How the Perceived Value of Education, Parental Influences, and Students' Perceived Success Affect Post-Graduate Decisions

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ABSTRACT

While technical education has been enhanced in many ways over the past few decades, college is still the preferred post-graduate path for many students and is the societal norm. This study will analyze the value that students view in their career path that leads them to make their post-graduate decisions. The goal of this research is to better understand why students pursue college and how these decisions come to be with specific attention paid to the impact of gender, interests, and self-efficacy. This understanding can educate others about the gravity of social norms and can start conversations about how to make both paths more accessible to students. This research will use a sample of thirty students from a college in New England. Evidence was found that students' perceptions of their parents' opinions are motivating their post-graduate decision-making. There was also evidence that gender of the student plays a role in this post-graduate decision-making.

INTRODUCTION

We have all heard (and dreaded) the question that every teenager at every family gathering, meeting with a guidance counselor, and among friends is asked as graduation approaches. Whether it be from our peers, teachers, or even parents: "Where are you going to college?" is the question that has become the norm to ask students. Many answer with the schools that they have researched or always pictured themselves attending. But others must respond by explaining that they are not pursuing higher academic education. Some of these students respond that they instead are pursuing vocational education and intend to be trained within a certain specialty. This begs the question: Why is going to college the social norm?

At the end of eighth grade, students face a big decision: whether they want to continue with their education in traditional high school or enlist in a vocational program at a trade school. This is an important starting point on the path to deciding one's career. From personal goals, interests, and expected life outcomes to parents'/guardians' expectations and gender stereotypes, the decision for students is not easy. On the other hand, for some it is the easiest decision to make, or maybe a decision that was made years before. However this decision is made, it is important to analyze the value that students observe in their career path that leads them to make their post-graduate decisions. It is also important to learn about the gravity of social norms and start conversations about how to make both paths more accessible to students. This study seeks to examine how students' perceived value of education, their parents'/guardians' perceived value of education, and students' perceived success after graduation affect students' post-graduate decisions.

LITERATURE REVIEW

The Perceived Value of Education

The Value of a College Education

In society, there is the notion that after high school, you must get a college degree to be financially well-off (Estes & McCain, 2019). For our purposes, college will be defined as higher academic education in which a student pursues a bachelor's degree in one of the traditional majors after graduating from high school. This distinction is made because the line between technical school and college can become obscure when certain programs are included that meet the criteria of both college and technical education systems. According to Carnevale and Ridley's (2017) analysis of the number of jobs in each state that pay well, there were thirty million jobs in the United States in 2017 with which one did not need a four-year college degree to sustain their family. This statistic indicates that while a college education might lead one to get a well-paying job, it is not the only way in which to do so.

While college may allow you to obtain a well-paying job, a college education is not the perfect solution to succeeding in life. In fact, it may even have some negative effects on some graduates (Adnett & Slack, 2007). A study performed by Adnett and Slack (2007, p. 30) examining whether higher education offered economic incentives to non-traditional students found that "overeducation" exists in the United Kingdom. They claim that this "overeducation" results from the rapid growth of higher education (Adnett & Slack, 2007, p. 30). To overcome this issue of a surplus of graduates competing for the same employment positions, higher academic education graduates are replacing jobs that were once held by non-graduates. This means that while some graduates are getting existing graduate positions, there is not enough room for all of the graduates to obtain careers within these fields. As a result, some graduates are taking over positions that were previously held by people who did not graduate from higher education. This is adversely affecting the rates of return to higher education as these graduates who are replacing roles that non-graduates previously held are earning a lower income than their peers who are working in graduate positions (Adnett & Slack, 2007). The lower incomes serve as another argument as to why the value of higher

academic education is not as beneficial as it is made out to be in society. To explain this further, a college education is viewed in society as a means to be financially well-off, but it does not always provide these benefits for its graduates (Estes & McCain, 2019).

The Value of a Vocational Degree

For our purposes, technical school will be defined as a four-year education that students decide to go to in lieu of traditional high school. We assume that these technical schools offer only the traditional specialties unless otherwise stated. For example, Technical and Vocational Education and Training (TVET) programs include many programs that are offered at traditional technical schools such as information technology, computer science, and civil engineering (*National Certificate,* n.d.). On the other hand, TVET programs also include many courses that are more untraditional including hospitality, office administration, and tourism (*National Certificate,* n.d.). It is important to distinguish between the different types of schools to better understand the conclusions that the authors were able to draw from these student populations.

While college degrees are typically perceived as a valuable asset to begin preparing your life for success, there is also value that derives from obtaining a vocational degree (Sibiya & Nyembezi, 2018). This value stems from the demand associated with having knowledge in a particular specialty (Sibiya & Nyembezi, 2018). In their study, Sibiya and Nyembezi (2018) researched the extent to which TVET college students with a focus on engineering believed they would be hired upon completion of the qualifications. This study found that having engineering TVET qualifications was valuable and allowed the study's participants to be fully employed upon completion of the program. On the other hand, some participants in Sibiya and Nyembezi's (2018) study responded that in addition to a vocational education degree, one also needs industry experience to distinguish themselves in the workforce. As with a college education, the expected outcomes after graduation are not guaranteed to be realized by every student (Adnett & Slack, 2007). The present study seeks to analyze the outcomes that students expect to receive after completing these programs.

Another study found that both vocational and academic education had value. In their study concerning the reasons why students in Switzerland pursue either the college or vocational track, Nägele et al. (2018) concluded that high value accredited to higher education was significant. They found that this value influenced students' decisions to pursue both higher vocational and higher academic education (Nägele et al., 2018). This contradicts the societal stereotype that higher academic education is more beneficial than higher vocational education.

The existing literature has identified weaknesses to each of these paths such as lower incomes from some higher education graduates because of "overeducation" (Adnett & Slack, 2007, p. 30) and the need for experience in order to distinguish oneself in the workforce (Sibiya & Nyembezi, 2018). However, the existing literature has also described the value of these two paths. The existing literature has demonstrated that you may obtain well-paying jobs from both technical school and college education (Carnevale & Ridley, 2017; Estes & McCain, 2019). It has also found graduating from certain specialties within TVET schools leads to full employment because of the demand in the field (Sibiya & Nyembezi, 2018). The value of these different paths is determined by the outcomes provided for their graduates. As a result of the existing literature, this study will focus on the premise that both academic and vocational education have value.

Technical School Over Time

Career and Technical Education (CTE) programs are another example of a school that offers a blend of traditional and unorthodox specialties. CTE programs include the more traditional culinary arts and automotive disciplines but also include more specialized fields such as furniture making, health occupations, and audio engineering and video editing (*National Certificate*, n.d.). It is important to distinguish between the different types of schools to better understand the population of students that will be analyzed.

Technical education was once very different than it is in its present form today (Estes & McCain, 2019). Throughout the 1900s, technical school was seen as an inferior educational

path to college, a place in which students were marginalized, trained in low-skill jobs, and less likely to complete high school than their peers (Estes & McCain, 2019; National Center for Education Statistics *Table 5a,* n.d.; National Center for Education Statistics *Table P134*, n.d.). Today, technical education has become a much more competitive path (Estes & McCain, 2019). As stated earlier, having engineering TVET qualifications allowed the participants in Sibiya and Nyembezi's (2018) study to be fully employed upon completion of the program. This shows the improvement of technical schools from a place where students once had poor outcomes, such as not completing high school, to now obtaining employment after graduation **(**Estes & McCain, 2019; National Center for Education Statistics *Table 5a,* n.d.; National Center for Education Statistics *Table P134*, n.d.; Sibiya & Nyembezi, 2018).

While technical school may have improved in many ways in the past few decades, some barriers to entering technical school still exist today. For example, high-quality CTE programs are more likely to be found within wealthier areas and can, therefore, provide better equipment in classrooms and attract more qualified instructors (Estes & McCain, 2019). According to Sibiya and Nyembezi (2018), the curriculum in technical schools also has created social inequalities and exclusion. This demonstrates that while technical schools may have experienced improvements over the years, access to these improved systems is limited (Estes & McCain, 2019). It, therefore, calls into question the purpose of these improvements if only some people are able to access them.

Gender

Gender is another factor that can affect students' perceptions of education (Bergeron & Romano, 1994; Campbell, 1986; Estes & McCain, 2019; Fernández-García et al., 2019; Gaskell, 1984; McHale et al., 2009; Nägele et al., 2018; Şeker, 2020; Stoll et al., 2017; Tomlinson & Evans-Hughes, 1991). Traditional gender roles and societal standards are still very integrated into the school system and young adults' thinking processes (Gaskell, 1984). Through interviews with twelfth-grade high school students from three different schools in Vancouver, Canada, Gaskell (1984) found gender differences in the career fields that the students pursued. This serves as an example of the segregation of labor markets and the

adherence to traditional gender roles (Gaskell, 1984). While this source is dated, it still has value because it has become an accepted social norm within the educational system that female students typically do not enter male-dominated careers (Chester, 1983; Estes & McCain, 2019; Gaskell, 1984).

This social norm found support in Chester's (1983) study concerning sex differences among students at a predominantly (90%) white liberal arts school and an "integrated" (30% black) vocational school both in the Northwest (p. 32). In this study, the parameter for interest in a male-dominated career area was determined through data from the 1970 Census. This metric analyzed how many males were employed in the students' chosen career area as reported in the 1970 Census. Chester's (1983) study found that females showed less interest in pursuing jobs in male-dominated fields. A little more recently, in Bergeron and Romano's (1994) study concerning students' level of vocational indecision, level of college major indecision, and self-efficacy, this concept was reiterated. The study found that more women than men responded that they would pursue a career that was dominated by the opposite sex (Bergeron & Romano, 1994). Most of the existing literature focused on the case that women typically would not enter male-dominated fields, so Bergeron and Romano's (1994) conclusion offered another layer to Chester's (1983) findings.

The previously stated conclusions were drawn from studies of high school and college students, but traditional gender roles are also embedded in vocational schools (Estes & McCain, 2019; Nägele et al., 2018). Within vocational education, CTE students may be bullied by other students for specializing in programs that oppose traditional gender roles (Estes & McCain, 2019). Overall, among studies performed with both vocational and academic students, one study found that gender did not affect the decision to pursue higher vocational or higher academic education (Nägele et al., 2018). The result of this study contradicts the previous argument that students will generally follow traditional gender roles (Nägele et al., 2018). As much of the existing literature demonstrated, women typically would not enter male-dominated fields (Chester, 1983; Estes & McCain, 2019; Gaskell, 1984). The present study looks to examine this relationship further.

Gendered Interests

Many studies have also examined gendered interests as a determinant of career choice (Campbell, 1986; Else-Quest et al., 2013; Gaskell, 1984; Stoll et al., 2017; Tomlinson & Evans-Hughes, 1991). One conclusion that was drawn by an analysis performed by Campbell (1986) was that gender has a strong influence on the specialty that students in vocational education choose to pursue. Through interviews with twelfth-grade high school students from three different schools in Vancouver, Canada, Gaskell (1984) found that men and women in academic education were also preparing to enter jobs in different markets. As a result, the females took more "useful" and "worthwhile" classes, or business classes, during high school and the males took "easy" and "interesting" industrial education classes (Gaskell, 1984, p. 214). These "useful" business classes prepared the women for a job and provided a skill that they would use in the workforce (Gaskell, 1984, p. 214). This offers an illustration of how men and women have interests in different career areas. Campbell (1986) furthers this argument on the vocational side by noting that business is a dominant specialty for women and trade and industry are dominant specialties for men within vocational education. More recently, Else-Quest et al. (2013) found that males in their study reported more positive math attitudes and females reported more positive science attitudes. This also shows that men and women have different interests that therefore determine which careers they are more passionate about.

