

THE RELATIONSHIP BETWEEN  
PERSONALITY TYPE INDICATORS  
AND COLLEGE MATRICULATION  
OF SUMMER BRIDGE PARTICIPANTS

By

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#### Abstract

Scope and Method of Study: The purpose of this study was to examine the relationship between career-related personality type indicators and college matriculation of Summer Bridge participants from an engineering and architecture college. Summer Bridge participants who had graduated with engineering or another degree from the institution were examined separately, thus resulting in two datasets. Data included participants' results on the Do What You Are Assessment administered during the Summer Bridge program and University enrollment records. Chi-square analyses were conducted between career-related personality type indicators and matriculation for the entire sample and between personality type indicators and matriculation for graduates only.

Findings and Conclusions: Chi-square analyses revealed significance for the dimension of Sensing/Intuition and college matriculation for both the entire sample and graduates of engineering program or another degree program on campus. For both analyses, students with a result of Sensing were more likely to matriculate or graduate than those with a result of Intuition. Significance was also found in the dimension of Judging/Perceiving and college matriculation for the entire sample, with those having a result of Judging more likely to matriculate than those with a result of Perceiving. However, no significant relationship on this dimension was found for graduates. Although personality type indicator assessments are used in industry and higher education, they may not be the best instrument for gauging college success. Given the sample was limited to participants of a Summer Bridge program in an engineering and architecture college at one university, this study does not provide a diverse college sample and is not representative of other institutions.

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## CHAPTER I

### INTRODUCTION

One of the most prominent issues facing colleges and universities is college student retention. The National Center for Education Statistics (2019) determined 60 percent of first-time, full-time undergraduate students who began seeking a bachelor's degree at a 4-year, degree-granting institution in fall 2011 graduated by 2017 from the same institution. Although this percentage is perceived as improvement from recent years, institutions still seek to increase graduation rates (DeAngelo, Franke, Hurtado, Prayor, & Tran, 2011). Institutions have implemented programming to assist in countering the problems students face in college. These resources have included remedial courses, tutoring, relationship building, and study and social skill development. One area with little research has been the investigation of personality type indicators of today's college students and their relationship with college matriculation. Along with the growing need to fulfill industry demands in Science, Technology, Engineering, and Math (STEM), promotion efforts have increased to guide students who show interest or ability in these areas towards pursuing college majors and working in these fields. Yet, the demand in industry is still present and colleges are still working to improve retention numbers at their institutions.

Personality testing is not consistently recognized as a tool for aiding students in the matriculation process. Although some personality assessments are commonly used in industry, educational psychologists do not recognize all personality assessments as valid instruments. The validity and reliability of such instruments has not been directly supported when studied (Stein & Swan, 2019). Personality assessments that provide career-related personality type indicator results are commonly used in industry as a part of the hiring process and for team building (Yilmaz, O'Connor, Colomo-Palacios, & Clarke, 2017). College career consultants have also used career-related personality assessments when helping students determine their interests and values, which has sometimes helped students determine a major (Gordon & Steele, 2015). The personality type indicator results have also been used to help faculty design courses and instruction to connect with their student body (Chang & Chang, 2000). Yet, there has been very little investigation into the correlation between personality-type indicator results and college matriculation.

The "Do What You Are" assessment (DWYA) is an assessment based on the Myers-Briggs Type Indicator (MBTI) questionnaire that helps identify personal preferences that can apply in a work environment. The DWYA has been used on college campuses to identify individual preferences and assist students with determining possible college majors and future occupations (Tieger & Barron-Tieger, 1993). Although the degree to which knowledge of personal preferences may be related to academic perseverance and college graduation remains unknown, neglecting such information may do a disservice to the student. Furthermore, determining a relationship between personal preferences and academic success could indicate a need to identify personal preferences

prior to or during college academics. There may be a need for identifying students who need additional support or access to certain resources to succeed in their chosen field of study based on their personal preferences.

### **Problem Statement**

College student matriculation has been studied in recent years. Although college enrollment has increased, college graduation rates have not increased in the same manner (Millea, Wills, Elder, & Molina, 2018). Researchers have conducted studies to distinguish areas of focus to help students be successful in college. These areas have included remedial courses or college leveling courses (Pulley, 2008), campus resources (Dumke, Tyndall, Naff, Crowder, & Cauley, 2018), social/family relationships (Kelly, LaVergne, Boone, & Boone, 2012), financial aid (Scott, Miller, & Morris, 2016), and pre-college admission exams (Noble & Sawyer, 2004). As a result, special programs have been developed to assist students with the transition to college and provide ongoing support throughout their collegiate journey. One program that is growing on college campuses is Summer Bridge Programming, designed to help students successfully transition from high school to college by exposing students to services, courses, and college life prior to the first day of classes (Slade, Eatmon, Staley, & Dixon, 2015). These programs have often targeted underrepresented populations, first-generation college students, and students of lower economic status or from rural school districts. Previous research has provided evidence these populations struggle with completing college degrees (Tieken, 2016). Several Summer Bridge programs focus on STEM majors because these areas can be challenging for students who may be underprepared academically, socially, or emotionally (Ashley, Cooper, Cala, & Brownell, 2017).

One key factor these programs may be overlooking is the student's preferences. Career-related personality type indicators may provide insight to college success, particularly if support services and college personnel have the resources to help students. Several factors have been investigated for impact on college student matriculation. Many of these factors focus on the background of students such as their socioeconomic status, but not students' preferences. High school requirements and pre-college programming focus on building college readiness, but have failed to mention systematic study on students' personality type indicators. Exploring the interests and personality type indicators of students at the beginning of their college experience may help them through their academic journey given personality has been found to be stable over the course of a lifetime, despite changes in the environment (Wilks, 2009).

### **Significance**

Since retention improvement is a priority at most universities, finding other factors that contribute to success in college could help increase retention numbers. Providing personality type indicator results to students early in their college academics may help students find success and prevent pursuits in a major not aligning with personality preferences. If a student is pursuing a major where their preferences are applied, they may be less likely to drop-out of college. Research on how assessments that identify career-related personality type indicators are used as a part of the college matriculation process or if they are valid instruments for this purpose is sparse. Yet, universities are paying for access to use such assessments to help students with major selection and career aspirations. The results of the assessments, if used for other purposes

in higher education, may lead to further improvements in retention and curriculum, but the effectiveness of using results for this purpose is yet unknown.

### **Purpose of Study**

The purpose of this study was to determine if a relationship exists between career-related personality type indicators (as indicated by the results on the DWYA), college matriculation, and completion in an Engineering degree program and/or overall academic college success for students at a four-year university who have participated in a Summer Bridge Program. Chi-square analyses were used for this study to better understand the relationship between student preferences that can apply in a work environment with both college matriculation and Engineering degree programs. The study was conducted at a four-year institution that hosts an annual Summer Bridge Program for incoming first-year college students.

### **Research Questions**

This study was guided by the following two research questions:

1. Is there a relationship between personality type indicator and college matriculation among Summer Bridge Participants?
2. Is there a relationship between personality type indicator, and program completion (i.e. engineering degree) among Summer Bridge Participants?

### **Definition of Terms**

The following terms are defined to provide the reader with an understanding of the variables in the study.

**College Matriculation:** the process of enrolling in college and fulfilling requirements to progress or graduate.

**“Do What You Are” (DWYA) assessment (1997):** A 36-item survey instrument based on the Myers-Briggs Type Indicator (MBTI) assessment which includes four dimensions: (a) Extraversion/Introversion (E/I); (b) Sensing/Intuition (S/N); Thinking/Feeling (T/F); and Judging/Perceiving (J/P). Results indicate individual preferences that can apply in a work environment.

**Myers-Briggs Type Indicator (MBTI):** A personality inventory based on Jung’s theory of psychological type designed to identify the basic personality preferences on each of the four dichotomies specified. The four dichotomous preferences are: introversion/extraversion, sensing/intuiting, thinking/feeling, and judging/perceiving. Personality types result from the combination of these four dichotomies (Myers, McCaulley, Quenk, & Hammer, 1998).

*Introversion (I):* An attitude or orientation of energy. Drawing energy from the environment and focusing inward (Myers et al, 1998).

*Extraversion (E):* An attitude or orientation of energy. Directing energy mainly toward the outer world of people and objects (Myers et al, 1998).

*Sensing (S):* Functions or processes of perception. Focusing mainly on what can be perceived by the five senses (Myers et al, 1998).

*Intuition (N):* Functions or processes of perception. Focusing mainly on perceiving patterns and interrelationships (Myers et al, 1998).

*Thinking (T):* Functions and processes of reasoning. Creating conclusions on logical analysis with a focus on objectivity and detachment (Myers et al, 1998).

*Feeling (F):* Functions and processes of reasoning. Creating conclusions on personal

and social values with a focus on understanding and harmony (Myers et al, 1998).

*Judging (J)*: Attitudes or orientations towards the outside world.

Preferring decisiveness and closure that result from handling the outer world using one of the judging processes (Myers et al, 1998).

*Perceiving (P)*: Attitudes or orientations towards the outside world.

Preferring the flexibility and spontaneity that results from handling the outer world using one of the perceiving processes (Myers et al, 1998).

**Personality**: typically defined as the sum of an individual's beliefs, perceptions, emotions, and attitudes and may be related to behavior aspects of an individual (Isaacson, & Brown, 2000).

**Personality Type Indicator**: Four-letter code displaying preferences for each of the four categories of the MBTI (and the DWYA): (E) Extraversion or (I) Introversion, (S) Sensing or (N) Intuition, (T) Thinking or (F) Feeling, and (J) Judging or (P) Perceiving. The four categories provide 16 possible combinations called personality types (e.g., ESTJ, INFP) (Myers, 1993).

**Personality Trait**: Sets of characteristics described in dimensions where two distinct differences are on opposite ends.

**Preferences**: individuals gravitate towards one side of each of the four personality scales developed and reported in the DWYA (and other MBTI-based assessments).

### **Limitations**

This study included participants from one institution's Summer Bridge Program. Although participants will represent multiple cohorts (2011-2018), all are from the same program offered at one institution. Other institutions may include different degree

programs and populations in their Summer Bridge programs allowing more variety for comparison. This study is limited to the multiple participants of one program over multiple years. Notably, there is limited data for the first few years of cohorts (2011-2013). Also, the instrument used in this study, the Do What You Are (DWYA) assessment, is a self-report and self-selection survey. Participant responses may or may not be true of themselves. As a result, answers may be skewed in a certain direction, leading to inaccurate results. The psychometric properties of the assessment are also limited by the lack of research evidence for measuring personality traits. Research has been conducted on whether the assessment provides results like the MBTI instrument, but not necessarily if outcomes match with personality traits. Further critiques of the assessment's validity and reliability are discussed in the following chapters.

### **Overview**

This study investigated the relationship between career-related personality type indicator results of incoming college students and their college matriculation. Further investigation examined degree completion of the participants and the relationship of their personality type indicator results. Chapter 2 presents a synthesis of previous research on college matriculation, personality theory, and personality indicators as described by the MBTI. Chapter 3 provides details of the methods used to study the relationship of career-related personality type indicator results and college matriculation for Summer Bridge participants. Chapter 4 covers the results of the chi-square analysis of each research question and their hypotheses. Lastly, Chapter 5 provides a summary of the results, limitations, implications and conclusion of the study.



## CHAPTER II

### REVIEW OF LITERATURE

The purpose of this study is to explore the relationship between career-related personality type indicator results and college student matriculation as well as degree completion. In this chapter, I present a review of the literature that includes an overview of college student matriculation, characteristics of college success, retention programming, personality theory, personal assessments, and use in college advising and career centers. This includes the current findings of the relationship of individual preferences and outcomes as well as the need for further study.

#### **College Student Matriculation**

Although college enrollment has increased, the number of college degrees awarded has not increased (Campbell, Jolly, Hoey, & Perlman, 2002). Those who have explored the disconnection from enrollment to graduation have found social factors (e.g., relationships with peers and instructors, family support) and individual factors (e.g., time management skills, study strategies) play a role in successful matriculation (Kelly, LaVergne, Boone, & Boone, 2012). For example, researchers at West Virginia University discovered family encouragement, positive relationships with professors, and positive course experiences encouraged student persistence in college, while burn out from school-related responsibilities, lack of time management skills, and the inability to handle

stress discouraged student persistence (Kelly et al., 2012). They determined it is the responsibility of universities to invest effort needed to ensure that students are achieving academic success and social correspondence (Kelly et al., 2012).

