THE PROBLEM OF MAJOR CHANGING:

ITS ROLE AND EFFECTS ON POSTSECONDARY EXPERIENCES OF GIFTED STUDENTS

A Dissertation

by

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ABSTRACT

Most college students change their major at least once, but many college students change their major frequently throughout their postsecondary education. In the current literature, there is no consideration of possible negative effects—particularly stress—frequent major changing has on college students in this already tumultuous time in their lives. Furthermore, there is no consideration of these potential effects on a subgroup of the student population whose members are predisposed to higher levels of stress than the average student—the intellectually gifted.

In this exploratory study, I consider potential negative effects of major changing and the possibility of poor college and career counseling while in high school as a predictor of major changing. Gifted and non-gifted subsamples are compared. Participants in this study were 1,047 students from a large southern university who responded to an online survey. Comparisons between the two subsamples are made using *t*-tests, and regression analyses are used to explore the relationship between postsecondary guidance counseling and major changing. Results indicate that though there are relatively few significant differences between the two subsamples in their major changing trends, participation in postsecondary guidance counseling while in high school has different effects on the number of major changes made by students in these two groups.

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CHAPTER I

INTRODUCTION

The word "underrepresented"—as it pertains to students in the U.S. school system—typically brings to mind students from inner city schools, minority students, those from low socio-economic backgrounds, or students with disabilities. Because of the more obvious obstacles to academic success students in these groups face (i.e., general lack of resources, money, access to educational opportunities, cognitive deficits, etc.), they are the students that often receive the most attention and focus from policyholders and educators alike. Much less often do we consider the gifted population as an underrepresented group of students. In the field of education all too many people adopt the view that gifted students require fewer resources because they are predisposed to success (Greene, 2006; Peterson, 2009). We hear a number of familiar sentiments: *"These students are smart; they'll get into any college they want"* and *"These students don't need the guidance that other students need."* These adopted views are grossly incorrect, and the evidence to suggest so is overwhelming.

There is no universal definition for "giftedness" despite its long-standing presence in research and literature. Chen and Wong (2013) offer a definition that includes principles from a number of prominent gifted psychologists including Francoys Gagne, Joseph Renzulli, and Robert Sternberg:

> *Gifted individuals are described as people who possess exceptional capacity and aptitude in a range of performance domains, including but not limited to abilities*

to reason, to learn, to play, and to accomplish. These individuals demonstrate outstanding competence and skill attainment in structured area of activity with its own symbol system (e.g., mathematics, music, language) and/or set of sensorimotor skills (e.g., painting, dance, sports). They are the very top-tier performers and achievers, i.e., the top 5-10% among their peers in the same age group.

Underrepresentation of gifted students occurs both in and out of the classroom. Just a few of the many problems underlying their underrepresentation are underidentification (Carman & Taylor, 2010; Lewis et al., 2007; Warne, 2009); lack of teacher training (Monks & Pfluger, 2005); scarcity of adequate gifted programming in schools (Robertson, Pfeiffer, & Taylor, 2011); and lack of individualized guidance counseling of gifted students in secondary school (Elijah, 2011; Yoo & Moon, 2006). In considering the nature of these problem areas, one could arguably conclude that gifted students' education is essentially being ignored in relation to the education of other underrepresented groups. Due in part to being overlooked in this regard, many gifted students experience and exhibit social and emotional disorders (Coleman, 1996), disruptive behaviors (Chance & Chance, 1987), and their achievement in school tends to suffer (Hebert & Reis, 1999).

Among the typical qualities they espouse that make them prone to experiencing the aforementioned issues, many gifted students are characterized by another quality that is likely to affect their education in the end. *Multipotentiality*—a term coined by Frederickson and Rothney (1972)—refers to a person's ability to excel in two or more

different vocational areas based on their interests, aptitudes, and cognitive abilities. No part of this definition makes multipotentiality seem inherently negative, and in fact, some might argue that multipotentiality is a relatively desirable characteristic. However, some experts in giftedness agree that one major issue surrounding multipotentiality is that of "overchoice syndrome" (Rysiew, Shore, & Carson, 1994, p. 44), or the difficulty of choosing one college major or career because they have more than one equally viable option (e.g., Colangelo, 2002; Rysiew, Shore, & Leeb, 1999).

There is some disagreement within the field about the validity of multipotentiality. Some skeptics argue that evidence for multipotentiality in gifted students is "contradictory and often anecdotal" (Sajjadi, Rejskind, & Shore, 2001, p. 29). Others say multipotentiality is less an issue than poorly developed decision-making skills among gifted students (Berger, 1989). Addressing the first claim, Rysiew, Shore, and Leeb (1999) argue that "the existence of persistent clinical and anecdotal reports of multipotentiality and indecision in highly able youth…points to a need for continuing consideration of multipotentiality" (p. 424). In response to the second claim, Greene (2002) argues that decision-making is only an issue for gifted students when it is accompanied by having multiple interests, motivations, and opportunities, which, in essence, is what constitutes multipotentiality.

Problem Statement

Choosing a College Major

Gifted students, like their typical school peers, have interests relating to future college majors and/or career fields. Whereas their peers may be more likely to excel in

only one area—and thus choose a career path in that area—gifted students have the added burden of multipotentiality: the ability to excel in a number of different fields or positions. Furthering this problem is the idea that middle and high school students may not actually know what their interests are. Genuine interest entails more than simply "liking" certain aspects of a job or career. For example, in discussing future plans with a high school counselor a student might express interest in accounting. The reality may be that the student likes the idea of making the kind of money an accountant has the potential to earn rather than having a genuine interest in preparing and examining financial records. ACT (2013) published in a report that 80% of its test-takers reported knowing which major they would declare in college, of which only 36% of those students chose a major that fit their actual interests as defined by results of the ACT's interest inventory. This is a troublesome statistic, especially considering that interest is the number one reason students cite for choosing their first college major (Beggs, Bantham, & Taylor, 2008; Liao & Ji, 2015; Malgwi, Howe, & Burnaby, 2005).