In their analysis of data on the career interests of ethnically diverse college students at a large, predominantly White, eastern public university, Tomlinson and Evans-Hughes (1991) conclude that men prefer occupations that are realistic, investigative, and enterprising while women prefer occupations that are social, artistic, and conventional. It is perhaps not surprising, then, that Tomlinson and Evans-Hughes (1991) found that women are more likely to prefer people-oriented careers. Similarly, the Else-Quest et al. (2013) study analyzed gender differences in attitudes towards certain subjects. As mentioned above, the study concluded that males had a higher math self-concept and expectations of success and therefore had more positive math attitudes compared to females. In this study the definition of self-concept was very similar to self-efficacy in that it measured not only how positively

participants perceived themselves individually but also when compared to others. Additionally, the study found that females reported higher science value, and therefore had more positive science attitudes than their male peers. Overall, the study found gender differences in attitudes towards math and science and also found that these attitudes predicted achievement in both subjects (Else-Quest et al., 2013). While the existing literature supports the perspective that there is a gender difference in vocational interests, Stoll et al.'s (2017) study disputes this perception. Their study found that there was no gender difference in the contribution of vocational interests and their effect on either work or health outcomes (Stoll et al., 2017).

Self-Efficacy

According to Nägele et al. (2018), positive learning experiences lead to self-efficacy and outcome expectations. Self-efficacy refers to people's inherent beliefs about their personal ability to accomplish their goals (Else-Quest et al., 2013). The positive learning experiences discussed in Nägele et al.'s (2018) study were seen as important for students to pursue higher education. Aspiration is another factor that is very closely related to self-efficacy that affects the post-graduate decision. This educational aspiration was measured in Nägele et al.'s (2018) study by asking participants the highest degree that they are going to attain. In Chester's (1983) study, it was concluded that women at the predominantly white liberal arts high school had lower aspirations than men. In addition, in Rosecrance et al.'s (2019) study of how aspirations to pursue a Science, Technology, Engineering, Mathematics, or Medical (STEMM) career affect perceptions among different genders and first-generation college student status, they concluded that women are more likely to believe in their ability to accomplish their goal of getting into and staying in college. In Turner et al.'s (2019) study concerning whether socioeconomic status, barriers, and support would predict self-efficacy and outcome expectations, it was concluded that boys had greater efficacy and outcome expectations than girls. The combination of all of these findings lend themselves to a complicated analysis of self-efficacy levels among students of different genders and races. The present study looks to investigate these relationships further.

Vocational Interests

While we have discussed the effect that self-efficacy can have on post-graduate decisions, these decisions are also affected by factors such as career interests. Vocational interests are defined as personality elements that reflect differences in one's motives and goals (Stoll et al, 2017). These vocational interests determine the careers that one becomes interested in as their personality and personal goals are aligned with what these careers offer. In their study concerning how aspirations to pursue a STEMM career affect perceptions among different genders and first-generation college student status, Rosecrance et al. (2019) used a questionnaire to determine college outcome expectations. This questionnaire evaluated students' beliefs about the significance of pursuing a college degree. This study found that students who were interested in pursuing a career within the STEMM fields had higher college-going self-efficacy and college outcome expectations than their non-STEMM peers (Rosecrance et al., 2019). The result of Rosecrance et al.'s (2019) study reveals that students with certain interests, such as students interested in STEMM careers, are more likely to pursue a college education than students interested in other fields.

Bergeron and Romano (1994) go into detail about how the level of indecision in a specific vocation can affect a student's post-graduate decisions. In a study performed by Bergeron and Romano (1994) at a large midwestern university, information regarding students' level of vocational indecision, level of college major indecision, and self-efficacy was collected through anonymous questionnaires. This study found that students who had lower levels of self-efficacy were more likely to be undecided in their vocation. They also found a strong relationship between the levels of vocational indecision and the levels of college major indecision. While these levels of indecision had a relationship with each other, they also had relationships with another factor that could affect the post-graduate decision: self-efficacy. In their study, Bergeron and Romano (1994) found a significant relationship between the levels of college major indecision and self-efficacy. This indicates that the level of college major indecision can affect post-graduate decisions.

In addition to students' indecision affecting their post-graduate decisions, the results of Heckhausen and Tomasik's (2002) study further indicate that people may have different motivating factors that determine their level of aspiration. For example, Heckhausen and Tomasik (2002) found that females who were "over aspiring" (whose vocational aspirations exceeded their school achievements) demanded a greater need for financial security. It is likely, then, that these students would pursue a career in which they would find financial stability. This study also found that females who were motivated by intimacy, defined in the article as "reciprocal love and affection," showed a tendency to under-aspire in their vocational aspirations (Heckhausen & Tomasik, 2002, p. 214). This means that they would not apply to competitive apprenticeships even though they performed well in school (Heckhausen & Tomasik, 2002). Students with a heightened need for financial security or intimacy may not pursue their dream career because it may not provide them with these things. This is important to the present study because while motivating factors may not be directly tested, they may explain some discrepancies between students' needs and wants in their long-term career and the career path that they are actively pursuing.

Campbell (1986) found support for the claim that the level of vocational indecision affects life outcomes. An analysis performed by Campbell (1986) indicated that those who are more decided on one field of study tend to have higher wages than those who pursue a general curriculum. The analysis reported that students who take six credits in a specialty earn ten percent higher wages than those in a general curriculum (Campbell, 1986). This builds upon the conclusions offered by Heckhausen and Tomasik's (2002) study and offers that students who are more vocationally decided can expect to have higher wages than those who are more vocationally undecided. While Campbell (1986) is an older source, it offers a valid conclusion. In fact, another study has found similar results that support these findings (Stoll et al., 2017). For example, Stoll et al.'s (2017) study found that vocational interests can predict life outcomes. The life outcomes that the study examined include full-time employment, gross income, unemployment, being married, having children, having a stable relationship, never having a relationship, health complaints, and health status social comparison. The study found

that vocational interests were significant in predicting seven of the nine life outcomes that were investigated (Stoll et al., 2017). Students may decide to enter college or trade school in pursuit of these desired life outcomes. This relationship between vocational interests and life outcomes will be discussed in more detail in a later section of the present study.

Perceived Barriers

Perceived educational barriers are another variable that affect students' ability to make career decisions (Campbell, 1986; Fernández-García et al., 2019; Ojeda & Flores, 2008; Turner et al., 2019). A study performed by Ojeda and Flores (2008) used demographic questionnaires that investigated the effect that gender, generation level, parents' education level, and perceived educational barriers had on Mexican American students' educational aspirations. Questionnaires were given to Mexican American students attending two mostly Mexican American public high schools located in a town near the Texas-Mexico border in which ninety-four to ninety-five percent of students have Mexican backgrounds. According to the study, perceived educational barriers had a significant impact on predicting students' educational aspirations. Perceived educational barriers also had a larger impact on educational aspirations than any of the other variables measured in the study (Ojeda & Flores, 2008).

Heckhausen and Tomasik (2002) offer another level of analysis of students' perceived barriers in their study of tenth-grade students from four high schools in Berlin, Germany. The study examined how students will invest more resources, adjust their dream job, and better match their vocational aspirations (operationally defined in this study as apprenticeships applied to) to their academic achievement as the deadline approaches. The participants in Heckhausen and Tomasik's (2002) study wrote down five personal goals, when they expected to achieve these goals, and the total years of their parents' schooling and vocational education to evaluate their parents' educational background. This study found that males who perceived few barriers were more likely to match their vocational aspirations and school achievements and were thus more realistic with which jobs they would be able to obtain (Heckhausen & Tomasik, 2002). Heckhausen and Tomasik (2002) also concluded that males who didn't match their vocational preferences to their school achievement had longer time frames to

accomplish their personal goals. In their study, Heckhausen and Tomasik (2002) offer that students should invest more of their time, energy, and effort into searching for opportunities sooner and should also not be afraid to ask for help if or when they may need it.

Considering the existing literature, the following research question and hypothesis are offered:

> **RQ1:** Do males and females have equal career decision-making self-efficacy and outcome expectations?
> **H1:** Males have higher career decision-making self-efficacy and outcome expectations than females

Parental Influences on the Perceived Value of Education

Many theories in the existing literature attempt to explain factors that affect career choice (Bergeron & Romano, 1994; Else-Quest et al., 2013; Fernández-García et al., 2019; Ojeda & Flores, 2008; Rosecrance et al., 2019; Turner et al., 2019). One of the more commonly used theories is the Social-Cognitive Career Theory, derived from Albert Bandura's Social Cognitive Theory (Bergeron & Romano, 1994; Bandura, 1997). Bandura's (1977) theory states that people become interested in activities they feel a sense of achievement and get self-satisfaction from. The Social-Cognitive Career Theory builds upon this and states that self-efficacy, outcome expectations, and personal goals are the foundation of career development (Else-Quest et al., 2013; Fernández-García et al., 2019; Ojeda & Flores, 2008; Rosecrance et al., 2019). It also reinforces the notion that someone's self-efficacy and outcome expectations drive the effort that they will put into ensuring that they achieve their goal (Turner et al., 2019).

The Social-Cognitive Career Theory is supported by the research of Rosecrance et al. (2019) who used aspirations to pursue a STEMM career as one of the factors that influenced perceptions among students of different genders and first-generation college student status.

The existing literature indicates that parents play a significant role in the field that their children ultimately end up in (Dryler, 1998; Fernández-García et al., 2019; Ojeda & Flores, 2008). One such study examined the effect that a parent working or being educated within a specific discipline has on their children also entering that field. Dryler (1998) examined whether parental characteristics such as working within the same field, being the same gender as their child, or being the dominant parent in the house affect their children's choice of education type. Every fourth secondary school in Sweden was randomly drawn and data was collected from everyone that graduated between 1988 and 1992. The parents' fields of study included technical, humanities and social science, health care, and administration and were obtained through Census data. Students' choice of upper secondary school program was obtained through school records. These two fields were compared and the hypothesis about children entering the same educational program as their parents was found to be significant (Dryler, 1998). This provides one explanation as to why some students pursue certain career areas.

Gender Stereotypes

One study found within the existing literature has also shown that the gender stereotypes that parents have may affect their children's decision to pursue certain careers (Fernández-García et al., 2019). In their study of students from a multitude of institutions in their last year of compulsory education in Spain, Fernández-García et al. (2019) examined voluntary questionnaires that involved a science and technology self-efficacy scale. In this study, females perceived that their parents expected males to perform better than females in the technology field. The study overall found support for the hypothesis that parents had gender stereotypes concerning the expectation of their sons and daughters to do well in Science, Technology, Engineering, or Mathematics (STEM) fields. Specifically, it concluded that males perceive their parents to be more supportive of their technology and computing interests than they were of females. It should also be noted that this study found no direct causation, but it did indicate a correlation between parents' gender stereotypes and their children's outcome expectations and interests (Fernández-García et al., 2019). While there may not be a direct correlation between these gender stereotypes and their children's outcome

expectations and interests, a correlation exists between them (Fernández-García et al., 2019). The present study looks to examine this relationship further.