Despite efforts made by universities to retain students, many students still fail or leave college. Bean (1985) found college grades, institutional fit, and institutional commitment to be important predictors of *dropout syndrome*, which occurs when an individual leaves school for reasons unknown to the school system. Attending college entails socialization in an environment a student may not be familiar.

Nonacademic factors also play a role in college student success. Researchers have found that psychosocial factors contribute to first-year success and that addressing personal factors in academic advising increased success of first-year college students (Fowler & Boylan, 2010; Krumrei-Mancuso, Newton, Kim, & Wilcox, 2013). For example, the need for mental health services has risen on college campuses (Schwartz & Kay, 2009), as has the number of students needing help with meeting basic life needs, such as housing and food (Goldrick-Rab, Richardson, & Hernandez, 2017). Other investigations into first-year students and retention programming has found neither an increased familiarity with campus nor area of study appear to have a great impact on the likelihood of students ultimately succeeding in their studies (Cancado, Reisel, & Walker, 2018).

Positive relationships with teachers and positive school social organizations have also been shown to improve the likelihood that students matriculate. Creating a connection between students and university personnel, including tutors, builds a sense of caring and belonging, which can enhance student self-efficacy, confidence, and overall

ability in college (Laskey & Hetzel, 2011; Tinto, 1999). Having an individual who can provide information about college was important for first-generation rural students who attended an elite college (London, 1989). This evidence led to the development of college programming focused on student retention. Universities are developing programs such as living learning communities (LLC), mentoring, and tutoring to be proactive in preventing or troubleshooting areas proven to lead to college student failure.

### **Characteristics of College Success**

Personal factors that may predict college student retention include prior academic achievement, future educational goals, academic preparation, student involvement, and beliefs about college, as well as parental education, student age, and marital status. Living on campus as well as working part-time on campus has been shown to have positive effects (Astin, 1985). Astin (1985) also found a direct correlation between persistence and students with higher grades, better study habits, and a greater motivation for earning a degree. He recognized that students who had parents with a degree were more likely to earn a degree themselves. The more involvement a student has on campus the greater the likelihood of success and graduating (Sparkman, Maulding, & Roberts, 2009). Debt, medical issues, counseling needs, and family events are also common retention issues, regardless of individual characteristics (Liang, 2010).

**Admissions criteria.** Pre-college admission criteria, such as high school grade point average (GPA) and standardized exam scores (i.e., ACT, SAT) have been used to predict college success. However, research on the use of these criteria has led to mixed results. For example, Noble and Sawyer (2004) found both GPA and ACT are effective

predictors of first-year success in college; whereas Rothstein (2004) found no connection between graduation and scores on any section of the SAT.

Although the ACT and SAT entrance exams have been in place for college admission since the early 20th century, more recent research has concluded GPA is a better predictor of college success (Geiser & Santelices, 2007). Perhaps this is because achievement on the ACT exam can differ due to students' test taking ability, reading skill, and preparation (Laskey & Hetzel, 2011). Among African American students, the strongest predictor of test performance is age, whereas academic self-concept serves as a predictor of GPA (Awad, 2007). Historically, standardized admissions tests have been shown to have greater adverse impact than high school GPA on underrepresented minority students who disproportionately come from disadvantaged backgrounds (Geiser & Santelices, 2007). In a more recent study, Laskey and Hetzel (2011) found there was no significant difference in high school GPA or ACT score when retaining at-risk students. Thus, test scores and GPA may not be the best predictor of college success, particularly when considering student demographics.

While these admission requirements were implemented as a way to predict students most likely to succeed in college, student retention continues to be a challenge. Other areas must be explored in order to determine why students are not matriculating through college. Individual characteristics of students may be a contributing factor to success in college.

**Personal characteristics.** Individual attributes, such as ability and mindset, can contribute to whether a student fails or overcomes college-level coursework. Mindset is the inherent assumptions about flexibility of the dispositional factors that influence

human behavior (Dweck, 2006). When students interpret their lack of experience as lack of ability, that perception can lead to failure. If a student believes they are unintelligent and unable to learn, they are less likely to improve (Yeager & Dweck, 2012). Individual characteristics, such as mindset, developed overtime can condition how a student reacts to challenge.

Personal characteristics that have prevailed in the study of successful college students are self-efficacy, resilience, grit, and persistence. Bandura (2010) defined self-efficacy as the degree to which people believe they can perform. Self-efficacy has been associated with interest formation (Nauta, 2004). College self-efficacy may be an important variable in college students' persistence and their academic success (Wright, Jenkins-Guarnieri, & Murdock, 2013). The student's self-efficacy belief cultivates their performance. Involvement or practice produces performance, so those students involved in pre-engineering academies have been exposed to more principles of engineering than students without the same opportunity. Self-evaluation also helps form interests from the student's judgment of their own performance in an activity. This reflection builds drive for the selected subject area.

An emotional response to academic challenge that helps with self-development is considered resiliency (Yeager & Dweck, 2012). Resiliency can also occur socially through resolving and moving past conflict. When facing challenges, resilience may be the key for success. If students are taught intellectual abilities can be developed, they may be better equipped to face challenges and able to overcome obstacles. College coursework is purposely a higher level of learning and achievement, so when students are faced with new challenges some may react differently than others. Students who

experienced academic success prior to college can react negatively and feel a sense of failure when they do not achieve the same as they did in high school. Students who have sound self-efficacy and high personal standards academically may develop avoidance behaviors as a result of receiving a low grade when they are used to scoring higher. Their reaction to the low grade may further cause them to procrastinate or put forth less effort. When this occurs, it can become a downward spiral for the student. These students lack resilience of other students who matriculate through the system and graduate.

Another characteristic discussed with college student success is grit. Students with grit maintain passion for long-term goals and actively seek resources to support individual needs (Dumke, Tyndall, Naff, Crowder, & Cauley, 2018). Dumke and colleagues (2018) also found students with grit became resourceful when facing challenges. So, when these same students enter college and face difficulty in coursework, relationships, or finances, they are also the students who find solutions for their individual issues. Grit entails perseverance and passion in meeting goals. When students build interest in a subject area it builds passion and the likelihood of success. Those with more grit are also less likely to make as many career changes (Duckworth, Peterson, Matthews, & Kelly, 2007). Students with grit work strenuously, maintain interest, and are consistent with effort towards long-term goals despite any failure or adversity they face (Duckworth et al., 2007). Duckworth et al. (2007) also found undergraduates at an elite university who scored higher in grit earned higher GPAs than their peers, despite having lower SAT scores at college admission. Further investigations have determined GPA is a significant predictor of persistence in college (Stewart, Lim, & Kim, 2015). Those students with higher high school GPA and first semester college GPA tend to matriculate

beyond their first year of college. Washington, Pretlow, and Barnett's (2016) findings on programming, focused on college readiness, are consistent with those of other rigorously evaluated programs for developmental education students. Persistence in higher education is a multifaceted trait that cannot be solved with any implementation of one program (Washington, Pretlow, & Barnett, 2016).

### **Retention Programming**

Universities are discovering there is not a one-size-fits-all solution to retaining students. One misunderstanding by institutions is the idea that retention and graduation are one in the same. Siegel (2011) concluded the first year of college is the most critical year in retention. Implementation of freshman year programs in higher education is in direct response to a nationwide concern about decreasing rates of retention (Colton, Conner, Shultz, & Easter, 1999). Successful retention programs that have been implemented include learning communities (Dagley, Georgiopoulos, Reece, & Young, 2016; Purdie & Rosser, 2011), tutoring (Reinheimer & McKenzie, 2011), and orientations (Purdie & Rosser, 2011). However, Bean and Eaton (2001) believe the factors affecting retention are ultimately individual and that individual psychological processes (e.g., coping, personality, motivation) form the foundation for retention decisions.

Retention programs were developed over the last decade in hopes of improving retention of students and overall graduation numbers at institutions. Graduation numbers have increased as retention has increased, but not always at the same rate. One program in particular has been Summer Bridge Programming for incoming college freshmen students.

**Summer Bridge programs.** Retention of college students is an important consideration for higher education administrations. The academic journey to successful college graduation is one that has been investigated extensively. Programs such as the Summer Bridge Program are designed to bridge the gap from high school to college by educating students on a variety of topics, such as study skills, campus services, and how to handle financial aid. Programming also provides a cohort for students, which serves as a social support system, engaging students from underrepresented populations who may have lacked access to higher level science and math courses while in high school.

These programs help participants gain skills and knowledge prior to their first day of college classes and cover a variety of issues including academic and social adjustment. Some programs focus on special populations to enhance efforts to retain more students from underrepresented populations. Tomasko, Ridgway, Waller, and Olesik (2016) demonstrated that a summer STEM bridge program targeting populations underrepresented in STEM and first-generation college students could improve persistence to the third year in a STEM major. Growing occupational demands in science, technology, engineering, and math increases the need to retain students in these areas to fill roles after graduation. This need influences the demand to understand the factors that affect the persistence and retention of college students (Purnamasari, 2012). In particular, the demand for those from underrepresented populations has increased in industry, including STEM areas. It is even more important we discover what helps and hinders students pursuing these areas. Summer Bridge programs are intended to help students adjust to college. They target students from underrepresented populations, such as first-generation students and students from lower socioeconomic groups, as these are the



students that struggle most with attending and graduating from college (Smith & Miller, 2009). During most of these programs, particularly those that focus on STEM, the programming assists with remedial coursework, institutional services, and student's personal development. Yet not all students who complete programs go on to complete degrees in STEM and some do not complete degrees at all.

Research conducted on Summer Bridge Programs have shown that students who completed a Summer Bridge Program were more likely to end their freshman year with a higher GPA and return to school the following semester than their non-summer bridge peers (Allen & Bir, 2012). For engineering students specifically, another study revealed that Summer Bridge participants were retained in college at a rate similar to their fellow engineering peers who did not complete a Bridge program (Tomasko, Ridgway, Waller, & Olesik, 2016). Furthermore, engineering students who participated in a Summer Bridge Program were more likely to maintain their GPAs after their first year of college than other engineering students who did not attend a Bridge program (King, 2011). Participation in a Summer Bridge Program has also been shown to affect specific academic skills (e.g., use of technology, interpreting syllabus, note-taking, time management) and academic self-efficacy (Lonn, Aguilar, & Teasley, 2015; Strayhorn, 2011) positively.

Findings of other Summer Bridge programs have implied the importance of relationship building and socialization of students for success. For example, following a five-week summer bridge program, participants reported they had formed valuable friendships, developed feelings of security and confidence, and gained a greater sense of belonging at the institution (Lonn, Aguilar, & Teasley, 2015). A survey of other

participants revealed students believed interactions with faculty, staff, and peers was the most important factor in their success (Pritchard, Perazzo, Holt, Fishback, McLaughlin, Bankston, & Glazer, 2016).

In sum, one retention program that has grown in popularity, particularly among engineering colleges, is the Summer Bridge Program. Summer Bridge programs are precollege intervention, with a goal to increase retention and ultimately, college graduation rates. These programs target students who are from underrepresented populations or considered “at-risk” due to prior academic achievement. Limitations of these programs include the lack of investigation beyond the first year of college and lack of comparison to control groups when studied (Washington, Pretlow, & Barnett, 2016). Several programs have shown positive success despite the limitation of not studying long-term effects.

**At-risk students.** Traditional definitions of at-risk students include those that require remediation, particularly in the areas of math, writing, and reading (Laskey & Hetzel, 2011). When a student enters college requiring remedial coursework they are considered underprepared (Laskey & Hetzel, 2011). Students who are academically prepared for college coursework are more likely to be successful than those who require remedial coursework (Stewart, Lim, & Kim, 2015). Motivation may be an issue with this population because they do not understand the requirement and level of knowledge needed to do college coursework, as the lack of basic skill sets this population up for failure in college (Slavin, 1989). Positivity has been found in program initiatives helping college enrollment, but not graduation of at-risk students (Laskey & Hetzel, 2011).