When it comes to choosing a college major and maximizing satisfaction based on that decision, interest ideally runs deeper than simply thinking a major will be enjoyable. Without actual experience in the duties and tasks that pertain to vocational positions available to graduates in a chosen field, students cannot be expected to know whether they will truly enjoy or find satisfaction in that career track. Arguably, many students who choose a career path and ultimately find that they are satisfied with it do not really *know* from the beginning that it is something they are very interested in, but rather discover and confirm that their choice was one that fit. This is not to say that students

need to make up their mind early and stick to that choice—it is likely that students will change their minds about vocational interests many times throughout secondary school. Unfortunately, our society is one that tends to pressure students into making a decision long before they graduate high school, and it is often a decision they are not prepared to make.

So why is it that high school students are not aware of—or do not fully understand—their own vocational interests? One possible contributing factor could be that only 18% of high school students hold jobs (Child Trends DataBank, 2015). Working and gaining experience is an excellent way to determine whether a job is one an individual would like to turn into a future career. Of course, many jobs available to first-time workers do not align with what students wish to do later in life (e.g., service industry and retail positions). Another consideration is the low number of student participation in internships, which would offer students the opportunity to "test out" their interests before having to make an important decision like college major declaration.

Perhaps another of the largest contributing factors to students' lack of awareness of their vocational interests deals with the availability of career exploration opportunities. Lewallen (1993) reported that the availability of career education varies greatly from school to school in the United States. Such education can occur in any number of forms, but some of the most common forms are job shadowing, participating in summer career exploration camps, taking career interest inventories, and attending the specialized classes often offered in high schools (e.g., woodshop or applied technology). These four examples—and particularly the last two—may require a discussion with a

school guidance counselor, which brings to light yet another issue: the ratio of guidance counselors to students is only one to 450, on average (Ronan, 2005). In some schools, a single guidance counselor may be responsible for as many as 1000 students (Carrell & Carell, 2006), calling into question just how much of a resource school counselors actually are to students in larger districts. Problems surrounding school counseling will be discussed in greater detail in Chapter 2.

Changing Majors

Regardless of the reason for choosing an initial major—perceived interest, parental influence, earning potential, etc.—the fact remains that 80 percent of college students will change their major at least once (NCES, 2014). This may not sound particularly troublesome, and, certainly, for some students it may not be. After all, a college major tends to lead to a career in a related field. With job satisfaction as important as it is, students should be sure that they are in a major they enjoy. The potential for an issue arises we look at the number of times students change majors. Of the 80 percent of students who will change majors at least once, the average number of major changes is three (NCES, 2014).

Major changing and negative student outcomes. With the national average of major changes at three, that means some students will end up changing their major well over three times. It takes little effort to surmise possible negative outcomes of changing majors even just two or three times, let alone four or five times, especially when the timing of major those changes is considered. Some of the possible areas affected by frequent major changing are time to degree, cost of education, and student stress.

Time to degree. Complete College America reported in 2014 that it takes undergraduate students an average of six years to complete a four-year degree. The percentage of students graduating on time is only 36% for flagship and research universities and only 19% for non-flagship universities. It is unclear how much of those percentages are due to major changing, though findings of one study that surveyed parents whose children had taken eight or more semesters to graduate showed that the majority of parents cited major changing as the top reason for the delay (Sanford & Rivera, 1994).

There is also little known about the timing of major changing—that is, when over the course of study students are most likely to change majors. If it takes some students two or more years to decide to make the change, they may have already accumulated initial major-specific credits that do not count toward to the new major degree plan. Thus, their time-to-degree is prolonged.

Cost of education. As the old adage goes, time is money. Each semester a student is enrolled in college means more tuition. Seventy-percent of students leave college with around $30,000 worth of debt (TICAS, 2015). Complete College America calculated in their 2014 report that each additional year tacked on to the end of a 4-year bachelor's degree costs students an average of $22,826 in tuition and $45,327 in lost wages. Time and money are clearly very tightly intertwined in the college experience.

Student stress. The third salient factor of stress likely envelops the issues of time and money. Approximately 75% of college students report that they are moderately stressed and 12% report that they are highly stressed (Pierceall & Kim, 2007). It is

unclear how much major changing specifically adds to the stress of college students, but considering that 80% of students change majors at least once it is not unreasonable to suggest that it plays at least some role. For most students college marks the first time they live and take care of themselves independently. It is the first time they get a job, where they make (or do not make) new friends, and it is where they really begin to figure out their own identity. Overall, it is a pivotal time when a young adult is experiencing a plethora of new things and making a number of decisions they have never before had to make. Making the decision to change majors multiple times is perhaps an additional burden that many students would rather not have to worry about.

Why students change majors. A number of studies have shown that a significant factor in making to decision to switch from the initially declared major is a students' dislike for (or lack of interest in) their major-specific classes (e.g., Drysdale, Frost, McBeath, 2015; Woosley & Jackson, 2002). Considering that interest is the most often cited reason for choosing the major in the first place, it seems contradictory that lack of interest would be one of the most often cited reasons for switching to a different one. However, if students are not actually aware of what their true interests are, and if the resources that should be available to them during high school in order to figure that out are not actually available, then the "lack of interest" reason begins to make sense.