The Social-Cognitive Career Theory can also be supported by the notion that participants within Rosecrance et al.'s (2019) study who were interested in pursuing a career within the STEMM fields had higher college-going self-efficacy and college outcome expectations than their non-STEMM peers. As mentioned above, existing literature has shown that males perceive their parents to be more supportive of their interest in STEMM fields than they are of females and that parents' gender stereotypes have an effect on their children's aspirations (Fernández-García et al., 2019). The STEMM fields are still overwhelmingly dominated by men (Rosecrance et al., 2019). One possible explanation of this phenomenon is that males have their parents' support and students pursuing a STEMM career have a higher college-going self-efficacy than their non-STEMM peers (Fernández-García et al., 2019; Rosecrance et al., 2019).

Most of the previously discussed literature supports the notion that students' self-efficacy is an important factor when deciding whether to pursue technical or academic education. However, a conclusion from the study of Fernández-García et al. (2019) belies the idea that perceived parental academic expectations and gender stereotypes affect their children's post-graduate decisions. In their study of the effects of parents' academic expectations on their children's self-efficacy, outcome expectations, and interests, they found that parents' gender stereotypes did not directly affect their children's outcome expectations and interests (Fernández-García et al., 2019). This offers a contradiction to the previously discussed idea that parental gender stereotypes affect children's decision to pursue certain careers (Fernández-García et al., 2019).

Support

Support from different individuals can predict efficacy and outcome expectations (Tentama & Nur, 2021; Turner et al., 2019). In their investigation of whether socioeconomic status, barriers, and support would predict self-efficacy and outcome expectations, Turner et al.

(2019) recruited tenth-grade through twelfth-grade adolescents in a Midwestern metropolitan area. The participants were drawn from one urban school around which ninety-five percent of people live in poverty and one middle socioeconomic status suburban school around which less than seven percent of people live in poverty. Turner et al. (2019) found that support from fathers and peers predicted efficacy and support from mothers predicted outcome expectations. While social support was significant in predicting efficacy and outcome expectations, another study found that it did not affect the pursuit of higher vocational or higher academic education (Nägele et al., 2018). This serves as a contradiction to Turner et al.'s (2019) findings because as we will discuss further in a later section, outcome expectations are predictive of involvement in higher education (Nägele et al., 2018).

Socioeconomic Status

A child's socioeconomic status is largely consequential by their parents' wealth (Adnett & Slack, 2007; Smith et al., 2000). This status can help explain why students make certain post-graduate decisions. Adnett and Slack (2007) explain the outcome expectations of students with a lower socioeconomic status. In an analysis performed by Adnett and Slack (2007) examining whether higher education offered economic incentives to non-traditional students, they found that students of a lower socioeconomic status tend not to enter higher academic education. A study included in their analysis found that these students of a lower socioeconomic status have lower expected rates of working in graduate occupations after graduation than their peers who may have a higher socioeconomic status (Smith et al., 2000).

While Smith et al. (2000) examined how higher academic education was affected by socioeconomic status, higher vocational education is also affected. In Campbell's (1986) analysis, it was stated that ability, grades, aspirations, and socioeconomic status are the most important factors in deciding to enter vocational education. In Turner et al.'s (2019) study of whether socioeconomic status, barriers, and support would predict self-efficacy and outcome expectations, it was concluded that socioeconomic status predicts outcome expectations. These outcome expectations will be discussed further in the next section of the present study.

While the previous studies found that socioeconomic status was correlated with entering higher education, Nägele et al. (2018) found that sociodemographic variables such as social background, nationality, and gender don't have as strong of an impact on pursuing higher vocational education as was expected. In this study, the sociodemographic variables alone could not explain why students entered higher vocational education. This contradicts other existing literature because, in other articles, gender and socioeconomic status did affect students' post-graduate decisions (Campbell, 1986; Estes & McCain, 2019). After the above discussion of parental influences on their children's post-graduate decisions, we offer the following research question and hypothesis:

> **RQ2:** Is there a correlation between students' perceptions of their parents' gender stereotypes and the student's outcome expectations and interests?
> **H2:** Students' perceptions of their parents' gender stereotypes are correlated to the student's outcome expectations and interests

Students' Perceived Success

Outcome Expectations

Earlier we discussed that vocational interests can predict life outcomes. The converse is also true; expected outcomes can predict interests (Turner et al., 2019). Turner et al. (2019) explain that people become interested in certain careers in which they anticipate achieving the expected outcomes of these careers. Heckhausen and Tomasik (2002) offer another level of analysis to outcome expectations. They find that students' outcome expectations may also vary over time, specifically as the deadline approaches to make a decision. As the deadline gets closer, they found that students' "dream jobs" become more realistic (Heckhausen & Tomasik, 2002, p. 214). This means that the students' vocational aspirations more closely match their academic achievements as graduation nears (Heckhausen & Tomasik, 2002).

Sibiya and Nzyembezi (2018) offer another conclusion in TVET schools concerning outcome expectations. Their study investigated the extent to which TVET college students with a focus in engineering believed they would be hired upon completion of the qualifications (Sibiya and

Nzyembezi, 2018). They explain that poor job placement history is a reason why some students may not pursue technical school (Sibiya and Nzyembezi, 2018; Vally & Motala, 2014). As a result of these expected outcomes from both students in higher vocational education as well as higher academic education, we offer the following research question and hypothesis:

RQ3: Which factor has the largest influence on post-graduate decisions?

H3: Outcome expectations will have the largest influence on post-graduate decisions.

METHOD

Study Design

The goal of this study is to quantitatively analyze how students' perceived value of education, their parents'/guardians' perceived value of education, and students' perceived success after graduation affect students' post-graduate decisions. In order to accomplish this, a survey design was adopted. A quantitative approach was employed to analyze the survey results using measures modified from multiple scales. The quantitative approach included methods such as Hypothesis Tests and Regression Models. These scales include the College-Going Self-Efficacy Scale (Gibbons et al., 2006), the Career Decision-Making Self-Efficacy Scale-Short Form (CDMSE; Taylor & Betz, 1983), the Gender Role Attitudes Scale (GRAS; García-Cueto et al., 2015), the Sources of Science and Technology Self-Efficacy Scale (Britner & Pajares, 2006; Fernández-García et al., 2019), and the College Outcome Expectation Questionnaire (COE; Flores et al., 2008; Fouad & Smith, 1996; Hackett et al., 1992) (see Appendix A).

Sample

The original sample population included students from two schools in New England. These participants included senior undergraduate students at Bryant University along with students over the age of eighteen enrolled in E. C. Goodwin Technical High School. Participants were recruited by convenience and snowball sampling in which all senior undergraduate honors program students at Bryant University as well as students that are currently enrolled in the

same classes as I received the survey by email. To send the survey to technical school students, a snowball sample was employed to use the network that we have access to. The informed consent in the survey states that all participants must be over the age of eighteen and agree to the terms of the study. However, after getting a limited number of responses to the survey by the students at the technical high school (five complete responses), we were unable to use this population in our data analysis. Thus, going forward throughout this study we will only be discussing the college student population that we were able to collect survey data from. We were able to gather thirty responses from the Bryant University students.

Measures

Demographics

In the first part of the survey, several demographic questions were asked, such as the age, gender, ethnicity, first-generation college student status, and type of school (technical school or college) the students are attending. We also asked about their parents'/guardians' occupations and education levels. These were used to get a more general understanding of the parents or guardians involved. To get a general understanding of the students' perceptions of their parents' opinions, we asked four multiple-choice questions including some such as: **"**Which statement most accurately describes your mother/female guardian's opinion about your education?" and **"**Which statement most accurately describes your father/male guardian's opinion about your education?" from the College-Going Self-Efficacy Scale (Gibbons et al., 2006) (see Appendix A.3, Appendix A.4). These questions provided more background information on the parents of the students that we surveyed and their opinions.

Self-Efficacy

Questions were also asked from the Career Decision-Making Self-Efficacy Scale-Short Form (CDMSE; Taylor & Betz, 1983) (see Appendix A.6). The results of these questions provided a broader sense of the students' self-efficacy and how they perceive themselves. These questions are scored on a Likert scale from zero to nine in which zero represents "No Confidence" and nine represents "Complete Confidence" in the ability to accomplish certain tasks. A few of the questions included in this survey are: "Please state your own level of

confidence that you would be able to accurately assess your abilities" and "Please state your own level of confidence that you would be able decide what you value most in an occupation." This information may be important to the present study because self-efficacy is closely related to outcome expectations which further predicts post-graduate decisions (Else-Quest et al., 2013).

Parents' Perceived Value of Technical School and College

The Gender Role Attitudes Scale (GRAS; García-Cueto et al., 2015) (see Appendix A.3, Appendix A.4, Appendix A.7) was used to examine what students believe their parents'/guardians' perceptions of these different types of education to be. This questionnaire was modified to include twelve questions that all ask about parents' perceptions of gender roles. Some of these questions are measured on a Likert scale from zero to nine in which zero represents "Totally Agree" and nine represents "Totally Disagree." Example questions from the scale include: "Some jobs are not appropriate for women" and "In my social circle, my future domestic activity is considered more important than my professional activity." These questions quantify students' perceptions of parents'/guardians' overall gender stereotypes. Other questions were measured on a scale of gender in terms of which gender the statement is more prevalent to. These questions were on a Likert scale from zero to ten in which zero through four represent "Male," six through ten represent "Female," and five represents that the trait is equally prevalent to both genders. Some questions measured on this scale include: "My father/male guardian believes that college is appropriate for ___" and "My mother/female guardian believes that vocational/technical education is appropriate for ___."

In this study, students were asked about their perceptions of their parents' beliefs concerning gendered careers. The original scale, the Sources of Science Self-Efficacy Scale (Britner & Pajares, 2006), was modified into the Sources of Science and Technology Self-Efficacy Scale (Fernández-García et al., 2019) (see Appendix A.3, Appendix A.4) which was again modified for the purposes of this study. Survey questions from this scale included four questions that are measured on a Likert scale from zero to nine in which zero represents "Strongly Disagree" and nine represents "Strongly Agree." Example questions from the scale include: "My

father/male guardian believes that I have high abilities to get good marks in academic classes" and "My mother/female guardian believes that I have high abilities to get good marks in vocational/trade classes." These questions aimed to quantify parents'/guardians' perceptions of gendered careers in both technical school and college.

Students' Perception of Success

In order to determine students' outcome expectations in technical school and college**,** six question**s** were asked using a modified version of the College Outcome Expectation Questionnaire (COE; Flores et al., 2008) (see Appendix A.5). The scale used in Flores et al. (2008) was formed by scales found within the work of Fouad and Smith (1996) and Hackett et al. (1992) and based on conceptual definitions originally provided by Bandura (1986). The questions within the current study ask the student whether the type of education (technical school or college) will allow them to achieve certain life goals. We recognize that outcomes may vary among individuals who have the same qualifications, and that the realization of these expected outcomes may not occur for every individual (Adnett & Slack, 2007). This was important to the present study because we focused on the expected outcomes of the careers themselves, not on individuals' experience in achieving these or not. These questions were phrased, "Please state how strongly you agree or disagree with the following statements." These questions are measured on a 10-point Likert scale ranging from zero representing "Strongly Disagree" to nine representing "Strongly Agree." A few of these questions include: "My education will allow me to obtain a job I like doing," "My education will allow me to do well in life," and "My education will make me better able to achieve my career goals." The aim of these questions was to determine students' perceptions of success in both technical school and college.