Many studies on at-risk students focus on enrolling in college courses a semester instead of college matriculation, meaning they may be enrolling but not completing courses each semester moving closer to degree completion. For the Hispanic populations, their first language may not be English, which can hinder performance on admission exams. As previously noted, standardized test scores (e.g., ACT, SAT) have historically been used during the admissions decision process (Geiser & Santelices, 2007); however, some universities have reduced the weight such scores carry for minority students in the hopes that more students from these under-represented groups will attend college (Gandara & Lopez, 1998). Although this practice has led to minority students attending college in increasing numbers, it has also resulted in fewer students graduating from college (Gandara & Lopez, 1998).

Several factors may contribute to lower matriculation rates for students from minority populations. For example, one study revealed that Hispanic students with low SAT scores were more likely to perceive themselves as having lower academic ability than those who received higher scores and this result was determined independently of the student's GPA (Gandara & Lopez, 1998). Almost half of these students were aware of missed opportunities such as college admission or scholarships as a result of their scores. Although their exam scores were low, they still considered themselves unable to attend college even with a higher GPA that would allow admission. Self-confidence appears to be the issue with this population despite their performance being the same as their nonminority peers. It is possible there is communication to the minority populations such as the Hispanic and African-American students that the admission exam score is not important, but it is actually a main factor that determines a student's college admission.

The efforts made by institutions to help minority students attend college could actually be hindering them due to an unrealistic mindset.

Studies on African American college students have revealed feelings of isolation, non-acceptance, and rejection in predominantly white institutions (Davis, Dias-Bowie, Greenberg, Klukken, Poilio, Thomas, & Thompson, 2004; Feagin, Vera, & Imani, 2014). Furthermore, these students have faced barriers such as racism, alienation, and discrimination when seeking financial aid for schooling (Lett & Wright, 2003). African-American students may select college courses outside of their intended major and drop difficult classes when they become challenging (Kemp, 1990). By following this pattern, they risk not meeting degree requirements and may ultimately fail to graduate.

Universities have responded to higher attrition in minority populations with the creation of programs aimed towards these students. Studies have found minority students who complete college preparation programs are more likely to persist in college when compared to their minority counterparts who did not complete a program (Knaggs, Sondergeld, & Schardt, 2015). Minority students may be as motivated as White students, but when faced with unfamiliar situations they may act in ways that impede their academic progress. Failing a course may lead a student to believe they have failed college and lead to a decision to drop out. Whereas, if they were educated to realize that classmates before them had retaken classes after failure and eventually graduated, they may also believe they can achieve the same outcome. Special programs may overlook these behaviors because they focus on remedial coursework.

STEM majors who are also first-generation college students face more obstacles than other non-first-generation students (Dika & D'Amico, 2016). First-generation

students have been defined as “undergraduates whose parents never enrolled in postsecondary education” (NCES, 1998, p. 82). Students who are a part of the description of first-generation are known to have more struggles in higher education because of the lack of knowledge about the higher education system. In addition, first generation students tend to have lower than average grades and are more likely to need remediation (Chen & Carroll, 2005). Unfortunately, Pulley (2008) has noted as little as 10% of students who take remedial coursework persist through college. Taken together, these findings suggest first generation students struggle to make it to degree completion and college graduation.

Students tend to have the outlook that if they are not succeeding or thriving, they should quit. Many of the students drop coursework as a solution to not meeting requirements of the course. They struggle to understand they can retake coursework or seek tutoring for assistance. College student services works to help students and, over time, the role of this office on campus has evolved to provide programming beyond enrollment support. First generation students should not be expected to progress without assistance due to their lack of knowledge about procedures, as those can be learned from an academic advisor. This small action can help a student focus on academic learning and less on the other obstacles in higher education. Research shows when first-generation students are provided with support that includes how to navigate higher education they complete coursework and earn a degree (Chen & Carroll, 2005). When advisors are communicating with students during hard semesters, focusing on campus resources or other personal issues may not push students through academic challenges (Dumke, Tyndall, Naff, Crowder, & Cauley, 2018). Advisors assist students with developing a

self-transcendent view of coursework and its purpose, as well as the student's overall future plan to help increase motivation and persevere through difficult times (Dumke et al., 2018). Self-transcendent view means to develop a positive outlook on expanding boundaries and personal potential (Yeager, Henderson, Paunesku, Walton, D'Mello, Spitzer, & Duckworth, 2014). Summer Bridge Programs allow relationships with academic advisors to begin sooner, which could contribute further to overall success.

The lack of preparation rural students have received in high school may be due to challenges they faced, such as low-performing secondary schools, lack of precedence in attending college, and limited technology connectivity (Scott, Miller, & Morris, 2016). Such factors can contribute to poor college preparation and a lack of basic information about financial aid to attend college. Some students from rural areas do not have home computers let alone access to internet at home. Most of these students are often first-generation college students as well. Other studies have not found a relationship to first-generation classifications and college barriers in rural students (Scott, Miller, & Morris, 2016).

In recent days, college demographics are changing, with more female students attending postsecondary schooling due to higher academic performance, social relationships, and frequency of discussion with high school counselors (Riegle-Crumb, 2010). Summer Bridge programming has been designed to help overcome challenges this new population may face. It is designed to target populations with a history of less college success and provide a better foundation for college success of students who complete the program. From the gathered research, one program indicated the MBTI was included in the program. However, the research on how such results are used and the

degree to which they support student matriculation in college remains sparse. Further study is needed to determine if the results of such assessments is warranted and/or might help students identify a pathway to success.

### **Personality Trait Theory**

Psychologists have studied personality and determined traits. These are meaningful differences in patterns of behavior, thought, and emotions among individuals. Traits are not deemed good or bad, and are influenced by culture and an individual's environment. Goals, values, and beliefs condition traits as well. Individual preferences can be identified by behavioral patterns found in people (Myers, 1993). Carl Jung (1875-1961), one of the first psychologists to investigate the individual differences in behaviors, identified distinct Psychological Types based on personal preferences and traits that develop throughout life. Jung (2016) referred to these preferences as attitudes and functions. According to Jung, *attitudes* are determined by influences from the external or internal world, which he labeled as either *Introversion* or *Extraversion*. By contrast, *functions* refer to the preferences individuals have for how they perceive and interpret information, which he labeled as either *Intuition* or *Sensing*, as well as how they make decisions based on that information, which he labeled as either *Thinking* or *Feeling*.

Traits are sometimes described on dimensions where two distinct differences are on opposite ends. When individuals take a personality-type indicator assessment, their results will fall somewhere between the two differences on each dimension. Applying Jung's personality type theory, similarities are discovered through analyzing individual choices, gaining insight to their personal preferences. Some individuals will indicate a strong preference towards one or the other, others may fall in the middle of the two. For

example, introversion and extraversion can be two opposite ends of a dimension. An individual may indicate a stronger preference to one over the other after completing a personality type indicator assessment. If one prefers thoughts and ideas, they draw from the internal environment (introversion) whereas preferences for people and things in the external environment are related to extraversion. Individuals who prefer to view experiences as complex interactions, sometimes applying theory to their perceptions, with an inclination to develop new ideas never applied before are those with results in *Intuition* (N) whereas individuals who prefer more concrete ideas and practicality, rely on what has worked in the past when solving problems and perceive things are factual when observable by the senses are those with results in *Sensing* (S). When making decisions, an individual with results in *Thinking* (T) applies logic and tends to be more analytical whereas those with results in *Feeling* (F) reflects on personal values and rationalization.

A simple career-related personality type indicator assessment at the beginning of a student's college academics could provide them with more information about themselves, setting them up for success in their chosen major. As part of a conversation with a college advisor or professional, this insight may prevent academic failure and college dropout of students, potentially increasing college retention of students as well. After learning their result, the individual may take the information to determine opportunities that allow use of their natural preferences.

### **Personality Assessments**

Several personality assessments have been developed to assist psychologists with diagnosis and the development of interventions. Among these assessments include the Big 5 Personality Test, the Minnesota Multiphasic Personality Inventory (MMPI), and



the California Psychological Inventory (CPI). Such assessments require specialized training for administration and interpretation of results, so employers often rely on self-report surveys, such as the Myers-Briggs Type Indicator (MBTI). As this study aligns with industry use, it will use results from the Do What You Are (DWYA) assessment, which was based on the MBTI. Peer-reviewed research is scarce on the DWYA, so this review will focus on the empirical literature related to the MBTI.

Based on Jung's theory, Katherine Briggs and her daughter, Isabell Briggs Myers developed an instrument called the Myers-Briggs Type Indicator (The Myers & Briggs Foundation; Myers, McCaulley, Quenk, & Hammer, 1998). Starting with the same three categories Jung had identified (i.e., Introversion/Extraversion, Sensing/Intuition, Thinking/Feeling), they added a fourth category related to how people prefer to structure their lives, known as *Judging* or *Perceiving*, which reflects how a person prefers to use time and how much time they believe is needed when making decisions. Individuals with a personality-type indicator result of *Judging* (J) tend to be planners who are more organized and stay on task, while those with a result of *Perceiving* (P) tend to prefer keeping their options open without making a decision, which can delay their ability to manage their time and maintain focus. Myers and Briggs-Myers also took a different approach to the Introversion/Extraversion scale by focusing on behavior instead of the internal world as Jung originally theorized.

Through a forced choice, self-report questionnaire, the MBTI provides individuals with a four-letter result; one letter indicating their preference on each of the four areas described (Table 2.1). For example, an individual who completed the assessment with preferences indicating qualities reflected in the dimensions of extraversion, sensing,

feeling, and judging would have the result ESFJ. Thus, the MBTI is an assessment that evaluates individual preferences. The final, four-letter result indicates a personality type, as determined by a preference for statements indicating one category over another (i.e., Introversion/Extraversion, Intuition/Sensing, Feeling/Thinking, and Judging/Perceiving).

Table 2.1.

*Four Dimensions Measured by the MBTI (Myers, 1993)*

Extraversion (E) Prefers talking and doing; Outgoing	Introversion (I) Prefers listening and reflecting; Reserved
Sensing (S) Focus on present realities, attention to detail, past experiences, practical, factual	Intuition (N) Focus on possibilities, imagination, inventive, abstract, “big picture”
Thinking (T) Focuses on analytical reasoning	Feeling (F) Focuses on personal values and empathy
Judging (J) Prefers planning, structure, punctual	Perceiving (P) Prefers to be flexible, casual, spontaneous

Although assessments that help identify these personality type indicators have been implemented in industry, human resources, and training departments, as well as in higher education to assist career professionals, there is limited research establishing personality type indicators as a valid instrument for such use. Katherine Briggs and Isabell Briggs Myers were not psychologists, nor did they have training in psychometrics. Their work established personality type indicators based on patterns of the types they created and the areas of their participants’ professions. Researchers have found the MBTI to be a psychometrically stable instrument when comparing groups of people by their result (Levy, Murphy, & Rae, 1972).

## **The Relationship between Personality-type Indicators and Outcomes**

**Certain indicators are more prominent in certain fields.** Career theories assume individuals engage both exploration of self and the environments prior to making choices about major and career and therefore, individual differences related to people's career choices are relevant to career exploratory activities (Nauta, 2007). Larson, Wu, Bailey, Gasser, Bonitz, and Borgen, (2010) hypothesized that personality, combined with confidence and interests would significantly differentiate between college majors. When dividing majors into families, some preferences are more prominent discriminators than others, such as positive emotionality relating to elementary education majors instead of engineering majors (Larson et al., 2010).

In one study, students majoring in music were studied for patterns in personality-type indicators as measured by the MBTI (Phillips, 1997). The results showed that although all students were more likely to have results indicating they were high on the sensing, thinking, and judging dimensions, students seeking a Bachelor of Music degree were more likely to score high on introversion (final results being ISTJ), while those seeking a degree in Music Education were more likely to score high in extraversion (ESTJ) (Phillips, 1997). One could theorize that individuals with a personality type indicator of extraversion would gravitate towards teaching, as that profession inherently requires active engagement with others, whereas those with a personality type indicator of introversion may be more inclined to produce music, something that can be more solitary in nature. Similarly, a comparison study on teachers indicated the most likely profile results to be ISFJ (Introversion, Sensing, Feeling, Judging) (Rushton, Morgan, & Richard, 2007). These researchers believed the results of Sensing (S) and Judging (J)

reflected individuals who preferred to be more realistic, factual, detailed, and organized (Rushton et al., 2007), all relevant preferences for the role of educator.