Purpose Statement

By thoroughly sifting through the literature one will find that research on the general topic of major persistence was most popular between the 1960s and 1980s. Today, most of the focus has shifted to STEM major persistence, particularly in regards

to female and minority students. While we know quite a bit about what factors students say influence their choice of major and what influences them to change majors, very little research has explored "reasons for their reasons," or the background events that lead students to be so unaware of their true interests as they relate to college major and vocational choice. One background area that has seldom been considered along with major persistence rates is that of high school counseling (with particular emphasis on career counseling and college preparation). Given the troublesome student-to-counselor ratio, this is one unexplored area that deserves attention. Furthermore, an arguably equal dearth of research exists that explores the potential negative effects of frequent major changing. Resulting job satisfaction, which is perhaps a positive outcome of major changing, is undeniably important for the general mental and emotional well-being of working adults. The import of job satisfaction as insinuated by its presence in the literature seems to overshadow the import of potential negative effects on student mental and emotional well-being while in college.

With these absences in the literature as they relate to the general student population, one begins to wonder what they might mean for the gifted student population. There is no shortage of claims from gifted education researchers that highly intellectual students are vastly underrepresented when it comes to needed and appropriate school and future counseling. The burden of their multipotential nature among other characteristics they espouse make them especially susceptible to the stressors that accompany college-related decisions. For this reason, there is a need for exploratory research on gifted student perceptions of postsecondary guidance counseling

as it relates to major persistence and the potential negative perceived effects of frequent major switching. The widely held belief that gifted students require less guidance in preparing for their futures needs to be deserted, but we also need to have an understanding of what different (or similar) issues gifted students face in making vocational decisions in order to better aid them in the process.

Research Questions

The topics of career planning, college major persistence patterns, and reasons for changing majors will be addressed through the research questions below.

1. Do major changing trends (i.e., (a) number of major changes, (b) timing of major changing, and (c) reasons for changing) differ for the gifted student population and non-gifted student population?
2. Is there a difference in stress perceived surrounding (a) major changing and/or (b) the overall college experience between gifted and non-gifted students?
3. To what extent do students (a) perceive additional cost of education and time to degree as outcomes related to major changing, and (b) is there a difference in these perceptions depending on the number of times they change majors?
4. (a) Do gifted students report more or less satisfaction with and perceived helpfulness of postsecondary guidance counseling while in high school than non-gifted students? (b) Among gifted students, does the types of counselor they received postsecondary counseling from affect how satisfied with

and/or helpful they find such counseling?

5. Can (a) satisfaction with postsecondary guidance counseling predict perceived stress surrounding major changing and (b) is there a difference between gifted and non-gifted students?
6. Does (a) participation in postsecondary guidance counseling affect the number of times students change majors and (b) is there a difference between gifted and non-gifted students?
7. Does (a) the frequency of meeting with counselors regarding postsecondary guidance predict the number of times students change majors in college and (b) is there a difference between gifted and non-gifted students?
8. Can satisfaction with postsecondary guidance counseling, number of times changing majors, and the number of semesters enrolled before changing majors explain the general stress perceived by college students?

CHAPTER II

LITERATURE REVIEW

The Current State of School Counseling

Guidance counseling in schools is "an inseparable and essential component of students' educational experiences" (Gallant & Zhao, 2011, p. 87). There exists a national organization, the American School Counselor Association (ASCA), devoted to the professional development and ethical practices of counselors across all levels of school settings (ASCA, 2017). High school guidance counseling covers many areas, some of which include new student orientation, academic scheduling, assessment, conflict resolution, and, as is the focus of this dissertation, college preparation and career planning (hereafter referred to as postsecondary guidance counseling). Therefore, high school guidance counselors are expected to be experienced—and perhaps even proactive—in implementing counsel in all of these areas, particularly if their school ascribes to the comprehensive school counseling model, which the ASCA began promoting in 2003. Comprehensive school counseling programs emphasize "…what all students, from pre-kindergarten through 12th grade, should know, understand and be able to do in…three domain areas: academic, career, and personal/social" (ASCA, 2003, p.13). In fact, comprehensive models have become the blueprint for counseling program guidelines in the majority of states (Dahir, Burnham, & Stone, 2009).

What is unclear is just how prepared counselors are to undertake all forms of counseling as needs arise in the students for which they are responsible. The consensus

is that more research is needed in order to be able to make sophisticated claims about the preparedness of counselors and effectiveness of counseling (Dimmitt, Carey, McGannon, & Henningson, 2005; Whiston, 2002). However, Dahir, Burnham, and Stone (2009) conducted a review of school counselor associations and departments of education that found that there was "little or no targeted professional development to support the implementation process of the ASCA National model" (p. 188). Results from the Dahir et al. study reverberate this sentiment—in a sample of over 1,200 counselors they found that those who counseled in a high school setting had priorities more aligned with traditional models of counseling than with the ASCA model. Traditional models typically do not include the areas of college and career counseling.

The National Association for College Admissions Counseling published a report in 2015 that included results from a survey administered to high school counselors across the country. The report covers the 2013-2014 school year. Some of the most pertinent findings are as follows:

- Seventy-three percent of private schools employed at least one counselor whose only job was to provide students with college counseling whereas only 30% of public schools employed such a counselor.
- Private school counselors ranked postsecondary advising as their number one priority whereas public school counselors ranked their top priority as current-level academic guidance.
- Private school counselors spent 55% of their time on college counseling as opposed to 22% of time spent by public school counselors.

- In total, 37% of high schools reported that their counselors are required to participate in professional development opportunities. Fifty-four percent of private schools required this and 32% of public schools required it. In addition, 70% of private schools requiring this of their counselors covered the costs entirely as opposed to only 33% of the public schools requiring it.

Clearly, these statistics bring to light yet another consideration in terms of high school counseling: characteristics of private schools versus public schools. During the 2013-2014 school year, the United States saw the lowest enrollment in private schools since before 1995 with just 10% of students enrolled. It is projected that enrollment in private schools will continue to decline. We can see from these statistics that a great majority of students attend schools that either do not have counselors trained in college planning or the counselors spend only a minimal amount of time counseling students in college planning.