A modified version of the Employability Scale Items (Rothwell et al., 2007) was used to ask participants about their expectations of being employed after graduating from their respective school. Questions from this scale include sixteen questions that are measured on a 10-point Likert scale from zero representing "Strongly Disagree" to nine representing "Strongly Agree." Some of these questions include: "My degree is seen as leading to a specific career

that is generally perceived as highly desirable" and "Employers are eager to employ graduates from my school." These questions quantify students' expectations of employability after graduation. This employability expectation is very important to students of both paths because as mentioned before, students choose their educational path in hopes of achieving its expected outcomes.

DATA

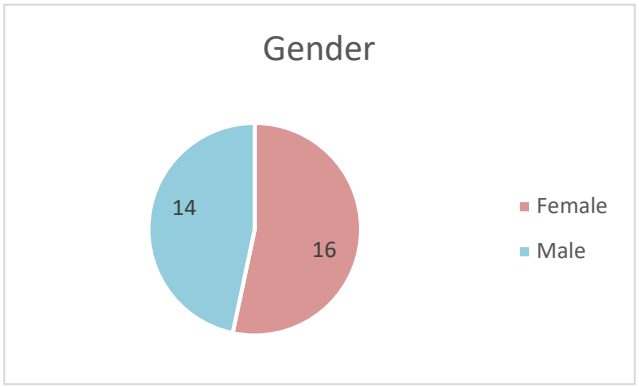


Figure 1. The gender breakdown of the Bryant University survey participants was almost equal between male and female. Females were 53.33% of the sample population while males were 46.67% of the sample population. This provided an opportunity to determine how gender affected the post-graduate decisions of our sample population.

From our survey, we were able to collect thirty responses from Bryant University students. The gender breakdown of our participants indicated that there were almost equal numbers of male and female participants. The participants were 53.33% female and 46.67% male (see Figure 1). This provided an opportunity to determine how gender affected the post-graduate decisions of our sample population.

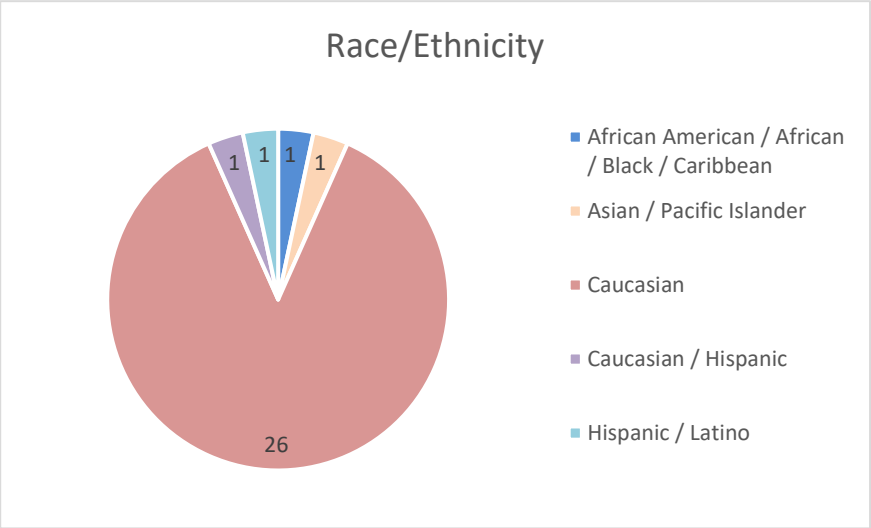


Figure 2. An overwhelming majority of Bryant University survey respondents are Caucasian. As a result of this, we mainly learned about the Caucasian students and did not learn too much about other demographics.

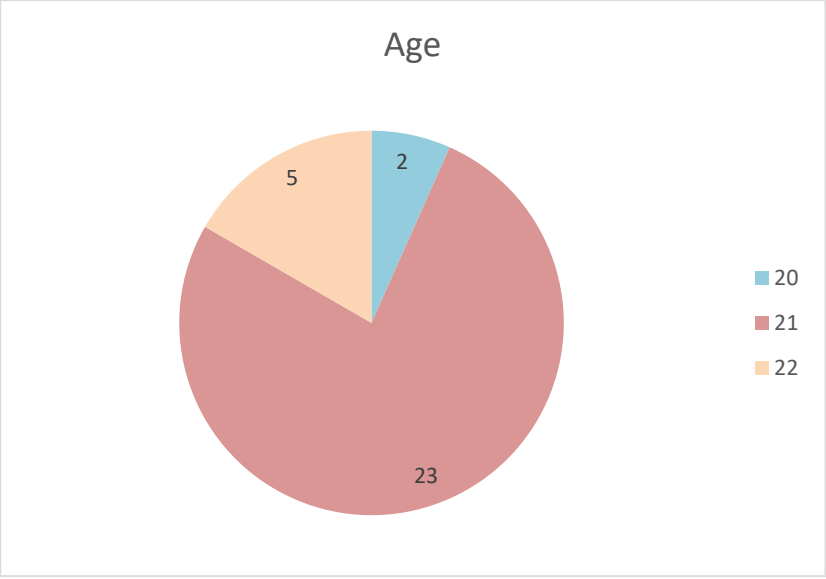


Figure 3. Most Bryant University participants in the survey are age 21. Through this sample, we mostly learned about 21-year-old students and were not able to learn as much about students of other ages.

From an analysis of the race/ethnicity of our survey respondents we learned that about 86.67% of our sample population is Caucasian (see Figure 2). Our survey also revealed that about 76.67% of participants were age 21 (see Figure 3). As a result of this, we mainly learned about the Caucasian, 21-year-old students and did not learn too much about other demographics.

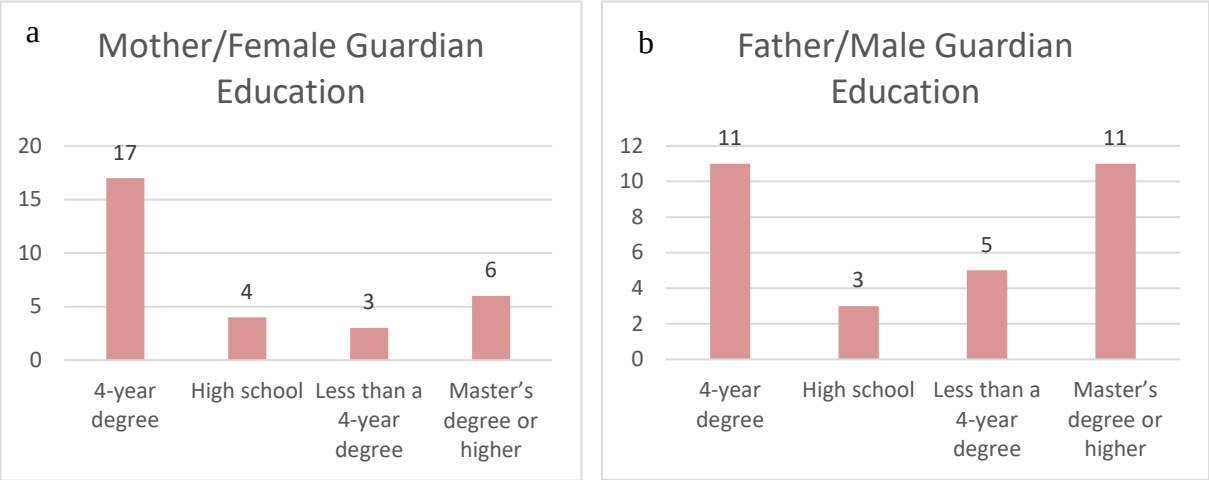


Figure 4a, Figure 4b. The fathers/male guardians of the participants are more highly educated than the mothers/female guardians of the participants.

As shown in Figures 4a and 4b, the fathers/male guardians of the survey participants are more highly educated than the mothers/female guardians of the participants. This difference in education level between mothers/female guardians and fathers/male guardians caused us to hypothesize about how parents'/guardians' education level affects their perceived opinion of their child's education. Our survey revealed that 86.67% of Bryant University student participants had a parent or guardian who also attended college (see Figure 5). This illustrates that a parent attending college may have an effect on their child following in their footsteps and also attending college.

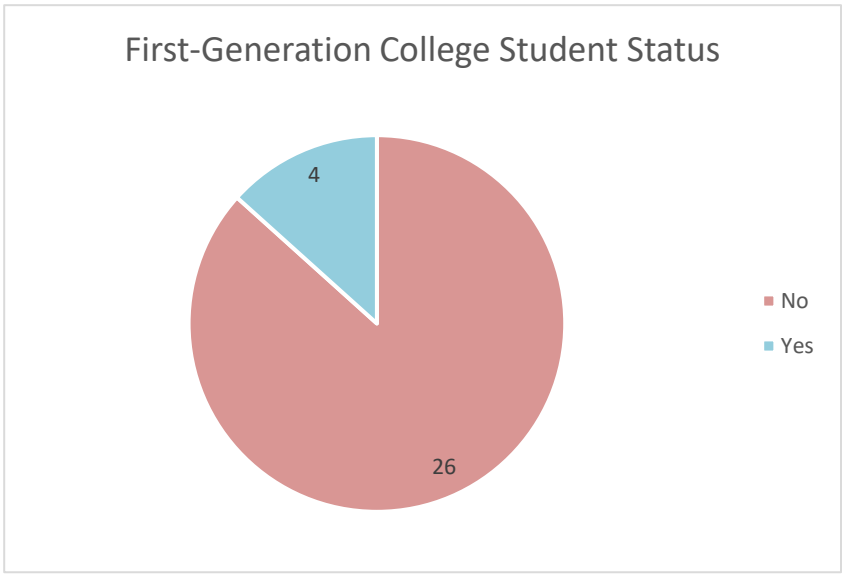


Figure 5. Most students were not first-generation college students. Thus, most students who attended college had parents/guardians who also attended college.

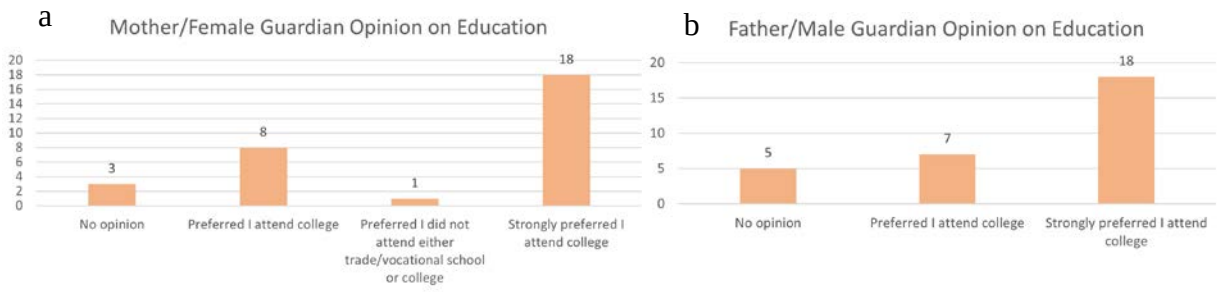


Figure 6a, Figure 6b. Mothers/female guardians and fathers/male guardians had very similar perceived opinions concerning their child's education. 60% of these responses indicated a strong perceived parental opinion that their child should attend college. Another 25% of responses indicated a preference that their child attend college.