Results from another study investigating students who majored in Art revealed those majoring in Fine Art and Art Education were more likely to have an MBTI result of Intuition (N) than Sensing (S) (Stephens, 1973). Given the Intuition/Sensing dimension relates to how individuals prefer to view experiences and ideas, it makes sense that those who are in a creative field such as art would indicate preferences for developing new ideas, imagination, and possibilities (i.e., Intuition) over present realities (i.e., Sensing). Furthermore, those majoring in Art Education and Occupational Therapy more often had a result of Feeling (F) than Thinking (T) (Stephens, 1973). If a result of Feeling (F) reflects a preference to base decisions on personal values over logic and analytical reasoning, then this result is reasonable given these two majors prepare students to work directly with people by either teaching or helping heal them. Such differences may have reflected a larger trend in terms of student population differences, as students who attended college were more likely to have a result of Intuition (N) and those in vocational and technical training programs were more likely to have a result of Sensing (S) (Stephens, 1973). As this data is over four decades old, and the student population is now more diverse (Seemiller & Grace, 2016), further study of how personality-type indicators relate to college major is warranted.

Another study by Reynolds, Adams, Ferguson, and Leidig (2016) looked into computing careers and MBTI results finding there is a significant difference in personality-type indicators among computing majors (computer science and information systems), specifically in the area of Introversion (I) versus Extraversion (E), and Intuition

(N) versus Sensing (S). Information systems majors were found to mostly have results of Extraversion (E), Sensing (S), and Thinking (T). Another related study by Sendall, Peslak, Ceccucci, and Kruck, (2015) on information systems majors looked into management information systems (MIS), computer information systems (CIS), and business information systems (BIS) majors, and found BIS students had results in Extraversion (E) while CIS majors had results in Introversion (I). MIS students were found to have both Introversion (I) and Extraversion (E) results. Introversion and Extraversion is how people interact in the world. Each of these majors would have a work environment that would reflect interaction with others and their environment. The CIS majors had results in Introversion (I) and these individuals focus on the inward and their work environment would likely involve projects that were individual than group and that is where individuals with these results would thrive. Extraversion is the opposite in nature and the BIS majors were found to have more results in this area. The business side of the work environment would involve more interaction with other individuals and potentially teamwork. Those with results in extraversion work well in this environment. These majors are technical in nature. The content of coursework would be similar to engineering and as this study found there were differences or preferences between majors of the same industry.

McCaulley (1974) found that participants studying engineering had results indicating Thinking (T) and Judging (J) preferences. When looking at industry, those that worked in software engineering were more likely to have results that indicated preferences for Thinking (T) and Judging (J) over Feeling (F) and Perceiving (P) (Sach, Petre, & Sharp, 2010). The nature of the work would relate to preference outcomes since

those environments would benefit from quick decision-making such as those who have results of Thinking (T) and Judging (J). Those individuals with results in Thinking (T) prefer analysis and those with results of Judging prefer structure, both would be fulfilled in software engineering due to the nature of the work involving coding, problem solving, and individual decision making.

**Individuals with certain indicator results perform better on certain tasks.**

Those in industry have found the MBTI to be helpful in understanding decision making in others as well as themselves (McCarthy & Garavan, 1999). This understanding has motivated change in the workplace and fostered teamwork because individuals had better understanding of themselves as well as others. Assessing individual strengths and weaknesses leads to enhancing self-awareness (McCarthy & Garavan, 1999). Knowing their strengths and weaknesses could help students gain friendships, teams, and relationships with others earlier.

If personality type assessment results reflect differences in the way people choose to approach learning, using the results from an instrument such as the MBTI could help students understand their academic strengths, weaknesses, and motivations. Such knowledge of self could lead to enhanced personal development and better decisions related to a college major and career (Fralick, 2011). When a person can acknowledge personal weaknesses, they can avoid certain circumstances or kinds of work that places them in a situation where they are forced to use their lesser functions. By doing so, they gravitate towards areas that come easier where they can create flow. When an individual finds their flow state, they operate and perform by being fully immersed and focused (Csikszentmihalyi, 1997). In turn, this creates enjoyment for the area by the individual.

Those who ascribe to personality trait theory would suggest that certain personality characteristics (which creates different personality types) are related to success in some areas, while other characteristics might be related to success in other areas (Schurr & Ruble, 1986). For example, personality type contributes to how students learn, manage their time, and communicate with others who may be different from themselves (Fralick, 2011).

Concerning math measures, the performance of those with a result of Introversion (I) exceeded the performance of those with a result of Extraversion (E), and the performance of those with the result of Intuition (N) exceeded the performance of those with a result of Sensing (S) (Schurr & Ruble, 1986). Findings also suggest that results on the Judging and Perceiving (J/P) scale is most relevant to personality characteristics often associated with college instructors' evaluation of achievement, as individuals who have results of Perceiving (P) do not perform as well academically as those who have results of Judging (J) (Schurr, & Ruble, 1986). As mentioned above, a result of Perceiving (P) indicates a preference for taking more time for decision making. As college is very structured and additional time may not be available, those that have such a preference may be limited in their academic performance due to the lack of additional time to make decisions. Overall, the MBTI results that relate most to college major is the Judging/Perceiving (J/P) dimension (Van, 1992).

When looking at specific areas of discipline, those with results of Extraversion (E) and Sensing (S) tend to do comparatively better in speech, journalism, communication, and political science courses, while those with results of Intuition (N) do better in astronomy-physics, psychological science, biology, and natural resources

courses (Schurr & Ruble, 1986). Chang and Chang (2000) have also reported those with results of Intuition (N) and Thinking (T) are largely represented in science and engineering fields. They noted the bulk of students' grades were based on their performance in the classroom that was over hands-on experience. Over half of Chang and Chang's study sample were students with results of Sensing (S) and Judging (J), revealing the disconnection of theory and experiment grades in students since those with Sensing (S) results would traditionally perform better in experiments than lecture from the classroom.

In another study, Felder, Felder, and Dietz (2002) found students with results of Thinking (T) outperformed those students with results of Feeling (F) in engineering curriculum. Those with results of Intuition (N) also outperformed those with results of Sensing (S) in courses with abstract content. As discussed earlier, those with results in Intuition (N) are more theoretical in nature, while those with results in Sensing (S) prefer more concrete experiences. The results also support previous research that students with Sensing (S) results struggle with the theoretical coursework of engineering (Chang & Chang, 2000). The new information gained from their study was the fact the students with results in Extraversion, Sensing and Feeling (ESF) had improved performance with experimental instruction compared to previous studies where students with results in these areas did not perform well in engineering (Felder et al., 2002). As the latter two studies (Chang & Chang, 2000; Felder et al. 2002) were conducted nearly two decades later than the one conducted by Schurr and Ruble (1986), a shift in instructional course design may be providing different types of support for the different types of students now enrolling in engineering programs.



**Individuals with certain indicator results prefer certain tasks.** A study almost 40 years ago looked into the preferences of college students at that time (Lam, 1980). Notably, only 22% of students from rural high school had results of Intuition (N), while a majority of Ivy League freshmen (59%) and National Merit finalists (82%) had this same result. Although this information is from 1980, the information implies results in Intuition (N) influences academic performance. Those with results in Intuition (N) are said to be better test takers, have better writing skills, and enjoy reading (Lam, 1980). At the time of the study, those with results in Intuition(N) were outnumbered in the population. Those that had results in Introversion (I) and Intuition (N) were viewed by others as most “academic” out of all the results. Those with Intuition (N) results like the concepts and ideas of theory, abstract, and complexity. A significant portion of college classrooms are based and constructed on such ideas and indicate students with Intuition (N) results perform better in college. Liang’s (2010) study on medical students found the greatest commonality to be Intuition (N). As a result, Intuition (N) indicates a preference on “why,” students with this result may be more interested in college coursework that is more theoretical in nature. By contrast, Lam (1980) found those pursuing health professions were more likely to have Sensing (S) and Thinking (T) results, while those studying electrical engineering were more likely to have results of Introversion, Thinking, and Judging (ITJ). When focusing on those with results in Sensing (S) verses Intuition (N), Lam reported those in the general population are more likely to have results of Sensing (S) over Intuition (N).

Students will have different expectations about coursework in college. Felder, Felder, and Dietz (2002) discovered students with different results on personality type

indicator assessments, such as the MBTI, tend to respond differently to alternative methods of instruction. Those with results in Extraversion (E) tend to like working in groups and those in Introversion (I) preferred working alone. Individuals with results in Sensing (S) tend to prefer learning experiences with concrete ideas and clearly defined expectations and dislike instruction with theory and math models; whereas those with results in Intuition (N) like instruction that emphasizes conceptual understanding such as theory and downplays repetition and memorization of facts (Felder et al., 2002). Individuals with Thinking (T) results prefer course presentations to be logically organized with the course material and have feedback of their work products; individuals with Feeling (F) results gravitate towards instructors who establish a personal bond with the student and have feedback provided that expresses appreciation of their efforts. Those with Judging (J) results like well-structured instruction with clearly defined responsibilities; those with Perceiving (P) results like to have time to make a choice and appreciate flexibility in assignments and dislike having to follow inflexible timelines (Felder et al., 2002).

Previous research has looked into specific majors, first year success, or class grades using the MBTI to investigate retention of students. However, limited research has been conducted on student matriculation through college and graduation correlating to their career-related personality assessment result. Knowing the relationship between the career-related personality assessment results, college major, and graduation could be helpful in understanding where else they could also contribute. Since research is limited on the relationship between college success and career related assessments and retention

efforts are high at universities, exploring these relationships could contribute to college student success and help meet the industry need and demands.

### **The Need for Further Study**

#### **Changing Demographics**

Due to changes in who is attending college, what used to be prominent (as measured by the MBTI) may no longer be true. As high schools are focusing on making all students college-ready, the instruction that worked for a more homogenous population may no longer be working. This trend, along with the growing need to fulfill occupations in the STEM industry has increased discussion on pursuing college majors and working in STEM. Researchers suggest that STEM experiences interact with demographic variables to inspire, reinforce, or prepare interest in STEM, such as female students who take physics during high school are more likely to declare a STEM college major (Bottia, Steams, Michelson, Moller, & Parker, 2015). Other researchers have concluded women and some minority students may have learning differences (Salter, Evans, & Forney, 2006). Although Chang and Chang's (2000) study consisted mostly of male participants, they concluded the addition of the MBTI provided an additional analytical dimension when studying students and the learning environment.

#### **Gender and Ethnicity**

When exploring differences in people, researchers have theorized there is not enough dimensional difference to capture ethnic differences in personality using assessments such as the MBTI (Borg & Shapiro, 1996). Following an investigation of college freshmen, researchers determined there was more difference found in gender than ethnicity (Borg & Stranahan, 2002). For example, African American males were found to

mostly have results of Extraversion, Sensing, Thinking, and Judging (ESTJ) whereas African American females were shown to more often have results of Introversion and Intuition (INTJ) (Levy, Murphy, & Rae, 1972). However, in another study that was major specific, African American students majoring in information systems were more often found to have results of Introversion (I) and Intuition (N), while White students were more likely to have results of Sensing (S) and Judging (J) (McPherson & Mensch, 2007), indicating results for the major may not be dominate for any dimension. When examining culture and gender in personality type indicator assessments, significance has not been found (Levy, Murphy, & Rae, 1972; Thomas, 2005). The assessment may be best used a tool to help university professionals assist all college students without focusing on gender or ethnicity.

Rosati (1993) also observed that students with Introversion, Thinking, and Judging (ITJ) results were more likely to graduate in engineering after four years than those with Extraversion, Feeling, and Perceiving (EFP) results, but Sensing (S) results were more likely than those in Intuition (N) (Rosati, 1993). The Intuition (N) and Sensing (S) dimension has mostly determined students with Intuition (N) results perform better in college; however, the results only applied to male students. Schurr's (1986) conclusions found that students with Introversion (I) and Intuition (N) results had more academic aptitude whereas students who also had a Judging (J) result performed better than their Perceiving (P) result peers in their orientation program. The MBTI results associated with college academic success are Introversion (I), Intuition (N), and Judging (J); while those with results of Introversion (I), Intuition (N), Thinking (T), and Judging (J) (INTJ) were

more likely to achieve academically during their first year of an engineering program (Schurr, 1986; Rosati, 1993).