Though there is certainly plenty of research revolving around the topic of school counseling, there is a general need for empirical research that looks into the effect of counseling on student outcomes (Quinby, 2011; Whiston, 2002). Furthermore, while a number of reviews have been conducted that focus solely on elementary and middle school levels (e.g., Gerler, 1985, and St. Clair, 1989), few consider the high school level, and none at all focus *solely* on high school students.

Counseling of the Gifted

Just as with counseling of other students, counseling of gifted students is a popular, albeit controversial, topic in gifted education. Because of the erroneous belief

that gifted students do not require the same kind of guidance as their peers, the effect is that their counseling needs (whether academic or otherwise) go unmet. This happens not just at the school level, where perhaps individual counselors hold this belief, but it seems to be an error in thought even at the state and/or federal level as there have been no effective calls to action or policy changes regarding the counseling of the gifted.

For over 40 years published papers have been making the same statements regarding school counselors not having the adequate training, knowledge, or attitudes to effectively provide services to gifted students (e.g., Elijah, 2011; Fox, & Richmond, 1979; Moon, Kelly, & Feldhusen, 1997; Peterson, 2006). Even more troubling is that some school districts do not offer counselors training over the initial step of gifted counseling—identification. If counselors are unable to identify gifted students to provide them with appropriate interventions, then gifted students are at a severe disadvantage (Slaten, Scalise, Gutten, & Baskin, 2013). Test (2015) surveyed school counselors from urban districts across the state of Texas, 28% of which reported they had not received formal training on the nature and needs of gifted students. Forty-one percent reported that they felt unprepared to establish interventions for the gifted.

Student Perception of Counseling

Aside from reports like that from NACAC, we have relatively little information in regards to high school counseling and its effects, especially when we drill down to college planning and career considerations. Student perception of counseling services is one area in which valuable information regarding the state of counseling can potentially be found. Unfortunately, the student perspective is another area that is rarely reported

(Gibbons, Borders, Wiles, Stephan, & Davis, 2006). In fact, only two studies to date have been published that provide a snapshot of student perception of postsecondary guidance counseling in high school.

The largest study exploring student perception of school counseling services (in general) was conducted by Gallant and Zhao (2011). Just over 700 students in grades 9 through 12 were surveyed regarding their awareness of counseling services in their schools, their use of those services, and satisfaction with those services. In general, overall awareness of the existence of school counseling services was very high. Awareness of college preparation services and career services was 85% and 52%, respectively. In terms of use of those services, 47% reported participating in college preparation counseling and just under 25% reported participating in career-related counseling. Thus, just under half of students who are aware of those services ended up using them. Interestingly, of all the counseling services offered, satisfaction was highest with college preparation (80% in comparison to 68% for career services). It is noteworthy, however, that the sample used in this study is not representative of the entire population of U.S. students as it was conducted in an urban district in the southeast where—though 82% of the sample indicated working toward a degree that would prepare them for college—71% were African American students. However, with such a high percentage of students indicating plans to attend a 2- or 4-year college—and given the percentage of students who actually used those services—finding ways to promote the utilization of those services is perhaps something schools should begin to consider.

A second study conducted by Gibbons, Borders, Wiles, Stephan, and Davis

(2006) focused solely on career and college planning. However, in this case only ninth graders were surveyed, so the snapshot provided is incomplete; 10th, 11th, and 12th graders may be more likely to seek out school counseling services, particularly as they apply to college and career planning. A survey created to address career development and counseling experience was administered to 222 students. Eighty-five percent of students indicated plans to attend either a 4-year institution or community college after graduation. Ninety-seven percent indicated a career of interest, but the top cited ways they learned about those careers were from television (27%) and parents (26.2%) with school counselors appearing at the bottom of the list (3.2%). A wide variety of methods to prepare plans after graduation were more popular than speaking with a counselor (29.7%), of which students rated as 2.08 on a scale of 0 (not at all helpful) to 4 (very helpful). Just 6% reported that school counselors were the *most* helpful in planning for the future. Students also generally underestimated the usefulness of school counselors to be helpful, with 14% of students reporting their belief that talking with a counselor would be the least helpful task regarding choosing a career. Other options included exposure to different careers, information on different careers, taking interest inventories, talking with parents/friends, learning how to find a job, help with deciding on a career, and resume writing. It is unclear, though, whether that 14% of students is part of the same percentage that used counseling services, or if they never used those services and thus have no basis for their response, or if it is a mixture of both of these groups.

What makes it particularly difficult to generalize findings like those in the

aforementioned studies to schools across the U.S. is that they are derived from one location (i.e., one school or one district) where the characteristics of such counseling programs are unchanging and students who have utilized the services are likely to have similar experiences.

Gifted student perception of school counseling. Where there is so little information on the perceptions students in the general student population have of counseling services, there is even less known about the perception gifted students have about these services. In fact, there has never been a study conducted that takes into account school counseling perceptions of gifted students. This is alarming considering how long the underrepresentation of the gifted has been a topic of issue amongst educators, researchers, and parents of gifted children. In any instance of trying to learn more about a group that is continually and systematically disadvantaged in some way, it makes the most sense to collect information from members of that group directly. Unfortunately, education can tend to be heavy-laden with bureaucracy and it may not have even occurred to those that *can* affect change that the voice of the gifted student is of great worth, and perhaps integral, to begin addressing the issue of counseling needs of the gifted.

Major Persistence (Or Lack Thereof)

The National Center of Education Statistics reported in 2014 that approximately 80% of college students change their major over the course of their postsecondary education. For students who decide to change majors, the average number of major changes is three. Considering the nature of average estimates, this means that some

students change majors as many as four, five, or six or more times while in college. As detailed in Chapter 1 there a number of negative outcomes students can potentially experience from frequent major changing, but the vast majority of the research on major persistence and major changing has placed the emphasis on the importance of positive college experiences and person-environment fit.