Through the survey results we learned from the participants that mothers/female guardians and fathers/male guardians had very similar perceived opinions concerning their child's education (see Figure 6a, Figure 6b). Overall, 85% of parents indicated a preference or a strong preference that their child attend college. This aligns with our finding that 86.67% of

college students had parents who were also college educated. Through data analysis, we were interested to find if parents' education did influence their child's post-graduate decisions.

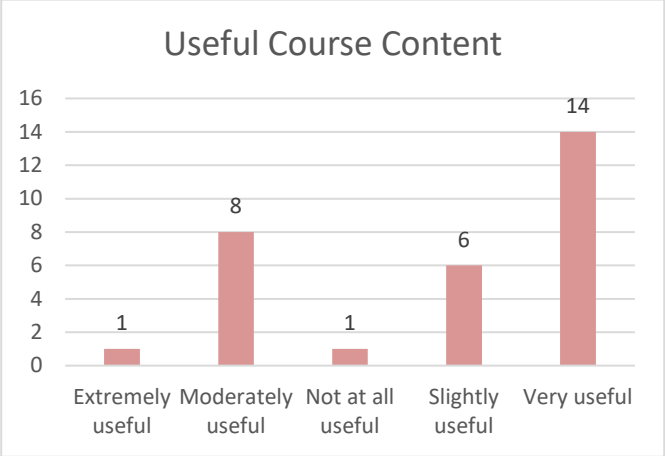


Figure 7. The survey responses indicate that 3.33% of participants believe that their course content would be "extremely useful," 46.67% of participants believe that their course content would be "very useful," and 26.67% of participants believe that their course content would be "moderately useful" for their future careers.

In the survey, 76.67% of participants indicated that the content of their courses will either be "extremely useful," "very useful," or "moderately useful" (see Figure 7). Using regression models, we were interested in determining if the usefulness of course content would influence post-graduate decisions. To elaborate, it was expected that if students perceived their class content to be more useful, they would be more likely to pursue that post-graduate path.

RESULTS

Hypothesis Tests

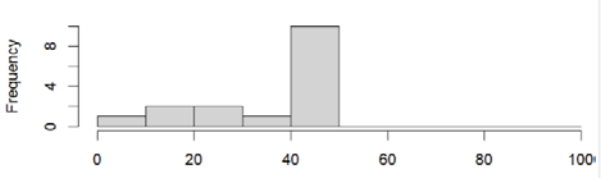
As part of our data analysis, we conducted numerous hypothesis tests to examine whether males have higher career decision-making self-efficacy and outcome expectations than females, as well as whether students' perceptions of their parents' gender stereotypes are related to the student's outcome expectations and interests. It is worth mentioning that because

we performed so many hypothesis tests, there is a higher likelihood that we would obtain a significant test result purely due to chance. To accommodate for this, we employ the Bonferroni Correction which decreases the alpha value that is compared to the p-value from our hypothesis tests to determine if the hypothesis should be rejected or not. Using the Bonferroni Correction, the 0.05 alpha value that we would normally use to compare p-values to was divided by sixteen for the sixteen Z-tests that we ran. This resulted in an alpha value of 0.003125 that would then be compared to the p-values of the hypothesis tests.

One of the hypothesis tests that we performed compared female students' perceptions of their father/male guardians' opinion towards which gender they thought trade school is appropriate for to that of male students (Appendix B). The question in the survey that asked about this was "Please indicate your father/male guardian's opinions regarding which gender trade school is appropriate for." The female mean for this question was 39.1875 and the male mean for this question was 49.3571, indicating that female students perceived their fathers'/male guardians' opinions to be more favorable to men than the perception of male students. Figure 8a contains the distribution of the survey responses that female students perceived their father/male guardian's opinion that trade school is appropriate for. Figure 8b contains the distribution of the survey responses that male students perceived their father/male guardian's opinion that trade school is appropriate for. When the hypothesis test was performed, it resulted in a p-value of 0.0420. This indicated that there is some evidence that fathers/male guardians of female students think that trade school is more appropriate for men.

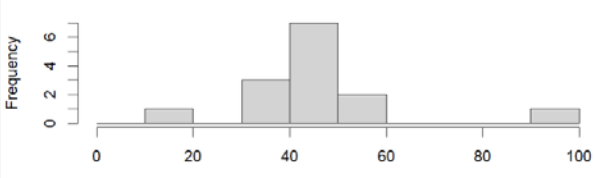
Mother/Female Guardian's Perceived Opinion: Which Gender Trade School is Appropriate For, Comparing Female and Male Student Responses

a



Female Student Responses

b

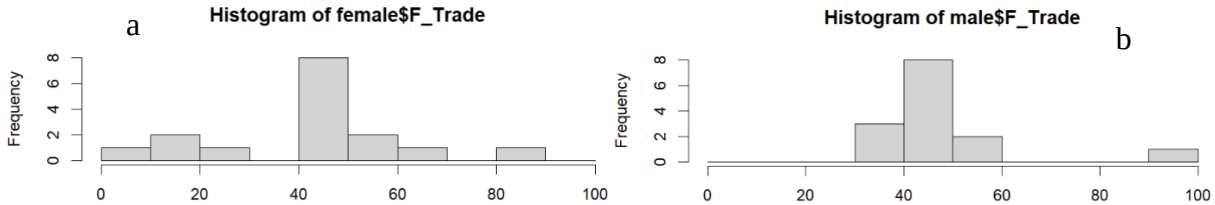


Male Student Responses

Figure 8a, Figure 8b. The graph on the left (Figure 8a) shows female students' perceptions of their father/male guardians' opinion towards which gender they think trade school is appropriate for. This graph being left-skewed tells us that fathers/male guardians of female students think trade school is more appropriate for men. The graph on the right (Figure 8b) shows male students' perceptions of their father/male guardians' opinion towards which gender they think trade school is appropriate for. This graph being slightly left-skewed tells us that fathers/male guardians of male students think trade school is more appropriate for men.

Another hypothesis test that was performed compared female students' responses to male students' responses concerning which gender they perceived that their mother/female guardian thinks trade school is appropriate for. The code for this hypothesis test can be found in Appendix B. The female mean for this question was 45.3125 and the male mean for this question was 51.0714, indicating that female students perceived their mothers'/female guardians' opinions to be more favorable to men than the perception of male students. Figure 9a contains the distribution of the survey responses that female students perceived their mother/female guardian's opinion that trade school is appropriate for. Figure 9b contains the distribution of the survey responses that male students perceived their mother/female guardian's opinion that trade school is appropriate for. When the hypothesis test was performed, it resulted in a p-value of 0.1785. This indicates that there is some evidence that mothers/female guardians of female students think that trade school is more appropriate for men.

Father/Male Guardian's Perceived Opinion: Which Gender Trade School is Appropriate For, Comparing Female and Male Student Responses



Female Student Responses

Male Student Responses

Figure 9a, Figure 9b. The histogram on the left (Figure 9a) shows female students' perceptions of their mother/female guardians' opinion towards which gender they think trade school is appropriate for. This histogram being left-skewed tells us that mothers/female guardians of female students think trade school is more appropriate for men. The histogram on the right (Figure 9b) shows male students' perceptions of their mother/female guardians' opinion towards which gender they think trade school is appropriate for. This histogram being fairly evenly disbursed tells us that mothers/female guardians of male students think trade school is more equally appropriate for men and women.

Unexpectedly, we were unable to find any evidence to support our hypothesis that college students would pursue the post-graduate path that they have a more positive perception of and expect to have the most positive life outcomes (Appendix B). This rationale was a big motivator behind our hypotheses. We expected this to be supported by the survey data but there was no statistically significant evidence that this was true. We looked at many variables when testing this hypothesis including students' confidence that their education would allow them to obtain a well-paying job (Pay variable), obtain a job they like doing (Job_Like variable), be respected by others (Respected variable), have enough time to have a family, friends, and leisure time (Free_Time variable), and better achieve their goals (Goals variable). Summary statistics from these multiple hypothesis tests can be found in Figure 10 below. Five is the chosen value for these hypothesis tests because all the scales for these survey questions were on a scale of zero to nine in which five represents a neutral opinion on the scale. As you can see from the table below, all the p-values for the hypothesis tests are greater than 0.75. This indicates that there is little evidence in the sample population that the mean value is not equal to five. From these hypothesis tests we determined that there is not significant evidence that students pursue the post-graduate path that they expect to have the most positive life outcomes.

Variable Name	Pay	Job_Like	Respected	Free_Time	Goals
Null Hypothesis	$\mu = 5$ (neutral)	$\mu = 5$ (neutral)	$\mu = 5$ (neutral)	$\mu = 5$ (neutral)	$\mu = 5$ (neutral)
Mean	8.0333	7.4333	7.1667	6.3	7.9333
Z-score	2.8450	2.1437	1.3369	0.7367	2.4413
p-value	0.9978	0.9840	0.9094	0.7694	0.9927

Figure 10. Summary of various statistics including mean, Z-score, and p-value from multiple hypothesis tests.

Regression

Regression analysis was used in the data analysis to determine which factor has the largest influence on post-graduate decisions. To aid in variable selection, we employed stepwise regression. Within R we used the step and lm functions to perform the stepwise regression. The y-variable that we were using in the regression was a "success score" comprised of an average of three variables including students' belief that their education would make them better able to achieve their goals, do well in life, and be well respected by others (see Equation 1 below). These variables were chosen as the y-variables for this regression because they are all good indicators of someone's success after they graduate. After running this regression model using R, we were left with only two variables that had the largest impact on the y-variable.

$$\text{"Success Score"} = \frac{\text{Achieve Goals} + \text{Do Well in Life} + \text{Be Respected}}{3} \quad (1)$$

Results From Performing Stepwise Regression

```
Call:
lm(formula = success.score ~ college.M_College + college.F_College,
    data = New_Data_regression_success)

Residuals:
    Min      1Q  Median      3Q     Max
-2.6982 -0.3225  0.2888  0.6352  1.3018

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       6.39718    0.88844   7.200 9.61e-08 ***
college.M_College 0.05752    0.01896   3.033   0.0053 **
college.F_College -0.03150   0.01489  -2.116   0.0437 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9697 on 27 degrees of freedom
Multiple R-squared:  0.2613,    Adjusted R-squared:  0.2066
F-statistic: 4.776 on 2 and 27 DF,  p-value: 0.01675
```

Figure 11. This is the output from R after running the regression. The two variables that had the largest impact on the "success score" y-variable are M_College (the students' perception of the gender that their father/male guardian thinks college is appropriate for) and F_College (the students' perception of the gender that their mother/female guardian thinks college is appropriate for). The father/male guardian's perceived opinion had a positive relationship with the "success score," while the mother/female guardian's perceived opinion had a negative relationship with the "success score." The adjusted R-squared value is 20.66%, indicating that only 20.66% of the variation in the "success score" y-variable can be explained by the variation in the x-variables. While there is a weak relationship between these variables, it is a significant one due to the p-value of 0.01675.