### **Criticism of the MBTI**

The MBTI is known to be one of the most widely used personality inventories in occupational and commercial settings, although there is criticism of assessments by academic units (Moyle & Hackston, 2017). Researchers have also indicated the MBTI should not be used as a selection instrument even when used with other indicators during the hiring process (Schurr & Ruble, 1986). Although the assessment can be misused in attempting to indicate job performance or compatibility, it is also important to point out patterns of previous use of career-related personality type indicators revealing certain types may be attracted to certain occupations if commonalities have been found between preferences and occupations (Tieger, & Barron-Tieger, 1995). The MBTI proposes that people use all categories explained in the assessment, but prefer one over the other, similarly to how some people prefer to write right-handed over left, but are capable of learning to use the opposite hand. The energy it takes to call on one preference over the other determines which is the preferred. When an individual has to draw on the energy to fulfill a role that is not natural for them it can cause a variety of physical human responses such as anxiety, stress, and depression (Langer & Ngnoumen, 2017). In summary, when a student pursues a major where they must draw more energy to achieve requirements, it could cause difficulty for the student and lead to failure in classes and potentially dropping out of college.

The popularity of the MBTI is likely due to the self-awareness of the assessment. The Barnum effect has been used to describe the outcome of the MBTI when used in a

military setting. The Barnum effect suggests individuals find personal meaning in descriptions that can be applied to a large amount of people (Gerras & Wong, 2016). “Because the MBTI’s descriptions are vague and general, there is a tendency to view the personal feedback as highly accurate even though the descriptions that could apply to just about anybody’ (Gerras & Wong, 2016, p.55). Although the DWYA may also be susceptible to the Barnum effect the assessment results are used in higher education environments and career centers to help students.

### **Use by College/Career Counseling Centers**

The association of career-related personality assessment type and college major has limited research. College admission professionals and possible employers can use results to get to know an applicant when they may not have a chance to meet the applicant before accepting them into their institution or workplace through examining their personality type indicator results (Gill, 2010). This practice could also contribute to retention efforts and degree completion by providing better advising by college professionals. College counseling and career centers may promote retention by helping identify students that may be at higher risk of poor academic performance or attrition based on career and personality type indicator assessment results (Kahn, Nauta, Gailbreath, Tipps, & Chartrand, 2002). Schneider (1987) believed personality and interest tests should be used for identifying the types of people who cluster in different organizations. This same idea could be applied to college major selection when trying to make a decision between certain majors. Allowing students to complete personality type inventories before starting a specific major, allows institutions to provide better advising

during major selection by the students (Reynolds, Adams, Ferguson, & Leidig, 2016), while increasing retention, coursework satisfaction and degree completion.

When applied to college academic advising, those who ascribe to personality type theory would propose that results on a measure such as the MBTI or career-related personality assessment could prove useful. This information helps with guiding students on their academic paths as well as their college advisors in providing this guidance. “Helping students understand type theory and the differences among people can allow them to focus on developing strategies for academic success” (Moore, Dietz, & Jenkins, 1998, p.196). Not all research using personality type indicator assessments has proven to be helpful with guiding college students. Other studies on major selection and personality type indicators have found lack of evidence in helping (e.g., Pulver & Kelly, 2008). A study by Pulver and Kelly (2008) found the Strong Interest Inventory was more likely to predict general work-related theme scales in 45.4% of cases. When Strong Interest and MBTI were joined and analyzed, the success rate was 48.3%, revealing that this combination was not a significantly higher predictor than the Strong Interest Inventory alone. The low percentage could make one question if the results from personality-type indicator assessments are helpful in advising students, but with so few studies it is difficult to determine.

### **Summary**

The MBTI has been used as a predictor of college student graduation rates at one university (Schurr, Ruble, Palomba, Pickerill, & Moore, 1997), but the same relationship was not as definite at another university (Kalsbeek, 1987). Theorists and researchers have investigated individual traits such as self-efficacy and the relationship with college

students and major selection. This chapter included discussion of college matriculation, personality trait theory, summer bridge participants, and application by college advisors. Considering most of the research on personality type indicators and college matriculation is over 20 years old, one should ask whether the increase in number of students and the increasingly diverse population of students attending college has led to the influx of STEM demand and education as well as the desire for more diversity in the workplace. The answer to retain students may possibly be in career-related personality-type indicator results of college students.



## CHAPTER III

### METHODOLOGY

The purpose of this study was to examine the college matriculation and degree completion of Summer Bridge program participants and the relationship of personality type indicators. For this study, I analyzed relationships between career-related personality type indicator results of the Do What You Are (DWYA) assessment and matriculation through college, as well as completion of the engineering program, for Summer Bridge participants at one University from 2011-2018.

#### **Research Questions**

For the purpose of this study, two research questions were explored:

##### **Research Question 1**

Is there a relationship between personality type indicator and college matriculation among Summer Bridge participants?

**Hypotheses.** Previous research indicated the traditional college students of 30+ years ago most often had results of Intuition (N) and Judging (J) (Lam, 1980). As this research is over three decades old and many high schools are now preparing all students for college upon graduation, the college population of today is likely to have more variety in personality type indicator results.

H1: Participants with the result of Introversion (I) are equally likely to matriculate through college as those with the results of Extraversion (E). Thus, I predicted the null hypothesis for this dimension would be retained.

H2: Participants with the result of Intuition (N) are more likely to matriculate through college than those with a result of Sensing (S).

H3: Participants with the result of Thinking (T) are more likely to matriculate through college than those with a result of Feeling (F).

H4: Participants with the result of Judging (J) are more likely to matriculate through college than those with a result of Perceiving (P).

**Rationale.** As there is limited research using the “Do What You Are” (DWYA) assessment, for this study, I was relying on literature related to the MBTI (that provides the foundation for the DWYA assessment) to base my hypotheses. Reviewed literature provided evidence there is a connection between particular college majors and results of personality-type indicator assessments, such as the MBTI. Even though previous research has indicated a relationship between students’ chosen college major and whether they have results of Introversion (I) or Extraversion (E), there is no research that indicates one is more likely to graduate from college. Students may gravitate toward one major over another due to the occupational outcomes and nature of future jobs. For instance, teachers were more likely to have results of Extraversion (E) and Feeling (F) on the MBTI (Rushton, Morgan, & Richard, 2007) and art education majors were more likely to have results of feeling (F) (Stephens, 1973). Literature has indicated a history of those who had results of intuition (N) as the students in college and also graduating with degrees (Lam, 1980). Results of this study could also reveal if those who had results of Intuition (N)

were still the dominate population attending college and enrolled in engineering programs.

Previous research has also indicated that those individuals who indicate Thinking (T) preferences are also likely to succeed in engineering majors, but little research has indicated this to be true for overall college success (Chang & Chang, 2000). The nature of those who had Judging (J) results has been explained as being very structured, and those who are structured are also perceived as having the ability to time management. However, one can ask if those with results in Perceiving (P) are also completing engineering programs or matriculating through college. As mentioned above, those with results in Perceiving (P) tend to take more time on their decision making, which is not always the best characteristic for success in college due to assignment deadlines. Schurr and Ruble (1986) found those who had results of Perceiving (P) do not perform as well academically as individuals with results in Judging (J), supporting hypothesis 4. Since the Stephens (1973) study was over 40 years ago, and the population of college and college academics has likely changed, it was worth investigating if this was still true.

## **Research Question 2**

Is there a relationship between personality type indicator and program completion (i.e. engineering degree) among Summer Bridge participants?

**Hypotheses.** Literature findings have indicated there are individual factors that contribute to college success. However, these investigations have not been studied in Summer Bridge program participants, nor has research explored engineering discipline success and personality type indicator results. This study explored results from a career-related personality type indicator assessment and success in engineering programs of

Summer Bridge participants. The following are the anticipated results of this investigation:

H5: Participants with results of Introversion (I) are more likely to be successful in engineering programs than those with results of Extraversion (E).

H6: Participants with results of Intuition (N) are more likely to be successful in engineering programs than those with results of Sensing (S).

H7: Participants with results of Thinking (T) are more likely to be successful in engineering programs than those with results of Feeling (F).

H8: Participants with results of Judging (J) are more likely to be successful in engineering programs than those with results of Perceiving (P).

**Rationale.** As discussed in Chapter 2, studies that looked at math measures showed the performance of those who have results as Introversion (I) exceed performance of those with results of Extraversion (E) (Schurr & Ruble, 1986) and individuals with results of Intuition (N) exceed performance of those with results of Sensing (S) (Schurr & Ruble, 1986). Math is heavy and abundant in the engineering curriculum. According to this outcome, those who have results of Extraversion (E) and Sensing (S) were perceived to be less prepared for college achievement in math, while those with results of Introversion (I) and Intuition (N) were perceived as better prepared academically (Schurr & Ruble, 1986). When looking at specific disciplines, those with results of Extraversion (E) and Sensing (S) tend to do comparatively better in speech, journalism, communication, and political science courses, while those with results in Intuition (N) did better in astronomy-physics, psychological science, biology, and natural resources courses (Schurr & Ruble, 1986). Chang and Chang (2000) said those who

received results in Intuition (N) and Thinking (T) are largely represented in science and engineering fields. Van (1992) found the strongest indicator associated with college academic success to be the dimension of Judging (J) and Perceiving (P), with individuals with results of Judging (J) showing more success. McCaulley (1974) also found students studying engineering to have results of Thinking (T) and Judging (J).

### **Sample and Population**

The subjects for the survey were undergraduate students at a large, four-year institution located in the Midwest who completed the University’s Summer Bridge Program between 2011-2018. All participants ( $N = 343$ ) would have declared a major in either engineering or architecture and attended the Summer Bridge Program prior to the fall semester of their freshman year (Table 3.1). Graduation and enrollment records for these students were collected as of the 2019-2020 academic year.

Table 3.1

*Summer Bridge Participant Total and DWYA results by Year*

Year	Participants	DWYA Results
2011	16	4
2012	17	1
2013	32	11
2014	56	49
2015	86	79
2016	73	64
2017	49	47
2018	94	88
Totals	423	343

## Instrument

The Internet-based, career-related, personality-type indicator assessment known as Do What You Are (DWYA) was administered to student participants during their time in the Summer Bridge Program. The DWYA is similar to the MBTI in that it helps identify personality type preferences, which DWYA developers define as the innate way people naturally see the world and make decisions, reflecting a set of basic drives and motivations that remain constant throughout a person's life (Miller, 2007). Like the MBTI, this assessment provides individuals with a four-letter result (e.g. ISTJ, ENFP) indicating an individual's preferences for each of the following: Extraversion and Introversion (E/I), relating to how people interact with the world and where they get their energy; Sensing and Intuition (S/N), the kind of information people naturally notice and remember; Thinking and Feeling (T/F), relating to decision making; and Judging and Perceiving (J/P), relating to timing and if they prefer structure or spontaneity. An important difference between the DWYA and the MBTI, however, is that the DWYA asks students to choose which of two scenarios sounds most like them rather than selecting "yes" or "no" for each statement. For example, a student taking this assessment would be presented with the following two scenarios and told to select the one that is most like them:

At lunch, I usually sit and talk with other people, and I belong to several clubs – because I like the social interaction. If given a choice, I prefer to do homework with others, and I often chat with my friends while I'm working.

I have excellent powers of concentration and usually prefer to study alone. My interests are complex and intense – like I am – and I know a lot about the things that interest me. I enjoy having a meaningful conversation, but dislike superficial chit-chat.

(Humanesources.com, 2020)

As shown in this example, the choices would be considered equally valuable opposites rather than a choice between right and wrong or good and bad. As the DWYA assessment was designed for use with students, these scenarios are often situated within a more formal learning context. The assessment provides results similar to the MBTI, meaning results of the MBTI are often similar to the results of the DWYA (Ehlers, 2008), with individuals receiving a four-letter result (e.g. ISTJ, ENFP), which indicates the individual's preferences as applied to a work environment.