Factors Affecting Major Persistence and Changing

Students offer many different reasons for their decision to change majors. The most commonly cited reason for major changing, regardless of initial major, is lack of interest (Beggs, Bantham, & Taylor, 2008; Drysdale, Frost, & McBeath, 2015; Liao & Ji, 2015; Malgwi, Howe, & Burnaby, 2005). Other popular reasons for changing majors are family and peer influence (Beggs, Bantham, & Taylor, 2008), expected earning potential (Montmarquette, Cannings, & Mahseredjian, 2002), and potential for career advancement (Malgwi, Howe, & Burnaby, 2005).

Asking students directly what their reasons are for changing majors is unquestionably informative. Nevertheless, if one of the goals of learning more about major changing patterns is to minimize the occurrence of major changing—assuming students are initially choosing a suitable major—it is important to explore what factors predict major changing and persistence. The extant literature provides a grab bag of predictors, among which are personality factors and person-major fit (Adamek & Goudy, 1966; Barak & Rabbi, 1982; Smart, Feldman, & Etherington, 2000), academic performance (Ackerman, Kanfer, & Calderwood, 2013; Allen & Robbins, 2008; Ost, 2010), self-concept (Adamak, 1966; Warren, 1961), self-efficacy (Elias & Loomis,

2000), peer quality (Ost, 2010), and use of academic resources (Elliott & Elliot, 1985). College planning and counseling while in high school is not represented.

Some researchers have tested major-specific interventions to determine possible effects on persistence. For example, Lifton, Cohen, and Schlesinger (2008) studied a linkage in the curricula of a first-year business course with a first-year seminar for business students. They found not only that students who participated in the linked seminar performed better on their first-year Introduction to Business exam, but that 61% of those who participated persisted in the business major until graduation as compared to 45% of business majors who did not participate.

Subjects of Major Persistence Research

Most of the existing literature on the topic of major persistence is focused on subgroups of the postsecondary population. Mostly, the recent focus is on major persistence of students who begin their postsecondary education in STEM majors (e.g., Bahi, Higgins, & Staley, 2015; King, 2015; Mau, 2016; Shaw & Barbuti, 2010). Another commonly researched area in major persistence takes a step further to address female students' persistence (e.g., Gayles & Ampaw, 2016; George-Jackson, 2014; Shapiro & Sax, 2011) and persistence of female students of color (e.g., Ceglie & Settlage, 2016) in STEM majors. However, some of these studies did include samples of students from a wide range of major areas, and in some cases briefly presented and interpreted that data.

STEM is a popular focus considering the importance placed on preparing students to enter the workforce in positions that that allow them to contribute their ideas

and skills to the betterment of the U.S. economy. The President's Council of Advisors on Science and Technology (PCAST) released a report in 2012 emphasizing the need for a competitive U.S. workforce by way of a largely STEM-educated population (PCAST, 2012). Previous reports from the PCAST have detailed how the desired level of competitiveness is not being met for a variety of reasons, one of the foremost being that students are entering their postsecondary institutions generally unprepared for the rigor of STEM curricula (PCAST, 2010). The reports also address the concern of the disproportionately low number of females represented in STEM fields. Thus, it is clear why the major persistence tends to focus on these topics. A few of the aforementioned studies that include findings on students across all major areas are presented here.

Shaw and Barbuti (2010) published a study in which the focus was on STEM students, but their sample included students who also intended to declare non-STEM majors. They examined 28,390 students from 67 postsecondary institutions across the United States (about 11% of which were classified as STEM students). Considering the breakdown of "switchers" and "persisters" by ethnicity, they found that a higher percentage in each ethnic category switched as opposed to persisted, with American Indian/Alaskan Natives having the highest percentage of switchers at 69%. Females were more likely to have switched majors than males, at 62% and 57%, respectively. Results were also broken down by parental income level and first-generation status. The highest percentage of switchers fell in the $35,000-$70,000 income level group (60%) and the first-generation student group (62%). Regardless of the category students fell in, the percentage of major switchers was higher than that of persisters.

Shaw and Barbuti also reported the number of switchers and persisters based on the major students reported they intended to declare (while still in high school). What they found was that out of 19 major areas, the highest switcher rates were from Public Administration and Social Services (90%), Philosophy, Religion, & Theology (81%), and Mathematics and Statistics (79%). The lowest switcher rates were from Engineering and Technology (39%); Business, Management, and Marketing (50%); and Visual and Performing Arts (54%). Indeed, Shaw and Barbuti found that students who intended to declare STEM majors were actually less likely to switch majors than non-STEM students. However, these findings cannot necessarily be generalized to the larger population of major switchers because, from this data, it is impossible to know whether students who indicated an intended major while in high school actually ended up declaring that major. Furthermore, nothing is known about the number of times students in this sample switched majors—declared college major data was based on the major students were in at the beginning of their third year of college. Lastly, due to the low number of students ($n < 100$) indicating intent to major in some areas, 14 major areas were left out of the analyses.

Addressing some of the limitations of Shaw and Barbuti's study, King (2015) compared rates of major persistence between students who had actually declared their majors at the beginning of the first year college and then went on to either earn a degree in that initial major or in a different major. Using national data to compare over 12,000 students who had declared physical science/engineering (PS/E) majors to those who had declared majors in business, life sciences, and social sciences, King found that 57% of

PS/E majors persisted, which the highest rate of persistence in Education and Business (81% and 80%, respectively), and the lowest in Social Science (41%).