Our original hypothesis was that outcome expectations would have the largest impact on post-graduate decisions. However, the two variables that the regression determined that have the largest impact on the "success score" variable were the students' perception of the gender that their father/male guardian thinks college is appropriate for (M_College variable) and the students' perception of the gender that their mother/female guardian thinks college is appropriate for (F_College variable) (see Figure 11). The father/male guardian's perceived

opinion had a positive relationship with the "success score," while the mother/female guardian's perceived opinion had a negative relationship with the "success score.". The adjusted R-squared of this analysis is 20.66%. This means that only about 21% of the change in the y-variable can be explained by changes in the x-variables. This indicates that while there may not be the strongest relationship between these variables, it is a significant relationship, due to the p-value of 0.01675. This indicates that there is potentially a relationship between the gender that students perceive their parents to think college is appropriate for and the "success score."

CONCLUSIONS /NEXT STEPS

The first conclusion to repeat from our data analysis is that we did not find significant evidence that students will pursue the post-graduate path that they have a more positive perception of and expect to have the most positive life outcomes. Some evidence was found by hypothesis testing to support that parents'/guardians' perceived opinion is that trade school is not equally appropriate for both genders. A potential relationship was found through the regression analysis between the perceived gender that parents/guardians think college is appropriate for and the "success score." Overall, my thesis was able to supplement existing literature concerning the influence of various factors on post-graduate decisions. The main takeaway from this contribution is that students' perceptions of their parents'/guardians' opinions are motivating their decision-making. We found that gender plays a role in this as well. For example, we learned that the perceived opinion of parents/guardians of female students is that trade school is more appropriate for men. In this example, the gender of the student is playing a role in the gravity of the perceived gender stereotype. We also learned that fathers/male guardians of female students more strongly believe that trade school is for men than mothers/female guardians. This example illustrates the impact that the gender of the parent has on gender stereotypes.

Further research is necessary to understand the technical school population and how various factors affect their post-graduate decisions. As previously mentioned, I was unable to do this in my analysis, but future researchers could compare data between college and technical

school students. It would be interesting to learn if there are any differences in outcome expectations between college and technical high school students. One could also study if a parent/guardian attending technical school has an effect that their child will also attend technical school. Comparing the perceived opinions of parents/guardians of technical high school students concerning which gender each post-graduate path is appropriate for to those of college students may also help gain a broader understanding of parents/guardians perceived gender stereotypes.

While this thesis covered many different factors that affect post-graduate decisions, it did not include them all. Future research can include other factors such as socioeconomic status, parents'/guardians' education level, and parents'/guardians' career field which may influence students' post-graduate decisions. Socioeconomic status, in particular, was one factor that was continuously mentioned in the literature as possibly having an effect on the post-graduate path that a student pursues. For example, Turner et al.'s (2019) study of whether socioeconomic status, barriers, and support would predict self-efficacy and outcome expectations concluded that socioeconomic status predicts outcome expectations. It was also identified in Adnett and Slack (2007) that students of a lower socioeconomic status tend not to enter higher academic education. Since there is already literature that points to socioeconomic status as a possible influence on post-graduate decisions, it may be a worthwhile influence on students' career decision-making.

Another topic that would be interesting for future researchers to analyze is the effect of having children of different genders on parents'/guardians' gender stereotypes. For example, perhaps having children of different genders that both attend either college or technical school would lessen parents'/guardians' perceived opinions about which gender those educational pathways are appropriate for. While we were able to learn a lot about how parents'/guardians' perceived opinions affect one child of a certain gender, there might be a difference in parents'/guardians' perceived opinions if they have children of different genders.

APPENDICES

Appendix A – (Survey Questions)

Appendix A.1 – (Demographics)

- Age
    - Under 18
    - 18
    - 19
    - 20
    - 21
    - 22
    - Over 22
- What is your gender?
    - Male
    - Female
    - Non-binary / third gender
    - Other: _____
    - Prefer not to say
- What is your race/ethnicity?
    - African American / African / Black / Caribbean
    - Asian / Pacific Islander
    - Caucasian
    - Hispanic / Latino
    - Native American
    - Other: _____
    - Prefer not to say
- What school do you attend?
    - E. C. Goodwin Technical High School
    - Bryant University

- Other: _____
- I do not go to school

Appendix A.2 – (College question)

- Are you a first-generation college student?
  - Yes
  - No
  - I don't know

Appendix A.3 – (Mother/Female Guardian Information)

- What is your mother/female guardian's highest achieved education level? (College-Going Self-Efficacy Scale)
  - Some high school
  - High school
  - Less than a 4-year degree
  - 4-year degree
  - Master's degree or higher
  - Education level unknown
  - Not applicable/Do not have a mother or female guardian
- What is your mother/female guardian's occupation?
  - _____
- Please indicate your mother/female guardian's opinions regarding gender for the following scenarios. Here: 0 indicates only appropriate for males, 100 indicates only appropriate for females, 50 indicates a neutral opinion with regard to gender. (Modified Gender Role Attitudes Scale (GRAS))
  - College is appropriate for
  - Vocational/Technical Education is appropriate for
- Please indicate your mother/female guardian's opinions regarding YOUR abilities for the following scenarios. Here: 0 indicates weak/low abilities, 100 indicates strong/high abilities, 50 indicates neutral/no opinion about abilities. If you are a college student,

please disregard the "abilities to get good marks in vocational/trade classes" question. (Modified Sources of Science and Technology Self-Efficacy Scale)

- Abilities to get good marks in academic classes
- Abilities to get good marks in vocational/trade classes

- Which statement most accurately describes your mother/female guardian's opinion about your education? (College-Going Self-Efficacy Scale)
  - Strongly preferred I attend trade/vocational school
  - Strongly preferred I attend college
  - Preferred I attend trade/vocational school
  - Preferred I attend college
  - Preferred I did not attend either trade/vocational school or college
  - No opinion

Appendix A.4 – (Father/Male Guardian Information)

- What is your father/male guardian's highest achieved education level? (College-Going Self-Efficacy Scale)
  - Some high school
  - High school
  - Less than a 4-year degree
  - 4-year degree
  - Master's degree or higher
  - Education level unknown
  - Not applicable/Do not have a father or male guardian
- What is your father/male guardian's occupation?
  - _____
- Please indicate your father/male guardian's opinions regarding gender for the following scenarios. Here: 0 indicates only appropriate for males, 100 indicates only appropriate for females, 50 indicates a neutral opinion with regard to gender. (Modified Gender Role Attitudes Scale (GRAS))

  - College is appropriate for
  - Vocational/Technical Education is appropriate for
- Please indicate your father/male guardian's opinions regarding YOUR abilities for the following scenarios. Here: 0 indicates weak/low abilities, 100 indicates strong/high abilities, 50 indicates neutral/no opinion about abilities. If you are a college student, please disregard the "abilities to get good marks in vocational/trade classes" question. (Modified Sources of Science and Technology Self-Efficacy Scale)
  - Abilities to get good marks in academic classes
  - Abilities to get good marks in vocational/trade classes
- Which statement most accurately describes your father/male guardian's opinion about your education? (College-Going Self-Efficacy Scale)
  - Strongly preferred I attend trade/vocational school
  - Strongly preferred I attend college
  - Preferred I attend trade/vocational school
  - Preferred I attend college
  - Preferred I did not attend either trade/vocational school or college
  - No opinion

Appendix A.5 – (School Questions)

- How useful do you think the contents of your courses will be for your future career? (Modified Expectancy-Value Questionnaire (EVQ))
  - Not at all useful
  - Slightly useful
  - Moderately useful
  - Very useful
  - Extremely useful
- Please state how strongly you agree or disagree with the following statements. Here 0 means you strongly disagree, 9 means you strongly agree. (Modified College Outcome Expectation Questionnaire (COE))

- My education will allow me to obtain a well-paying job
- My education will allow me to obtain a job I like doing
- With my education, I will be respected by others
- My education will leave me enough time to have things like a family, friends, and leisure time
- My education will make me better able to achieve my career goals
- My education will allow me to do well in life

Appendix A.6 – (Career Decision Making)

- Please state your own level of confidence that you would be able to complete each of the following tasks as you think about your career. Here 0 means you have no confidence in your own ability, 9 means you have complete confidence in your own ability. (Career Decision-Making Self-Efficacy Scale-Short Form (CDMSE))
  - Accurately assess your abilities
  - Choose a career that will fit your preferred lifestyle
  - Decide what you value most in an occupation
  - Choose a career that will fit your interests
  - Talk with a person already employed in the field you are interested in
- Please state how strongly you agree or disagree with the following statements. Here 0 means you strongly disagree, 9 means you strongly agree. (Modified Employability Scale)
  - Employers are eager to employ graduates from my school
  - People in the career I am aiming for are in high demand in the external labour market
  - My degree is seen as leading to a specific career that is generally perceived as highly desirable
  - I can easily find out about opportunities in my chosen field
  - I feel I could get any job so long as my skills and experience are reasonably relevant

Appendix A.7 – (Gender Roles)

- Please state how strongly you agree or disagree with the following statements. Here 0 means you strongly disagree, 9 means you strongly agree. (Modified Gender Role Attitudes Scale (GRAS))
    - In my social circle, my future domestic activity is considered more important than my professional activity
    - I think that it is right that, in my social circle, my future domestic activity is considered more important than my professional activity
    - Some jobs are not appropriate for men
    - Some jobs are not appropriate for women

Appendix B – (R Code)

```
### importing and prepping data

# install.packages("readxl")

library(readxl)

Data <- read_excel("G:/My Drive/Bryant/Senior Year  )/Honors Thesis/Thesis Data/New Survey Results Final.xlsx")



# null hypothesis: the mean a quantitative variable in population 1 is equal to the mean of a quantitative variable in population 2

# alternative hypothesis: the mean of a quantitative variable in population 1 is not equal to the mean of a quantitative variable in population 2



### INCLUDE THESE IN CAPTION FOR FIGURES OF DISTRUBITIONS



# Abilities, Preferred_Lifestyle, Values, Interests

# males vs females

# null: the mean of responses concerning self-efficacy is equal to 5 (neutral)

# alt: the mean of responses concerning self-efficacy is not equal to 5 (neutral)



# Abilities, Preferred_Lifestyle, Values, Interests

# technical school only

# null: the mean of responses concerning self-efficacy is equal to 5 (neutral)

# alt: the mean of responses concerning self-efficacy is not equal to 5 (neutral)
```

```
# Abilities

# college only

# null: the mean response for female college students is equal to the mean response for male college students concerning confidence in abilities

# alt: the mean response for female college students is not equal to the mean response for male college students concerning confidence in abilities

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Abilities)

z = 1.351970923

p = pnorm(z)

p = .911807691384604

# p = .088192309

# 2-sided p = .17638461

# p > .05

# fail to reject the null

hist(college$Abilities, xlim=c(0,9), breaks=seq(0,9,1))


# Preferred_Lifestyle

# college only

# null: the mean response for female college students is equal to the mean response of male college students concerning the match of preferred lifestyle to career
```

alt: the mean response for female college students is not equal to the mean response of male college students concerning the match of preferred lifestyle to career

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Preferred_Lifestyle)

z = -.066135171

p = pnorm(z)

p = .473635104863045

p > .05

fail to reject the null

hist(college$Preferred_Lifestyle, xlim=c(0,9), breaks=seq(0,9,1))

Values

college only

null: the mean response for female college students is equal to the mean response for male college students concerning confidence in deciding what they value most in a job

alt: the mean response for female college students is not equal to the mean response for male college students concerning confidence in deciding what they value most in a job

