in school.

Freshman Sophomore Junior Senior Other

6. Major: _____

7. Have you taken this specific math class before?

Yes No

If Yes: Was it from Student Support Services? Yes No

8. Are you a first generation college student (i.e., your parents did not graduate from college)?

Yes No

9. Please circle the highest level of education you mother achieved.

No High School Diploma GED High School Diploma Some
College Associate's Degree Bachelor's Degree Master's Degree
Doctoral Degree (PhD, MD, JD) Other: _____

10. Please circle the highest level of education your father achieved.

No High School Diploma GED High School Diploma Some
College
Associate's Degree Bachelor's Degree Master's Degree Specialist
Degree
Doctoral Degree (PhD, MD, JD) Other: _____

11. In high school did you receive free or reduced lunch?

Yes No

12. Have you been diagnosed with any disability or impairment?

- Yes
- No
- I prefer not to answer.

If yes, which of the following have been diagnosed? (Mark all that apply)

- A sensory impairment (vision or hearing)
- A physical or mobility impairment
- A learning disability (e.g., ADHD, dyslexia)
- A mental health disorder
- A disability or impairment not listed above

Appendix B

Values List

Values List

Please circle two or three of the following values that you feel are most important to you.

Independence

Belonging to a Social Group

Spiritual or Religious Values

Learning and Gaining Knowledge

Curiosity

Relationships with Friends and Family

Write about why those values are most important to you.

Please summarize your thoughts on your selected values in two sentences.