Though interesting and rather telling, what is unfortunate about the research focus on STEM majors is that, though these studies address an issue of economic importance, the issues surrounding major persistence patterns of the student population as a whole are minimized to focus on only these subsets of the population. Comparisons to the general student population and students in other majors are made, but the result is that far less is known about students from a wide selection of other major fields. Furthermore, no recent literature connects rates of major persistence to student perceptions of postsecondary guidance counseling while in high school.

Gifted Major Persistence

With the focus of major persistence on subgroups of the collegiate student population, the gifted student sub-group finds itself underrepresented in yet another area of educational research. With so little published in the narrow arena of gifted major persistence, perhaps it makes the most sense to sift through the literature chronologically. Major switching rates have always been significant, regardless of subgroup membership. In the late 1950s it was estimated that half of all college students would change their major at least once (Iffert, 1956).

One of the first empirical studies to focus on major persistence as it relates to vocational choice in the gifted student population found that the rates of major changing among 508 Merit Scholars was only 32% for males and 39% for females (Forrest, 1961). Interestingly, these major changing rates are relatively low compared to modern

estimates of the general student population.

A much more widely cited study published just three years later is perhaps the seminal work on gifted major persistence. Holland and Nichols (1964) tested the hypothesis that high aptitude students would stay in a given major field if they fit the description of the "typical student" in that major field (e.g., aptitudes, achievement, and personality as measured by a variety of personality scales). Again, National Merit Finalists were chosen to represent high aptitude students. Initial major preferences (as indicated during their high school senior year) were compared to enrolled major field at the end of the college freshman year. They found that, generally, their hypothesis regarding personality traits was validated—for example, male students who stayed in Realistic fields like engineering were "responsible, non-original, intolerant of ambiguity, and had a simple rather than a complex outlook" (p. 238). They also found that in most cases students who left their initial major preference had expressed less interest in those fields than their counterparts who decided to stay with that major field. Holland and Nichols also asked students for their own explanations for changing or not changing their major. Overwhelmingly, regardless of whether they changed, students cited interest or lack of interest in course content as the first reason. Lacking aptitude was also an indicator of change.

Though interesting and insightful, both of these studies have their shortcomings. First, and most obviously, these studies were conducted in the 1960s. The state of education has changed tremendously, and arguably more so has the state of gender roles in education. A greater percentage of females in these studies were stating initial

preference for careers that Holland would categorize as Conventional (i.e., secretarial, library science, home economics, etc.) as compared to the preferences of females today. Furthermore, the samples themselves are troublesome. Both studies included a disproportionately higher percentage of males. Though they often considered the genders separately, a main concern is that of the typical characteristics of National Merit Scholars. Historically, these students are from high socioeconomic backgrounds, and thus not representative of all gifted students. Last, and as mentioned as a limitation of a previously discussed study, all too often these studies depend only on a statement of "preferred major" as a starting point rather than an actual declared major. Thus, very little can actually be said about whether these results apply to major persistence at all.

Though few in number, in more recent years there have been studies built off of the work of Holland and Nichols (1964) to further explore identity and vocational congruence of gifted students by way of college major persistence and major interest (e.g., Elias & Loomis, 2000; Leung, 1998). Like studies of major persistence in the general student population, there has also been an interest in persistence in science-related majors of high-ability students, mostly for the same reasons it is a topic of interest in the larger population (e.g., Grandy, 1998), and subgroups of the gifted student population such as females (e.g., Grant, Battle, & Heggoy, 2000). However, there is an absence of recent research on gifted major persistence overall, and that is what this dissertation aims to address in part.

CHAPTER III

METHOD

Design

The research questions posed in this dissertation were addressed in the development and dissemination of an online survey. A pilot study was conducted prior to the full-scale administration of the survey. There are many reasons to conduct pilot studies, particularly when it comes to survey research. As Teijlingen and Hundley (2001) suggest, some of these include (1) assessing the feasibility of a full-scale survey, (2) assessing whether the research protocol is realistic and workable, (3) identifying logistical problems which might occur using the proposed methods, (4) collecting preliminary data, and (5) training a researcher in as many elements of the research process as possible. The main purpose of piloting the current survey instrument was to test how the instrument functioned for the target population and to gain feedback from participants on the instrument itself (e.g., issues of clarity, perceptions of survey flow, and feasibility).

Participants

The participants in this study were students at a large university in the southern United States enrolled during the Spring 2017 semester. All students over the age of 18, freshmen to graduate-level, were invited to participate in completing the online survey. The decision was made to exclude graduate students who completed their undergraduate degree over ten years ago. The survey included items that required participants to recall,

for example, the number of semesters between major changes and types of gifted programming they participated in during early years of schooling. Thus, a cap of ten years was chosen between a completed undergraduate degree and time at which the survey was taken to mitigate the number of inaccurate responses due to misremembering.

Pilot Survey

Participants for the pilot study were recruited from six university classes. Two were face-to-face classes (both undergraduate-level) and four were online (three undergraduate-level and one graduate-level). The total number of students in the six classes was 158, of which 68 took the survey. Of the 16 graduate students who took the survey, five indicated that it had been over ten years since obtaining their undergraduate degree. Thus, the final sample in the pilot study consisted of 63 participants, a final response rate of 39.9%. Because feedback from students elicited the need for some changes to be made to the instrument (see Instruments), none of the responses from the pilot study were used in the final analyses.

Full-Scale Survey

The population of interest for the final version of the survey consisted of the entire student population at the university—around 60,000 students—excluding graduate students who completed their undergraduate degrees over ten years ago. One thousand fifty-two students consented and completed the survey, of which 225 were graduate students. Five graduate students reported finishing their undergraduate degree over ten years ago, thus the final sample of the study was 1,047. There were a number of partial

responses (n=33) that were not included in the final analyses. Table 1 shows the demographic characteristics of the final sample.