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Values)

z = .925444016

p = pnorm(z)

```
p = .822632503971257

# p > .05

# fail to reject the null

hist(college$Values, xlim=c(0,9), breaks=seq(0,9,1))



# Interests

# college only

# null: the mean number of female college students is equal to the mean number of male college students concerning confidence in choosing a career that interests them

# alt: the mean number of female college students is not equal to the mean number of male college students concerning confidence in choosing a career that interests them

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Interests)

z = .462615108

p = pnorm(z)

p = .678179861272055

# p > .05

# fail to reject the null

hist(college$Interests, xlim=c(0,9), breaks=seq(0,9,1))



# F_College

# college only
```

```
# null: the mean number of female responses is equal to the mean number of male responses concerning gender that their mother/female guardian thinks college is appropriate for

# alt: the mean number of female responses is not equal to the mean number of male responses concerning gender that their mother/female guardian thinks college is appropriate for

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$F_College)

z = -.252096771

p = pnorm(z)

p = .400483132875668

# p > .05

# fail to reject the null

hist(college$F_College, xlim=c(0,100), breaks=seq(0,100,10))



# F_Trade

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning gender that their mother/female guardian thinks trade school is appropriate for

# alt: the mean number of female responses is not equal to the mean number of male responses concerning gender that their mother/female guardian thinks trade school is appropriate for

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

#trying to make female dataset
```

```
female.ind = which(college$Gender=="Female")

female <- college[female.ind,]

#trying to make male dataset

male.ind = which(college$Gender=="Male")

male <- college[male.ind,]

table(college$F_Trade)

z = -.920994524

p = pnorm(z)

p = .17852664300243

# p > .05

# fail to reject the null

hist(female$F_Trade, xlim=c(0,100), breaks=seq(0,100,10))

hist(male$F_Trade, xlim=c(0,100), breaks=seq(0,100,10))



# M_College

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning gender that their father/male guardian thinks college is appropriate for

# alt: the mean number of female responses is not equal to the mean number of male responses concerning gender that their father/male guardian thinks college is appropriate for

college.ind = which(Data$School=="C")

college <- Data[college.ind,]
```

```
table(college$M_College)

z = -.237604055

p = pnorm(z)

p = .406094102571406

# p > .05

# fail to reject the null

hist(college$M_College, xlim=c(0,100), breaks=seq(0,100,10))



# M_Trade

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning gender that their father/male guardian thinks trade school is appropriate for

# alt: the mean number of female responses is not equal to the mean number of male responses concerning gender that their father/male guardian thinks trade school is appropriate for

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

#trying to make female dataset

male.ind = which(college$Gender=="Male")

male <- college[male.ind,]

# trying to make a dataset for female students

female.ind = which(college$Gender=="Female")

female <- college[female.ind,]
```

```
table(college$M_Trade)

z = -1.727465449

p = pnorm(z)

p = .0420420525828878

# p < .05

# reject the null

hist(male$M_Trade, xlim=c(0,100), breaks=seq(0,100,10))

hist(female$M_Trade, xlim=c(0,100), breaks=seq(0,100,10))



# Pay

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning the confidence that their education will allow them to find a well-paying job

# alt: the mean number of female responses is not equal to the mean number of male responses concerning the confidence that their education will allow them to find a well-paying job

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Pay)

z = 1.175107258

p = pnorm(z)

p = .880024096358231

# p > .05
```

```
# fail to reject the null

hist(college$Pay, xlim=c(0,9), breaks=seq(0,9,1))



# Any_Job

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning the confidence that they could get any job

# alt: the mean number of female responses is not equal to the mean number of male responses concerning the confidence that they could get any jo

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Any_Job)

z = .23954416

p = pnorm(z)

p = .594658170880577

# p > .05

# fail to reject the null

hist(college$Any_Job, xlim=c(0,9), breaks=seq(0,9,1))



# Employer_Interest

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning employers being eager to employ graduates from the school
```

```
# alt: the mean number of female responses is not equal to the mean number of male responses concerning employers being eager to employ graduates from the school

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Employer_Interest)

z = 2.074859767

p = pnorm(z)

p = .981000233279783

# p > .05

# fail to reject the null

hist(college$Employer_Interest, xlim=c(0,9), breaks=seq(0,9,1))



# Career_Demand

# college only

# null: the mean number of female responses is equal to the mean number of male responses concerning their career being in high demand in the market

# alt: the mean number of female responses is not equal to the mean number of male responses concerning their career being in high demand in the market

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Career_Demand)

z = .923669932

p = pnorm(z)
```

```
p = .822170904227056

# p > .05

# fail to reject the null

hist(college$Career_Demand, xlim=c(0,9), breaks=seq(0,9,1))



# gender and school - college students only

# null: 50% of the college student respondents are female

# alt: not 50% of the college student respondents are female

# ran it using female %

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Gender)

z = .365148372

p = pnorm(z)

p = .642499672779074

# p = .357500327

# 2-sided p = .715000654

# p > .05

# fail to reject the null


# gender and school - college students only
```

```
# null: 50% of the college student respondents are male

# alt: not 50% of the college student respondents are male

# ran it using male %

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Gender)

z = -.365148372

p = pnorm(z)

p = .357500327220926

# 2-sided p = .715000654

# p > .05

# fail to reject the null



# Abilities, Preferred_Lifestyle, Values, Interests

# males vs females

# null: the mean of responses concerning self-efficacy is equal to 5 (neutral)

# alt: the mean of responses concerning self-efficacy is not equal to 5 (neutral)

# will I have to separate the different variables?
```

```
# Abilities, Preferred_Lifestyle, Values, Interests

# technical school only

# null: the mean of responses concerning self-efficacy is equal to 5 (neutral)

# alt: the mean of responses concerning self-efficacy is not equal to 5 (neutral)

# will I have to separate the different variables?


# Abilities

# college only

# null: the mean of responses concerning confidence in abilities is equal to 5 (neutral)

# alt: the mean of responses concerning confidence in abilities is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Abilities)

z = 1.479831645

p = pnorm(z)

p = .930540909367257

# p = .069459091

# 2-sided p = .138918181

# p > .05

# fail to reject the null

hist(college$Abilities, xlim=c(0,9), breaks=seq(0,9,1))
```

```
# Preferred_Lifestyle

# college only

# null: the mean of responses concerning the match of preferred lifestyle to career is equal to 5 (neutral)

# alt: the mean of responses concerning the match of preferred lifestyle to career is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Preferred_Lifestyle)

z = 2.482651174

p = pnorm(z)

p = .993479563990509

# p = .006520436

# 2-sided p = .013040872

# p < .05

# reject the null

hist(college$Preferred_Lifestyle, xlim=c(0,9), breaks=seq(0,9,1))



# Values

# college only

# null: the mean of responses concerning confidence in deciding what they value most in a job is equal to 5 (neutral)

# alt: the mean of responses concerning confidence in deciding what they value most in a job is not equal to 5 (neutral)
```

```
college.ind = which(Data$School=="C"

college <- Data[college.ind,]

table(college$Values)

z = 1.398663017

p = pnorm(z)

p = .919042970283858

# p = .08095703

# 2-sided p = .161914059

# p > .05

# fail to reject the null

hist(college$Values, xlim=c(0,9), breaks=seq(0,9,1))



# Interests

# college only

# null: the mean of responses concerning confidence in choosing a career that interests them is equal to 5 (neutral)

# alt: the mean of responses concerning confidence in choosing a career that interests them is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Interests)

z = 1.922387896

p = pnorm(z)
```

p = .972721516264663

p = .027278484

2-sided p = .054556967

p > .05

fail to reject the null

hist(college$Interests, xlim=c(0,9), breaks=seq(0,9,1))

First_Gen

college students only

null: 50% of the college student respondents are first generation college students

alt: not 50% of the college student respondents are first generation college students

ran it using first generation (yes) %

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$First_Gen)

z = -4.016632088

p = pnorm(z)

p = .0000295178902944163

2-sided p = .000059036

# p < .05

reject the null

hist(college$First_Gen, xlim=c(0,9), breaks=seq(0,9,1))

```
# F_College

# college only

# null: the mean of responses concerning gender that their mother/female guardian's thinks college is appropriate for is equal to 50 (neutral)

# alt: the mean of responses concerning gender that their mother/female guardian's thinks college is appropriate for is not equal to 50 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$F_College)

z = .140051684

p = pnorm(z)

p = .555690422586201

# p = .444309577

# 2-sided p = .888619155

# p > .05

# fail to reject the null

hist(college$F_College, xlim=c(0,100), breaks=seq(0,100,10))



# F_Trade

# college only

# null: the mean of responses concerning gender that their mother/female guardian's thinks trade school is appropriate for is equal to 50 (neutral)
```

alt: the mean of responses concerning gender that their mother/female guardian's thinks trade school is appropriate for is not equal to 50 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$F_Trade)

z = -.117360345

p = pnorm(z)

p = .453287253481875

2-sided p = .906574507

p > .05

fail to reject the null

hist(college$F_Trade, xlim=c(0,100), breaks=seq(0,100,10))

M_College

college only

null: the mean of responses concerning gender that their father/male guardian's thinks college is appropriate for is equal to 50 (neutral)

alt: the mean of responses concerning gender that their father/male guardian's thinks college is appropriate for is not equal to 50 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$M_College)

z = .169481269

p = pnorm(z)

p = .567290947797556

p = .432709052

2-sided p = .865418104

p > .05

fail to reject the null

hist(college$M_College, xlim=c(0,100), breaks=seq(0,100,10))

M_Trade

college only

null: the mean of responses concerning gender that their father/male guardian's thinks trade school is appropriate for is equal to 50 (neutral)

alt: the mean of responses concerning gender that their father/male guardian's thinks trade school is appropriate for is not equal to 50 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$M_Trade)

z = -.364854509

p = pnorm(z)

p = .35761000668075

p = .715220013

p > .05

fail to reject the null

```
hist(college$M_Trade, xlim=c(0,100), breaks=seq(0,100,10))



# Pay

# college only

# null: the mean of responses concerning the confidence that their education will allow them to find a well-paying job is equal to 5 (neutral)

# alt: the mean of responses concerning the confidence that their education will allow them to find a well-paying job is not equal to 5 (neutral)gender that their father/male guardian's thinks trade school is appropriate for is not equal to 50 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Pay)

z = 2.844995724

p = pnorm(z)

p = .99777939903735

# p > .05

# fail to reject the nul

hist(college$Pay, xlim=c(0,9), breaks=seq(0,9,1))



# Job_like

# college only

# null: the mean of responses concerning the confidence that their education will allow them to find a job that they like is equal to 5 (neutral)
```

```
# alt: the mean of responses concerning the confidence that their education will allow them to find a job that they like is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Job_Like)

z = 2.143672445

p = pnorm(z)

p = .983970429221524

# p > .05

# fail to reject the null

hist(college$Job_Like, xlim=c(0,9), breaks=seq(0,9,1))



# Respected

# college only

# null: the mean of responses concerning the confidence that their education will allow them to be respected in their career is equal to 5 (neutral)

# alt: the mean of responses concerning the confidence that their education will allow them to be respected in their career is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Respected)

z = 1.336929869

p = pnorm(z)
```

p = .909377235027262

p > .05

fail to reject the nul

hist(college$Respected, xlim=c(0,9), breaks=seq(0,9,1))