Another difference between the MBTI and the DWYA is the number of questions included in each instrument. The MBTI has 93 questions and the DWYA has 36, much less than the MBTI. Another difference between the MBTI and the DWYA assessment is the requirements by the administrator. The MBTI requires a certification training to administer and interpret the results. The DWYA can be administered by an educator, counselor, or human resources professional (Human eSources, 2013).

**Reliability.** The DWYA has mostly been used on student populations under the age of 20 years old. The MBTI participants have spread across a general population of a variety of ages (18+). When reviewed by Human eSources (2018), the DWYA was found to have stable psychometric properties. Analyses of internal consistency on each dimension revealed all dimensions have “acceptable” (.70-.79) or “good” (.80-.89) reliability, with an average coefficient alpha of 0.84 (Human eSources, 2013): 0.85 (I/E); 0.78 (S/N); 0.84 (T/F); and 0.87 (J/P). When studied, participants of the assessment were asked to pick a description without seeing their results and on average 50% selected their same type description and most felt the result was a good fit for them (Human eSources, 2018).

The threshold for the DWYA is more rigorous than what has been used for the MBTI. This means the weakest items of the DWYA are closer to the MBTI standard (Human eSources, 2013). Stein and Swan (2019) believe the MBTI theory falters on theoretical criteria and lacks facts and data, testability, and has internal contradictions. Internal consistency is questioned through the assessment's content that asks the participant to self-verify results (Stein & Swan, 2019). The self-verify component of the assessment causes a battle between use and practice. Some psychologists and researchers question the reliability of the instrument causing the outlook on the instrument to be negative. In practice, professionals use the assessments in order to assist students through discussion of results.

**Validity.** Item analysis has been conducted to conclude all items in the assessment have predictive power for their intention (Human eSources, 2013). Predictive power is the ability to anticipate an outcome based on pattern. This means the items were predicting the dimension intended and not one of the other three dimensions. Items are predictive if both choices have at least a 0.66 probability to predict preferences (Human eSources, 2013). When testing the validity of the instrument, validity has been determined in the preference scales (e.g., Introversion vs. Extraversion), each pair of letters as dichotomies, and the combination of preferences for each type (The Myers & Briggs Foundation, 2020). When reviewed by Human eSources (2018), the DWYA was comparable to the MBTI in the validity test examining fit, meaning participants of the assessment agreed their results were a good fit for them when asked. In a study of 35,478 individuals' results, 93% of participants responded they felt their results were mostly or very accurate (Human eSources, 2013). Furthermore, when asked to pick a description



without seeing their results, 50% of participants selected their same type description (Human eSources, 2018). These results are comparable to those of MBTI (Human eSources, 2013).

Instruments such as the DWYA and the MBTI that indicate one of 16 various personality combinations have been questioned. Other studies have shown good evidence for construct validity through exploratory and confirmatory factor analyses (The Myers & Briggs Foundation, 2020), with a four-factor model providing the best fit and aligning with Isabel Briggs Myers's original, hypothesized model (Van Zyl & Taylor, 2012).

### **Procedure**

Prior to conducting the study, permission was requested from Oklahoma State University's Institutional Review Board (Appendix A) to conduct the research for this study. Following IRB approval, I collected college matriculation records for the identified student population from the campus Registrar and DWYA assessment results from the departmental office responsible for the Summer Bridge program. Summer Bridge participants completed the assessment in their own time and brought the results to a career coordinator for discussion while completing their designated program per year. Results were documented by a career coordinator. Minimal notes were documented about discussion of the results with the participant.

### **Data Collection**

As shown in Table 3.1 above, most participants of the Summer Bridge program between 2014-2018 completed the DWYA assessment during their time in the program. Assessment results were documented by the career professional and compiled in a Microsoft Excel spreadsheet for each year. Table 3.2 below, displays the breakdown of

the sample used between research question 1 and research question 2. Current enrollment records were collected from the Office of the Registrar at the University to determine if Summer Bridge participants with DWYA results ( $N = 343$ ) were enrolled or had graduated (categorized as yes) or no longer enrolled (categorized as no). Participants who had graduated were also included in the matriculation data as they are perceived to have successfully matriculated. Analysis was further conducted for research question 2 by separating the graduates with DWYA results ( $n = 72$ ) and identifying whether they had graduated from engineering or another degree at the University (not engineering).

Table 3.2

*Participants with DWYA Results by Matriculation and Graduate Status*

Year	Matriculation ( $N = 343$ )		Graduates ( $n = 72$ )	
	Yes	No	Engineering	Not Engineering
2011	3	1	3	
2012	1		1	
2013	7	4	4	3
2014	34	15	23	5
2015	56	24	26	6
2016	48	15		1
2017	39	8		
2018	67	21		
Totals	255	88	57	15

**Data Analysis**

Student scores on the DWYA served as chief independent variable for the outcome variable. Scores were presented as dichotomous scores (E or I, S or N, T or F, and J or P). These strategies were intended to answer the two research questions:

1. Is there a relationship between personality type indicator and college matriculation among Summer Bridge participants?
2. Is there a relationship between personality type indicator and program completion (i.e. engineering degree) among Summer Bridge participants?

To investigate all hypotheses, I used SPSS statistical analysis software to conduct Chi-squared tests with DWYA results and matriculation. In addition, Chi-squared analyses were used to test DWYA results and engineering degree completion.

## CHAPTER IV

### RESULTS

The purpose of this study was to determine if a relationship exists between career-related personality type indicators (as indicated by the results on the DWYA), college matriculation, and completion of an Engineering degree program and/or other program for students at a four-year university who have participated in a Summer Bridge Program. The following research questions were addressed:

1. Is there a relationship between personality type indicator and college matriculation among Summer Bridge Participants?
2. Is there a relationship between personality type indicator and program completion (i.e. engineering degree) among Summer Bridge Participants?

#### **Descriptive Statistics**

In total, the study examined 343 participants for the college matriculation question (research question 1) and 72 participants that had graduated from the university for research question 2. As shown in Table 4.1, participants were predominately White males who did not identify as a first-generation college student. The target population of this study were Summer Bridge participants at one institution. Summer Bridge programs were established to help with the transition from high school to college for underrepresented populations. The sample of this study is limited by the lack of diversity

and may not be the best representation of an underrepresented population. Because the study focused on a specific population (Summer Bridge participants), further descriptive data are not reported.

Table 4.1

*Demographics of Sample*

	Matriculation ( <i>N</i> = 343)	Graduates ( <i>n</i> = 72)
<b>Gender</b>		
Male	258	44
Female	85	28
<b>Ethnicity</b>		
White	214	38
Black	28	5
Hispanic	24	5
Asian	10	2
Native American	11	4
Bi-racial	56	18
<b>First-Generation Status</b>		
Yes	43	8
No	233	25
Unknown	67	39

**Results of Chi-Square Analyses**

Chi-squared tests were conducted to determine the relationship between personality type indicator results and college matriculation as well as program completion in this study. A chi-square test of independence was conducted because all variables were categorical. In order for the hypothesis to be supported, the chi-square must be statistically significant and the proportion must be in the specified direction stated in the hypothesis. Alpha was set at .05 for each hypothesis. Output of all data analyses have been included in Appendix B.

## Research Question 1

The first research question investigated if there was a relationship between personality type indicator and college matriculation among Summer Bridge Participants. The count of students within each personality dimension and within matriculation are presented in Table 4.2.

**Hypothesis 1.** The first hypothesis was that participants with the result of Introversion (I) are equally likely to matriculate through college as those with the results of Extraversion (E). Thus, I predicted the null hypothesis for this dimension would be retained. Chi-Square was not statistically significant  $\chi^2(1, N = 343) = 0.032, p = .858$ , meaning a relationship did not exist between results of Introversion/Extraversion and college matriculation. There was no difference found between those with results of Introversion/Extraversion and matriculation through college. Thus, the null hypothesis was retained, as predicted.

**Hypotheses 2.** The second hypothesis was that participants with the result of Intuition (N) are more likely to matriculate through college than those with a result of Sensing (S). A chi-square test of independence examining the relationship between N/S results and matriculation was statistically significant  $\chi^2(1, N = 343) = 3.928, p = .047$ . As shown in Table 4.2, individuals with a result of Sensing (S) were more likely to matriculate than those with results of Intuition (N). Thus, Hypotheses 2 was not supported.

**Hypothesis 3.** The third hypothesis was that participants with the result of Thinking (T) are more likely to matriculate through college than those with a result of Feeling (F). A chi-square test of independence was not statistically significant  $\chi^2(1, N =$

343) = 2.046,  $p = .153$ , meaning a relationship did not exist among results of Thinking/Feeling and matriculation. Thus, Hypothesis 3 was not supported.

**Hypothesis 4.** The fourth hypothesis was that participants with the result of Judging (J) are more likely to matriculate through college than those with a result of Perceiving (P). A chi-square test of independence was statistically significant  $\chi^2(1, N = 343) = 3.873, p = .049$ , meaning a relationship existed, with individuals who had a result of Judging (J) more likely to matriculate through college than those with a result of Perceiving (P), as predicted (see Table 4.2). Thus, Hypothesis 4 was supported.

Table 4.2

*Chi-square Tests of Independence for Hypotheses 1-4 (N = 343)*

Hypothesis	Dimension/Result	Matriculation		$\chi^2$	p-value
		Yes	No		
1	I	139	47	0.032	0.858
	E	116	41		
2	N	94	43	3.928	0.047
	S	161	45		
3	T	183	56	2.046	0.153
	F	72	32		
4	J	169	48	3.873	0.049
	P	86	40		

### **Research Question 2**

Chi-squared tests were conducted to determine the relationship between personality type indicator and program completion for research question 2 in this study. In order for the hypothesis to be supported, the chi-square must be statistically significant, and the proportion must be in the specified direction stated in the hypothesis. All data is reported in Table 4.3.

**Hypothesis 5.** The fifth hypothesis was that participants with results of Introversion (I) are more likely to complete the engineering programs than those with results of Extraversion (E). The Chi-Square test was not statistically significant  $\chi^2(1, n = 72) = .541, p = .462$ . The lack of significance indicates there is no difference. Thus, Hypotheses 5 was not supported.

**Hypothesis 6.** The sixth hypothesis was that participants with results of Intuition (N) are more likely to complete the engineering programs than those with results of Sensing (S). The Chi-square test was statistically significant,  $\chi^2(1, n = 72) = 5.485, p = .019$ , meaning the proportions are different and a relationship existed among the variables of the N/S dimension and success in engineering programs. There were more participants with results of Sensing (S) than Intuition (N) who graduated from engineering program for the studied population (see Table 4.3). Although I had predicted there would be a relationship, my hypothesis was that those with results of Intuition (I) would be more likely to graduate; thus, Hypothesis 6 was not supported.

**Hypothesis 7.** The seventh hypothesis was that participants with results of Thinking (T) are more likely to be successful in engineering programs than those with results of Feeling (F). There was a violation of the chi square assumption that one cell had an expected count that was less than 5 (those who graduated with degrees outside of engineering). Fisher's Exact Test indicated a value of .206, which was not significant, indicating there was no relationship between a result of Feeling (F) or Thinking (T) and successful completion in engineering program. Thus, the null hypothesis was retained, and Hypothesis 7 was not supported.



**Hypothesis 8.** The eighth hypothesis was that participants with results of Judging (J) are more likely to be successful in engineering programs than those with results of Perceiving (P). There was a violation of the chi square assumption that one cell had an expected count that was less than 5 (those who graduated with degrees outside of engineering). Fisher’s Exact Test indicated a value of .346, which was not significant, indicating there was no relationship between a result of Judging (J) or Perceiving (P) and successful completion in engineering program. Thus, the null hypothesis was retained, and Hypothesis 8 was not supported.