Table 1

Demographics of Study Sample by Gifted Status

	Total sample	Gifted	Non-gifted
Gender			
% Female	69.4	70.2	68.0
% Male	30.6	29.8	32.0
Race			
% White	61.8	64.3	57.3
% Hispanic	16.2	16.4	16
% Asian	15.6	11.9	22.1
% African American	3.7	4.5	2.4
% Native Hawaiian/Pac. Islander	0.3	.03	.03
% American Indian/Alaska Native	0.3	.04	--
Class Level			
% Freshmen	15.7	17.6	12.3
% Sophomore	21.5	23.4	18.1
% Junior	24.5	24.0	25.3
% Senior	17.4	17.1	17.9
% Graduate	21.0	18.0	26.4
Gifted %	64.2	--	--

Note. Total n for each variable is 1,047

Instrumentation

Pilot Survey

The survey for this study was developed using Qualtrics, a popular platform for

creating and conducting online surveys. The version of the survey made available to pilot study participants included 57 possible items. Functionality in Qualtrics allows certain items to be displayed based on a participant's previous responses—called "display logic". This function ensures that participants who indicate certain responses on particular items do not see future items that are unrelated to what they indicated in their response. Alternatively, display logic can also ensure that participants *do* see future items that relate to what they indicated in a response. Forty-five of the possible 56 items were tied to display logic, meaning that it was possible only 12 items were displayed to a particular participant (e.g., a participant who reported not (1) not being identified as gifted, (2) not having had postsecondary guidance counseling while in school, and (3) not having ever changed majors).

The survey items fell into one of six categories: demographic and background information, gifted identification, postsecondary guidance counseling while in high school, college entry, major changing, and reflection/stress items. Because the major goal of the pilot study was to obtain feedback on the survey instrument there was an item included at the end of the survey that asked participants to report on any aspect of the survey that was confusing/unclear, redundant, or if there were any technical errors (such as with display logic).

Full-Scale Survey

Revisions. The pilot survey was successful in eliciting responses from students regarding the survey's feasibility and clarity. A total of 11 revisions were made to the survey before sending it to all university students. Most revisions were made to response

options. For example, response options of some items were in the format of a populated drop-down menu (e.g., first declared major), but some participants reported that intended response was not present in the menu of options. In these cases, open-ended text entry boxes replaced populated drop-down menus. Response options were added to other items, such as the inclusion of an "Other" option with the ability to write in a response. Minor re-wording revisions were made two a small number of items. Last, 12 items were added, ten of which comprise the Perceived Stress Scale (1983), an instrument widely used to assess stress levels of young adults.

Perceived Stress Scale (PSS). The PSS was included as a way to compare the self-reported stress levels of students to a more objective measure of their stress levels during their undergraduate education. It consists of ten items that require test-takers to report how often they have felt what is described in a specified time period. The items are answered on a five-point Likert scale (*Never, Almost never, Sometimes, Fairly often, All the time).* The original scale includes items phrased in a way that asks test-takers to report how often they have felt a certain way within the last month, but it was modified for this study to ask participants to report how often they have felt what is being described over the course of their undergraduate education.

Scoring for the PSS is simple—test-takers receive zero points for a *Never* response, one point for an *Almost never* response, two points for a *Sometimes* response, and so on. Four items on the scale are reverse-scored due to their positive wording. Scores on each item are then summed across items. Scores ranging from zero to 13 are considered low perceived stress, 14 to 26 is moderate perceived stress, and 27 to 40 is

high perceived stress. In the normative sample for the PSS, Cronbach's α estimates were between .84 and .86, test-retest reliability was .85, and correlation to other measures of similar symptoms ranged from .52 to .76 (Cohen, Kamarck, & Mermelstein, 1983). The Perceived Stress Scale in the current sample was found to be highly reliable with an estimate matching that of the norming sample (α = .85).

Final version. After all revisions were completed and accepted by the university's Institutional Review Board, the final survey instrument included 65 possible items/questions, of which 44 were tied to display logic. The survey items fell into the same six categories as those in the pilot study, with the addition of the Perceived Stress Scale items at the end of the instrument. See Appendix A for a full list of survey items.

Procedures

Recruitment

Pilot study. Pilot study participants came from a convenience sample of six university courses. Of the six courses, four were online and two were face-to-face. I physically attended the two face-to-face courses to briefly introduce the purpose of the study at the start of class and inform those that chose to participate that their feedback on the survey was desired at the end of the survey. During the time researcher explained the purpose of the study, the course instructor sent the IRB-approved recruitment email to each student enrolled in the course. After the introduction, the instructor gave students time to take the survey in class.

Full-scale study. Participants for the full-scale study were recruited in two ways. First, the survey link was embedded in an email that was sent using the university's

Bulkmail delivery system to all enrolled students. This email included all the same information as the email used for recruitment in the pilot study. Second—because the gifted population is very small and there was concern about receiving enough responses from those who were identified as intellectually gifted—a recruitment appeal was made to the university's Honors program in an attempt to achieve a sample size large enough to ensure statistical power. Though, of course, it is not required that students be identified as gifted in order to participate in the Honors program, it is conceivable that such a group houses a higher proportion of gifted individuals than exists in the general student population. It was my belief that having a recruitment email sent to this group of students by someone within the Honors program would result in a higher response rate of those identified as intellectually gifted. Thus, a separate recruitment email was sent to the director of the university's Honors program who in turn forwarded the email to all enrolled Honors students—approximately 800 students.

Recruitment email. The emails sent to all three groups (pilot, full-scale, Honors) included the following information: (1) a brief introduction to the study, (2) participant eligibility, (3) what participation entails, and (4) participant compensation. If students chose to provide their email address in the survey when prompted, they were entered to win one of six $30 Amazon gift cards.