Free_Time

college only

null: the mean of responses concerning the confidence that their career will allow them to have free time is equal to 5 (neutral)

alt: the mean of responses concerning the confidence that their career will allow them to have free time is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Free_Time)

z = 0.736713242

p = pnorm(z)

p = .769351623839172

p > .05

fail to reject the null

hist(college$Free_Time, xlim=c(0,9), breaks=seq(0,9,1))

Goals

college only

```
# null: the mean of responses concerning the confidence that their education will allow them to better achieve their goals is equal to 5 (neutral)

# alt: the mean of responses concerning the confidence that their education will allow them to better achieve their goals is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Goals)

z = 2.441328516

p = pnorm(z)

p = .992683331857911

# p > .05

# fail to reject the null

hist(college$Goals, xlim=c(0,9), breaks=seq(0,9,1))



# Any_Job

# college only

# null: the mean of responses concerning the confidence that they could get any job is equal to 5 (neutral)

# alt: the mean of responses concerning the confidence that they could get any job is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Any_Job)

z = 1.275472175
```

p = pnorm(z)

p = .898928916669812

p = .101071083

2-sided p = .202142167

p > .05

fail to reject the null

hist(college$Any_Job, xlim=c(0,9), breaks=seq(0,9,1))

Employer_Interest

college only

null: the mean of responses concerning employers being eager to employ graduates from the school is equal to 5 (neutral)

alt: the mean of responses concerning employers being eager to employ graduates from the school is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Employer_Interest)

z = 1.88011326

p = pnorm(z)

p = .969953678157453

p = .030046322

2-sided p = .060092644

p > .05

```
# fail to reject the null

hist(college$Employer_Interest, xlim=c(0,9), breaks=seq(0,9,1))



# Career_Demand

# college only

# null: the mean of responses concerning their career being in high demand in the market is equal to 5 (neutral)

# alt: the mean of responses concerning their career being in high demand in the market is not equal to 5 (neutral)

college.ind = which(Data$School=="C")

college <- Data[college.ind,]

table(college$Career_Demand)

z = 1.476043794

p = pnorm(z)

p = .930033932010062

# p = .069966068

# 2-sided p = .139932136

# p > .05

# fail to reject the null

hist(college$Career_Demand, xlim=c(0,9), breaks=seq(0,9,1))



# ordered factors code
```

```
# install leaps package

#library("leaps")



# ordered F_Opinion

F_Opinion_ord <- factor(college$F_Opinion, levels=c("Strongly preferred I attend
trade/vocational school", "Preferred I attend trade/vocational school", "No opinion",
"Preferred I did not attend either trade/vocational school or college", "Preferred I attend
college", "Strongly preferred I attend college"), ordered = TRUE)

# length(F_Opinion_ord)



# ordered F_Ed

F_Ed_ord <- factor(college$F_Ed, levels=c("Some high school", "High school", "Less than a
4-year degree", "4-year degree", "Master's degree or higher"),labels = c("Some high school",
"High school", "Less than a 4-year degree", "4-year degree", "Master's degree or higher"),
ordered = is.ordered(college$F_Ed))



# ordered M_Ed

M_Ed_ord <- factor(college$M_Ed, levels=c("Some high school", "High school", "Less than
a 4-year degree", "4-year degree", "Master's degree or higher"),labels = c("Some high
school", "High school", "Less than a 4-year degree", "4-year degree", "Master's degree or
higher"), ordered = is.ordered(college$M_Ed))



# ordered M_Opinion

M_Opinion_ord <- factor(college$M_Opinion, levels=c("Strongly preferred I attend
trade/vocational school","Preferred I attend trade/vocational school", "No opinion", "Preferred
I did not attend either trade/vocational school or college", "Preferred I attend college",
"Strongly preferred I attend college"),labels = c("Strongly preferred I attend trade/vocational
school", "Preferred I attend trade/vocational school", "No opinion", "Preferred I did not attend
```

```
either trade/vocational school or college", "Preferred I attend college", "Strongly preferred I attend college"), ordered = is.ordered(college$F_Opinion))



# ordered Useful

Useful_ord <- factor(college$Useful, levels=c("Not at all useful", "Slightly useful", "Moderately useful", "Very useful", "Extremely useful"),labels = c("Not at all useful", "Slightly useful", "Moderately useful", "Very useful", "Extremely useful"), ordered = is.ordered(college$Useful))



# new dataset with ordered factors and getting rid of variables didn't use (college only)

# add Useful_ord, M_Opinion_ord, F_Opinion_ord, M_Ed_ord, F_Ed_ord

# subtract Age, F_Occ, M_Occ, School



# all

New_Data_all <- data.frame(college$Gender, college$Race_Ethnicity, college$First_Gen, F_Ed_ord, college$F_College, college$F_Trade, college$F_Academic, college$F_Vocational, F_Opinion_ord, M_Ed_ord, college$M_College, college$M_Trade, college$M_Academic, college$M_Vocational, M_Opinion_ord, Useful_ord, college$Pay, college$Job_Like, college$Respected, college$Free_Time, college$Goals, college$Well_in_Life, college$Abilities, college$Preferred_Lifestyle, college$Values, college$Interests, college$Network, college$Employer_Interest, college$Career_Demand, college$Desirable_Career, college$Opportunities, college$Any_Job, college$Domestic, college$Opinion_Domestic, college$No_M, college$No_F, fix.empty.names = TRUE)



# only ones use in regression we want to use

# New_Data_regression <- data.frame(college$Gender, college$Race_Ethnicity, college$First_Gen, F_Ed_ord, college$F_College, college$F_Trade, F_Opinion_ord, M_Ed_ord, college$M_College, college$M_Trade, M_Opinion_ord, Useful_ord, college$Pay, college$Job_Like, college$Respected, college$Free_Time, college$Goals, college$Well_in_Life, college$Abilities, college$Network, college$Employer_Interest,
```

college$Career_Demand, college$Opportunities, college$Any_Job, college$No_M, college$No_F, fix.empty.names = TRUE)

minus F_Opinion_ord, M_Opinion_ord

New_Data_regression <- data.frame(college$Gender, college$Race_Ethnicity, college$First_Gen, F_Ed_ord, college$F_College, college$F_Trade, M_Ed_ord, college$M_College, college$M_Trade, Useful_ord, college$Pay, college$Job_Like, college$Respected, college$Free_Time, college$Goals, college$Well_in_Life, college$Abilities, college$Network, college$Employer_Interest, college$Career_Demand, college$Opportunities, college$Any_Job, college$No_M, college$No_F, fix.empty.names = TRUE)

minus F_Opinion_ord, M_Opinion_ord, F_Ed_ord, M_Ed_ord

New_Data_regression <- data.frame(college$Gender, college$Race_Ethnicity, college$First_Gen, college$F_College, college$F_Trade, college$M_College, college$M_Trade, Useful_ord, college$Pay, college$Job_Like, college$Respected, college$Free_Time, college$Goals, college$Well_in_Life, college$Abilities, college$Network, college$Employer_Interest, college$Career_Demand, college$Opportunities, college$Any_Job, college$No_M, college$No_F, fix.empty.names = TRUE)

minus F_Opinion_ord, M_Opinion_ord, F_Ed_ord, M_Ed_ord, Useful_ord

New_Data_regression <- data.frame(college$Gender, college$Race_Ethnicity, college$First_Gen, college$F_College, college$F_Trade, college$M_College, college$M_Trade, college$Pay, college$Job_Like, college$Respected, college$Free_Time, college$Goals, college$Well_in_Life, college$Abilities, college$Network, college$Employer_Interest, college$Career_Demand, college$Opportunities, college$Any_Job, college$No_M, college$No_F, fix.empty.names = TRUE)

minus F_Opinion_ord, M_Opinion_ord, F_Ed_ord, M_Ed_ord, Useful_ord, college$Abilities, college$Network, college$Employer_Interest, college$Career_Demand, college$Opportunities, college$No_M, college$No_F

```
# New_Data_regression <- data.frame(college$Gender, college$Race_Ethnicity,
college$First_Gen, college$F_College, college$F_Trade, college$M_College,
college$M_Trade, college$Pay, college$Job_Like, college$Respected, college$Free_Time,
college$Goals, college$Well_in_Life, college$Any_Job, fix.empty.names = TRUE)



# minus F_Opinion_ord, M_Opinion_ord, F_Ed_ord, M_Ed_ord, Useful_ord,
college$Abilities, college$Network, college$Employer_Interest, college$Career_Demand,
college$Opportunities, college$No_M, college$No_F

New_Data_regression <- data.frame(college$Gender, college$Race_Ethnicity,
college$First_Gen, college$F_College, college$F_Trade, college$M_College,
college$M_Trade, college$Pay, college$Job_Like, college$Respected, college$Free_Time,
college$Goals, college$Well_in_Life, college$Any_Job, fix.empty.names = TRUE)



# minus all categorical variables

#New_Data_regression <- data.frame(college$F_College, college$F_Trade,
college$M_College, college$M_Trade, college$Pay, college$Job_Like, college$Respected,
college$Free_Time, college$Goals, college$Well_in_Life, college$Any_Job,
fix.empty.names = TRUE)



# success score using avg of Goals, Respected, Well_in_Life

success.score=(New_Data_regression$college.Goals+New_Data_regression$college.Well_in
_Life+New_Data_regression$college.Respected)/3



# with success.score, minus F_Opinion_ord, M_Opinion_ord, F_Ed_ord, M_Ed_ord,
Useful_ord, college$Abilities, college$Network, college$Employer_Interest,
college$Career_Demand, college$Opportunities, college$No_M, college$No_F



# minus Goals, Well_in_Life, Respected
```

```
#New_Data_regression_success <- data.frame(college$Gender, college$Race_Ethnicity,
college$First_Gen, college$F_College, college$F_Trade, college$M_College,
college$M_Trade, college$Pay, college$Job_Like, college$Free_Time, college$Any_Job,
success.score, fix.empty.names = TRUE)



# with success.score, minus F_Opinion_ord, M_Opinion_ord, F_Ed_ord, M_Ed_ord,
Useful_ord, college$Abilities, college$Network, college$Employer_Interest,
college$Career_Demand, college$Opportunities, college$No_M, college$No_F

# minus Goals, Well_in_Life, Respected

# minus Pay, Job_Like, Free_Time, Any_Job



New_Data_regression_success <- data.frame(college$Gender, college$Race_Ethnicity,
college$First_Gen, college$F_College, college$F_Trade, college$M_College,
college$M_Trade, success.score, fix.empty.names = TRUE)



# full linear model

full_model <- lm(success.score ~ ., data = New_Data_regression_success)

intercept_model <- lm(success.score ~ 1, data = New_Data_regression_success)

both <- step(intercept_model, direction='both', scope=formula(full_model), trace=0)



# full model

full_model_original <- lm(college.Well_in_Life ~ ., data = New_Data_all)

intercept_model <- lm(college.Well_in_Life ~ 1, data = New_Data_all)

both <- step(intercept_model, direction='both', scope=formula(full_model_original), trace=0)
```

```
# summary(both)

both$anova

both$coefficients



# regression with only these

only_success_model <- lm(success.score ~ college.M_College+college.F_College, data =
New_Data_regression_success)

summary(only_success_model)
```

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