Table 4.3

*Chi-square Tests of Independence for Hypotheses 5-8 (n = 72)*

Hypothesis	Dimension/Result	Graduate		$\chi^2$	p-value
		Engineering	Other Degree		
5	I	32	10	0.541	0.462
	E	25	5		
6	N	19	10	5.485	0.019
	S	38	5		
7	T	42	8	2.318	0.206
	F	15	7		
8	J	42	9	1.076	0.346
	P	15	6		

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose of the study was to determine if a relationship existed between career-related personality type indicators (as indicated by the results on the DWYA) and college matriculation or completion of an Engineering degree program for students at a four-year university who have participated in a Summer Bridge Program. A quantitative approach was utilized for this study to understand better the relationship between student preferences that can apply in a work environment with both college matriculation and Engineering degree programs. The study was conducted at a four-year institution that hosts an annual Summer Bridge Program for incoming first-year college students declaring an engineering major. Research questions included:

1. Is there a relationship between personality type indicator and college matriculation among Summer Bridge Participants?
2. Is there a relationship between personality type indicator, and program completion (i.e. engineering degree) among Summer Bridge Participants?

#### **Summary**

Participants of the study included 343 Summer Bridge participants from programs completed 2011-2018 who had results on the DWYA. All 343 participants were used to explore the first research question about college matriculation, as those that were enrolled

or had successfully graduated were considered to be matriculating while those who were no longer enrolled were not matriculating. After completing chi-square analyses, results on the Sensing/Intuition (S/N) and Judging/Perceiving (J/P) dimensions of the DWYA assessment were shown to have a relationship with college matriculation among these Summer Bridge program participants. Those with results of Sensing (S) and Judging (J) were more likely to matriculate (i.e., enrolled or graduated vs. not enrolled at the university) than those with results of Intuition (N) or Perceiving (P). Among the 343 participants, there were 72 participants that had completed degree programs and graduated from the university. These 72 participants were used to explore the second research question about program completion. After conducting additional chi-square analyses, results showed the Sensing/Intuition (S/N) dimension of the DWYA assessment had a relationship to program completion (i.e. engineering degree vs. other degree): those with results of Sensing (S) were more likely to graduate from engineering programs than those with results of Intuition (N).

### **Personality Type Indicator and College Matriculation**

The matriculation of college students has been studied in recent years. Previous research has distinguished areas of focus to help students be successful in college. This study investigated if career-related, personality-type indicator results have a relationship with college matriculation among Summer Bridge participants. The results indicate a relationship between the dimension of Sensing/Intuition (S/N) as well as Judging/Perceiving (J/P) and college matriculation.

Individuals who prefer to view experiences as complex interactions, sometimes applying theory to their perceptions, with an inclination to develop new ideas never

applied before are those with results in *Intuition* (N) whereas individuals who prefer more concrete ideas and practicality, rely on what has worked in the past when solving problems, and perceive things are factual when observable by the senses are those with results in *Sensing* (S). More students are attending college post high school graduation and are being educated to be ready for college coursework by national standards (Marcus, 2018). Given the general population has had more individuals with results of sensing (Weilier, Keller, & Olex, 2012; Lam 1980) and today, there are more students going to college, it makes sense that there would now be more students with a result of Sensing on college campuses than in the past. This study confirms there are currently students with a result of Sensing (S) on college campuses who are finding ways to matriculate successfully through college. However, given this study's sample included only students who started in engineering/architecture program and participated in Summer Bridge programming, generalizability to the broader college population is limited. Still, one could question what has contributed to the increase and achievement of students with a result of Sensing (S) in college since previous literature does not support the claim. Previous studies have suggested changes in teaching methods and classrooms, as well as flexibility in time, to accommodate students who do not naturally fit the traditional classroom and academic structure (Kariippanon, Lancaster, Okely, & Parrish, 2019). As the previous studies are dated, we can question if some adjustments have been made to the college environment and coursework. For example, the opportunity students received during Summer Bridge program to learn about resources on campus could have contributed to their success in college. Although the data collected did not indicate whether students may have transferred to other programs, it is possible students are

finding alternative pathways for matriculation and that some programs are making better accommodations than others for students with the Sensing (S) preference. Further research is needed to determine whether such adjustments are happening more broadly across campus.

Findings also revealed students in this study with results of Judging (J) are more successfully matriculating through college compared to their peers with results of Perceiving (P). Again, it is worth noting this sample does not represent college students broadly, but rather students who initially started college in a Summer Bridge program for engineering/architecture students and may or may not have transferred to another program on campus. Schurr and Ruble (1986) found the Judging and Perceiving (J/P) scale to be most relevant to personality characteristics associated with coursework success, as individuals in their study who had results of Perceiving (P) did not perform as well academically as those with results of Judging (J). This current study provides further evidence that supports the outcome of individuals with results of Judging (J) are outperforming individuals with results of Perceiving (P) when defined by continued enrollment in college coursework or graduation from a program. Similar to Schurr and Ruble's (1986) study, the dimension of Judging(J)/Perceiving(P) might be the most manageable preference by students, as individuals have the ability to develop time management skills. According to the DWYA, those with results of Perceiving (P) lack a natural preference to organize and manage time. Thus, the responsibility of developing better skills in these areas would fall on individuals with the Perceiving (P) type result. Although these students may fall short in time management skills, previous literature has

found the individuals with Perceiving (P) results to be as academically capable as those with Judging (J) result (Schurr & Ruble, 1986).

Although results on the Intuition/Sensing and Judging/Perceiving dimensions were significant, results on the Extraversion/Introversion and Feeling/Thinking dimensions were not. After statistical analysis, results indicated there was not a significant relationship between the Extraversion (E)/Introversion (I) dimension and matriculation through college for these students. The resources available to students on a college campus are numerous and continue to grow with each new need. I expected the outcome would not be significant because I believe both sides of the dimension (E and I) are using their resources on campus to be successful. That is, those with results in Introversion (I) can use the Internet to search for answers when they have an academic problem. Likewise, those with results in Extraversion (E) may be asking other people for help with problems faced during their academics. This means neither preference is at a disadvantage given the resources currently available to students at college. The students in this study all started college in an engineering/architecture program and participated in a Summer Bridge program, where they were exposed to such campus resources. Thus, even if they did not matriculate through the engineering program successfully, they may have been better prepared to matriculate through college in general. This is a benefit of the Summer Bridge Program rather than an individual trait or preference.

It was also hypothesized that those with results of Thinking (T) would be more likely to matriculate through college over those with results of Feeling (F). After statistical analysis, this was shown not to be statistically significant for the population studied. There are a few ideas that may contribute to this outcome. Since this dimension

relates to decision making, this dimension may not be a strong contributor to college matriculation. It may, however, contribute to student's decision on major selection or occupational industry selection. Those individuals with results in Thinking (T) may enjoy environments that are logical and consistent (Myers, 1993). Those with results in Feeling (F) may appreciate values and harmony (Myers, 1993). Thus, this dimension may have more impact on job responsibilities and work environment to meet preferences. Again, the population used for this study started in an engineering/architecture program and completed Summer Bridge Programming. Students may have transferred to another program. The programs the students changed to may be better suited for their preferences. Further investigation would be needed to determine if this is the case.

### **Personality Type Indicator and Program Completion**

Although previous literature revealed those individuals with Intuition (N) results performed better in math (Lam, 1980), this current study found that individuals with Sensing (S) results are more likely to graduate from an engineering program than individuals with Intuition (N) results. This current study not only reveals there are those with Sensing (S) results on college campuses that are matriculating through college, they are also graduating from an engineering program. Again, it is worth noting that this sample was not representative of all students on a college campus, as it included only those who had participated in a Summer Bridge program for students initially in the engineering/architecture program. However, these students with a result of Sensing (S) not only were more likely to matriculate (and possibly changed programs to succeed), but were also more likely to graduate from the engineering/architecture program. One could question if the students who may be more inclined to attend a Summer Bridge program

are also those with Sensing (S) results because previous literature has suggested those with Intuition (N) preferred results are better test-takers, have better writing skills, and enjoy reading (Lam, 1980). Although this is a possibility for the results of the study, it reveals students with the Sensing (S) result are graduating from an engineering program despite the lack in natural academic preferences as prior research has shown they typically do not connect as well as those with Intuition (N) results to the theoretical content of a college-lecture type classroom.

Lam (1980) reported those in the general population as individuals with results of Sensing (S) over Intuition (N). National standards have been adjusted to achieve high school graduation requiring students to be educated at a level that is ready for college and this has led more students to attend college. Since more of the general population are said to have results of Sensing (Lam, 1980), it is also likely there are more students that have personality-type indicator results of Sensing (S) attending college. As mentioned above, adjustments to the college environment and coursework may contribute to the results of this study and why more individuals with Sensing (S) results are graduating from engineering programs. Another revelation revealed in this study was that not only were there more individuals with Sensing (S) results matriculating, many have graduated with Engineering degrees. A previous study determined those who had results of Intuition (N) performed better in the engineering classroom, while those with results of Sensing (S) performed better in hands-on activities such as lab components rather than the traditional lecture classroom with theoretical content (Chang & Chang, 2000). As a result of this current study, we may wonder if more hands-on activities and lab components have been added to the engineering classroom and individuals with Sensing (S) results are naturally



connecting and achieving in coursework. In a recent study by Emami, Bazzocchi and Hakima, (2019), engineering design assessments were found to be best performed by those with results that were a combination of Sensing (S) and Judging (J). The concrete experience and practical application can relate to the preferences of those with results in Sensing (S).

Although results indicated a significant relationship between results on the Sensing (S)/ Intuition (N) dimension and program completion/graduation, results on the other three dimensions indicated no such relationship. Previous research had indicated those with results in Introversion (I) were more likely to graduate with an engineering degree (Lam, 1980), thus this current study predicted the same outcome. After statistical analysis, it was revealed there was no significance. As explained above with the Extraversion (E) and Introversion (I) dimension, students have different types of resources available that align with the different preferences of each. Resources on a college campus may help explain this outcome. If college students are having trouble academically, they may be seeking help through campus resources, however they may be approaching those resources by asking questions of others (Extraversion) or searching the internet (Introversion). Either way may be successful. The underlying issue is receiving help to problems. Knowing when to ask for help may be part of the issue. As mentioned in Chapter 2, there are personality traits that have been proven to contribute to college success such as grit, perseverance and resiliency. As these traits are not revealed through the results of DWYA, it is difficult to determine among the population studied who may have these successful traits.

There was also no significant relationship between results on the dimension of Feeling (F) and Thinking (T) and program completion for these Summer Bridge participants. Traditionally, from previous studies, those that had results of Thinking (T) were more likely to succeed in engineering (Felder et. al, 2002; McCaulley, 1974; Lam, 1980; Sach, et. al, 2010). Thus, the hypothesis for this current study was based on this previous research, given the population studied entered college with the intentions of studying engineering. After further investigation, I noted the other areas of completion included accounting, aviation, biology, business, chemistry, finance, and political science. Those participants with results in Feeling (F) may also be discovering areas where they can fulfill their desire of harmony and values in the engineering field, possibly through pursuing medical school to become a doctor and care for others. The medical environment would possibly be a more suitable fit for those with results in Feeling (F) since their preference involves caring about people. Also, due to the involvement of technology and the internet, college students are more exposed to world issues. Engineering could be perceived as a problem-solving discipline. Those that have results in Feeling (F) may have developed the preference to work towards solving a world issue such as providing clean water through building water filtration systems in a third world country knowing that work would impact people and create harmony. Thus, the dimension of Thinking (T) and Feeling (F) may have equal opportunity to complete engineering degree.

The last hypothesis investigated the relationship of the Judging (J) and Perceiving (P) and program completion among Summer Bridge participants. Previous studies have indicated those with results in Judging (J) were more likely to be successful in

engineering, but only (Schurr & Ruble, 1986) study revealed those with results in Judging (J) have college success. After statistical analysis, this was also found to not be significant. Considering there was significance found among all the participants of the study for the Judging (J) and Perceiving (P) dimension for matriculation, one could question if the fewer number of graduates contributes to the lack of significance for program completion. There was a violation of statistical assumptions due to the number of participants for each category (Judging and Perceiving), which may have contributed to this outcome. A larger sample may reveal different results. Also, among the previous studies reviewed for the current study, researchers focused on performance in a particular area, such as engineering, and not necessarily graduation in any degree program (Chang & Chang, 2000; Felder et. al, 2002; Lam, 1980; Schurr & Ruble, 1986). This may also contribute to the lack of evidence that those with results in Judging (J) are more likely completing engineering degree programs than those with results in Perceiving (P).

### **Limitations**

There are limitations to the present study. One pertains to the criticism of the instrument (DWYA). The other consideration relates to the sample of the study.

#### **Criticism of the DWYA**

The instrument used in this study is the Do What You Are (DWYA). Although, several institutions offer such assessments through career services centers to help students select a major or future career, very limited research has been conducted using the DWYA at the college or higher education level. As mentioned previously, human resource departments and career service centers use MBTI-like assessments in practice, although there is limited evidence related to the validity and reliability of the instrument.

Psychologists particularly point out the shortfalls of the instrument and criticize the instrument's lack of evaluation of personality traits (Stein & Swan, 2019). This can particularly relate to the use of the instrument. The DWYA does not require a certification by professionals to discuss results with a consumer, as the MBTI does. Although analysis has revealed the DWYA to be reliable in providing similar if not the same results as the MBTI would provide to a participant, the use of the information provided is subjective to the discussion that occurs between the professional and consumer. Furthermore, the validity is also in question because it is a self-report questionnaire. People may respond differently each time they complete the assessment, and this effects the result they receive upon. If the participant responded to each question the same each time they completed the assessment they likely would get the same result, and this would provide reliability. Also, since questions are designed to select one option over the other option this does not provide a continuous score as other psychological instruments. Lastly, these personality indicators exist on a continuum, but the results are reported as categorical, meaning those who receive results favoring one aspect of the dimension over the other may just meet the criteria for each category. Scale-level data would reveal the strength of each indicator on the DWYA assessment. If this information had been available, analyses may have revealed further significant relationships.

The DWYA assessment is a self-report and self-selection survey. Participant responses may or may not be factual of the participants because they may have guessed, lied, or rushed through the assessment questions when completing it. Answers may be skewed and provide inaccurate results for the study population. As discussed previously, the psychometric properties of the DWYA assessment are also limited by the lack of

research evidence for measuring personality traits. Certain cautions due to the use of the instrument can be expressed because of those who are unfamiliar with Myers-Briggs Type Indicator assessments. This can cause possible misinterpretation of the assessment results.

### **Sample**

The sample for this study included Summer Bridge Program participants from one higher education institution. When the participants completed the DWYA assessment, the participants were incoming freshmen students who had declared engineering as their college major. Summer Bridge programs typically limit the number of participants each year, so the total number of participants in this study was also limited. Although this study used multiple years of participants, the total was small, particularly in number of graduates for the second research question, which contributed to violations of assumptions when conducting chi-square statistical analyses. A larger sample may have different results. Also, this sample was disproportionate by gender: there were more male participants. There may be certain behaviors displayed by men or women that are more socially accepted by one over the other. For instance, aggression may be more accepted as a male trait over a female trait, as caring and nurturing may be more accepted as a female trait over a male trait. If a student of the opposing gender displays one of these traits, they may be perceived negatively by their peers or instructors, which could affect the success of the individual in any of their academic pursuits.

Also, since this study used participant results from multiple years, a continuous score is not available, only the final four-letter type result provided by the assessment completed by each participant. If a numerical score were available, more robust analyses

could have been conducted but, all the data is categorical, which only allowed for the use of nonparametric statistics. Having numerical data for each of the personality type indicator assessment results would allow for regression analysis, that could reveal a predictive relationship between variables, a more robust analysis with less probability of error.

### **Implications**

Although the study has limitations, there are also implications for practice and future research.

### **Recommendations for Practice**

College professionals may explore students' personality-type indicators at the beginning of the students' college careers to help them navigate through their academic journey. If students were required to complete a career-related personality assessment after college admission or at the beginning of their college career the results could not only be used by career professionals, but instructors in the classroom similar to the study by Chang & Chang (2000). As this current study revealed significance in both matriculation and completion in the dimension of Sensing (S) and Intuition (N), it could provide value. The DWYA results could be an instrument used by educators to better prepare the classroom for students. The results of the current study suggest that looking at trends in these data could inform instructors on how they might refine their instruction to better align with student preferences such as, classroom activities with concrete ideas over theory in lecture to relate more to those students that are Sensing (S) preferred and prefer concrete ideas and challenging the students that are Intuition (N) preferred by placing them outside of their natural preference.

Finally, it is worth acknowledging how cost may factor into the decision to use assessments. Several assessments require a fee to the participant or organization for use of the product. The DWYA used in the current study is a free assessment for student participants at this university. The MBTI assessment is also available at the same institution, but there is a charge to the student to complete the assessment. Since the MBTI and related personality-type indicator assessments are used in industry, there may be opportunity to partner with organizations. The partnership could serve as a connection between higher education and industry through student preferences revealed in the assessment results and how those preferences can serve companies. This partnership also provides opportunity to further increase student occupants for the occupational demand of STEM areas by matching student preferences.

### **Recommendations for Future Research**

As mentioned, previous literature has reported students with Perceiving (P) results to be as academically capable as their counterparts with Judging (J) results (Schurr & Ruble, 1986). In this study, I did not explore academic ability or test scores of the population studied, but previous studies have explored ACT/SAT scores and coursework grades. Results have shown variety among the dimensions of MBTI assessment results and academic performance. While this current study did not find many significant differences, if the variables were not categorical (Yes/No) but rather scaled (GPA, ACT/SAT score), analyses may have revealed a further relationship between variables. Future research might explore academic performance of college students including GPA or ACT/SAT scores and the relationship of their career-related personality type indicator results.

Thirty years ago, Schurr and colleagues (1988) stated more students were interested in business fields over science and humanities when entering college. Present day, there is an increased demand of Science, Technology, Engineering, and Math (STEM) occupations that has led to more students pursuing STEM majors in college. Career-related, personality type indicator results may be helpful when making vocational decisions. Future research might consider investigating personality type indicator results and STEM major students. The present study focused mostly on Engineering majors and those who entered college with intention of studying engineering. Exploring other majors such as science, technology and math, as it relates to career-related personality type preferences may reveal more on student success in these areas.

The present study is one of its own kind because it examines longevity of Summer Bridge participants. Significant portion of studies focus on first-year success when conducting research on Summer Bridge populations. The increase in first-generation and multi-cultural students attending college will likely increase number of summer bridge participants in the future, particularly if such programs continue to target these populations. Continued research should examine the success of summer bridge participants to graduation, not only in Engineering, but other degree programs.

Finally, the participants of the present study were provided consultation of the career-related personality-type indicator results during their time in Summer Bridge, but the content of the conversation was not recorded or provided. Future researchers may investigate the implications of the consultation and if it influenced major change earlier in a student's college academic career. Personality-type indicator assessments are based on a person's natural preferences. The relationship between personality type preferences



and college success changes as students select majors that are more in line with their natural preferences (Schurr & Ruble, 1986).

### **Conclusion**

College student retention has been a hot topic on many college campuses over the past decade. Higher education administrations have searched for ways to retain more students on their campus. One area that has not been highly investigated are career-related personality-type indicator assessment results and their relationship with college matriculation and graduation. This study explored this relationship and significance for future use and contribution were achieved. Significance was found in the dimension of Sensing(S)/Intuition(N) of the Do What You Are (DWYA) assessment for both matriculation and program completion for the Summer Bridge program participants population of this study. Further evidence was found in the dimension of Judging(J)/Perceiving(P) that contributed and supported earlier claims of college achievement that those with results of Judging (J) matriculate through college.

Although personality type indicator assessments are used in industry, they may not be the best instrument due to the lack of validity and reliability of the instrument. Previous research has revealed there are traits of student's personality that lead to college success such as grit, perseverance, and resiliency. These traits are not directly revealed with the results of the DWYA assessment. College student retention is a priority at most higher education institutions. While college graduation rates are not reflecting the same as college student enrollment, there may be areas yet explored to help with this issue. The results of this current study explore personality type indicators and college

matriculation/program completion and may provide further evidence to contribute to college student retention.

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## APPENDIX A



### Oklahoma State University Institutional Review Board

Date: 01/15/2020  
Application Number: ED-19-167  
Proposal Title: The Relationship between personality type indicators and college matriculation of summer bridge participants.

Principal Investigator: Andrea Haken  
Co-Investigator(s):  
Faculty Adviser: Jane S Vogler, Ph.D.  
Project Coordinator:  
Research Assistant(s):

Processed as: Exempt  
Exempt Category:

#### **Status Recommended by Reviewer(s): Approved**

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

**This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.**

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or [irb@okstate.edu](mailto:irb@okstate.edu).

Sincerely,  
Oklahoma State University IRB

APPENDIX B

*Chi-Square Test for E/I and College Matriculation*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.032 <sup>a</sup>	1	.858		
Continuity Correction <sup>b</sup>	.003	1	.956		
Likelihood Ratio	.032	1	.858		
Fisher's Exact Test				.902	.478
N of Valid Cases	343				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 40.28.

b. Computed only for a 2x2 table

*Chi-Square Test for S/N and College Matriculation*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.928 <sup>a</sup>	1	.047		
Continuity Correction <sup>b</sup>	3.444	1	.064		
Likelihood Ratio	3.882	1	.049		
Fisher's Exact Test				.058	.032
N of Valid Cases	343				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 35.15.

b. Computed only for a 2x2 table

*Chi-Square Test for T/F and College Matriculation*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.046 <sup>a</sup>	1	.153		
Continuity Correction <sup>b</sup>	1.679	1	.195		
Likelihood Ratio	2.003	1	.157		
Fisher's Exact Test				.179	.098
N of Valid Cases	343				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.68.

b. Computed only for a 2x2 table

*Chi-Square Test for J/P and College Matriculation*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.873 <sup>a</sup>	1	.049		
Continuity Correction <sup>b</sup>	3.384	1	.066		
Likelihood Ratio	3.808	1	.051		
Fisher's Exact Test				.055	.034
N of Valid Cases	343				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 32.33.

b. Computed only for a 2x2 table

*Chi-Square Test for E/I and Program Completion*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.541 <sup>a</sup>	1	.462		
Continuity Correction <sup>b</sup>	.195	1	.659		
Likelihood Ratio	.551	1	.458		
Fisher's Exact Test				.563	.333
N of Valid Cases	72				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.25.

b. Computed only for a 2x2 table

*Chi-Square Test for S/N and Program Completion*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.485 <sup>a</sup>	1	.019		
Continuity Correction <sup>b</sup>	4.187	1	.041		
Likelihood Ratio	5.416	1	.020		
Fisher's Exact Test				.036	.021
N of Valid Cases	72				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.04.

b. Computed only for a 2x2 table

*Chi-Square Test for T/F and Program Completion*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.318 <sup>a</sup>	1	.128		
Continuity Correction <sup>b</sup>	1.458	1	.227		
Likelihood Ratio	2.202	1	.138		
Fisher's Exact Test				.206	.115
N of Valid Cases	72				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.58.

b. Computed only for a 2x2 table

*Chi-Square Test for J/P and Program Completion*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.076 <sup>a</sup>	1	.300		
Continuity Correction <sup>b</sup>	.516	1	.473		
Likelihood Ratio	1.031	1	.310		
Fisher's Exact Test				.346	.233
N of Valid Cases	72				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.38.

b. Computed only for a 2x2 table

## VITA

Andrea Haken

Candidate for the Degree of

Doctor of Philosophy

Dissertation: THE RELATIONSHIP BETWEEN PERSONALITY TYPE INDICATORS AND COLLEGE MATRICULATION OF SUMMER BRIDGE PARTICIPANTS.

Major Field: Educational Psychology

Biographical:

Education:

Completed the requirements of the Doctor of Philosophy in Educational Psychology at Oklahoma State University, Stillwater, Oklahoma in May, 2020.

Completed the requirements for the Master of Science in Wellness Management at The University of Central Oklahoma, Edmond, Oklahoma in 2013.

Completed the requirements for the Master of Education in Adult Education at The University of Central Oklahoma, Edmond, Oklahoma in 2009.

Completed the requirements for the Bachelor of Arts in Sociology in Human Services at The University of Central Oklahoma, Edmond, Oklahoma in 2007.

Experience:

Career Services Coordinator, Oklahoma State University	2012 – present
Adjunct Instructor, University of Central Oklahoma	2009 – 2013
Instructional Developer, Oklahoma State University	2010 – 2012
Freshman Academic Advisor, University of Central Oklahoma	2009

Professional Memberships:

National Association of Colleges and Employers  
National Career Development Association