Consent information. Due to the online nature of participation, it was impossible to obtain written consent from those who chose to participate. Instead, consent was built directly into the survey itself. Upon clicking on the survey link in the email students were directed to the first page of the survey, which included detailed

information regarding the purpose of the study, their rights as participants, compensation, potential risk, confidentiality, privacy, and who to contact should they feel the need. At the bottom of that page was a statement letting students know that by indicating "Yes" they were providing their consent to participant and would then be allowed to proceed to take the survey. Those who indicated "No" were not advanced to the survey.

Data Analysis

Gifted Self-Indication

In this study, participants are asked to indicate whether they were identified as intellectually gifted at any point from Pre-K to 12th grade. Self-report methods like surveys and questionnaires sometimes result in the reporting of false information due to factors like social desirability. Though it is impossible to determine with certainty whether any given response is true or false, follow-up questions were included in this survey to help in distinguishing between gifted and non-gifted (or, perhaps, between gifted and high-achieving) in the case of possible false/dishonest responses.

Participants who indicated they were at some point identified as intellectually gifted were subsequently prompted to indicate which method(s) were used in their own identification process. Their list of options included grades/classroom performance, standardized achievement tests, IQ/aptitude tests, teacher nomination, parent nomination, self-nomination, other, and unknown/do not remember. Participants could choose any number of options that applied to them.

I ran some basic statistics on a subset of the gifted sample and compare those

statistics to the entirety of the self-indicated gifted sample in order to get a better idea of whether the whole sample of gifted students was appropriate to use in the main analyses. Though impossible to know whether those who indicated achievement tests and/or IQ/aptitude tests were used in their identification were actually identified as gifted, it was decided that those who indicated at least one of these two options were marked as gifted and included in the smaller sample of gifted students to be compared to the larger sample. Point estimates were remarkably similar (and in some cases the same), and thus it was decided to keep all participants who originally indicated they were identified as gifted in the original gifted subsample.

Separate Analyses

Research question 1 is concerned with differences in major changing "trends" between the gifted student population and the general student population. There are three different trends of interest: (a) average number of major changes, (b) timing of major changing, and (c) top cited reasons for changing majors. To get the most accurate picture of the major changing trends (research questions 1a and 1b) of gifted and non-gifted students and how those trends differ between those groups, only data from upperclassmen (juniors and seniors) and graduate students were included in these analyses. The inclusion of freshmen and sophomore data could potentially muddy the results due to the likelihood that many of them have either not changed their major yet but will, or they have already done so but will change their major again. Certainly, some juniors (and perhaps even seniors) will change their major again, but this is far less likely.

Research questions 1a and 1b were investigated using independent samples *t*-tests. Research question 1c was investigated qualitatively. All student responses, including underclassmen responses, were considered. The most frequently cited reasons for changing majors was noted for each group (research question 1c).

Both research questions 2a and 2b—difference in perceived stress related to major changing and the undergraduate education in its entirety—were investigated using independent samples *t*-tests. Scores on the PSS were compared to students' self-reported stress during their undergraduate education.

Research question 3a regarding perceptions of additional cost and time to degree as consequences of major changing was investigated by way of descriptive statistics. Both gifted and non-gifted participants were analyzed together. In a subsequent analysis (research question 3b), freshmen, sophomores, and juniors were filtered out. The resulting sample—seniors and graduate students—was then divided into participants who have changed majors once and those who have changed more than once. Two independent samples *t*-tests (one for increased cost of education and one for increased time to degree) were conducted to determine whether the number of major changes influences perception of these consequences.

A final set of independent samples *t*-tests was used to investigate research question 4. After controlling for gifted students who received counseling from gifted-specific program faculty and/or advisors, the gifted and non-gifted groups were compared to examine mean differences in the satisfaction with and perceived helpfulness of high school postsecondary guidance counseling. Finally, gifted students who had

received counseling from gifted faculty/counselors were compared to gifted students whose counseling came from regular school counselors exclusively in terms of satisfaction with and perceived helpfulness of counseling.

Research questions 5-7 were addressed using regression methods. Each of the three regression equations followed the same format, shown here as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 + \varepsilon$$

where β_3 is the coefficient of the interaction term of the explanatory variable and gifted status so as to be able to compare the effect between both gifted and non-gifted groups. Research question 5 in particular was investigated using ordinal logistic regression as the outcome variable—perceived stress due to major changing—was measured on a five-point Likert scale ranging from *strongly disagree t*o *strongly agree.* The explanatory variable of satisfaction with postsecondary guidance counseling, though also measured using an ordinal five-point Likert scale, was ultimately treated as continuous. A Wald test showed that the effects of the categorical variable were not statistically significant and thus the continuous version alone was sufficient.

Number of major changes is the dependent variable in both regression models for research questions 6 and 7. The main explanatory variables in each analysis—participation in postsecondary guidance counseling in question 6 and frequency of participation in question 7—are highly correlated and thus not included in the same analysis. Each regression model was run twice, once including data from upperclassmen regardless of their major changing status and once including just those who changed at least once.

Typically, models with count-type dependent variables like those in research questions 6 and 7 follow a Poisson distribution rather than a normal distribution, rendering linear regression methods inappropriate. However, Poisson regression models (including both zero-inflated and zero-inflated negative binomial models) failed to fit the data. Thus, it was decided to run the analyses using robust linear regression. Linear regression is a fairly robust method to nonnormality in its own right, but employing the robust method is another way to circumvent limitations of normal linear regression and any possible violations that may occur using that method (Sturman, 1999).

Research question 8 was investigated using path analysis. The model used to fit the data can be seen in Figure 1. Again, because number of major changes is an exogenous variable in the model, only upperclassmen and graduate students were included in the analysis.

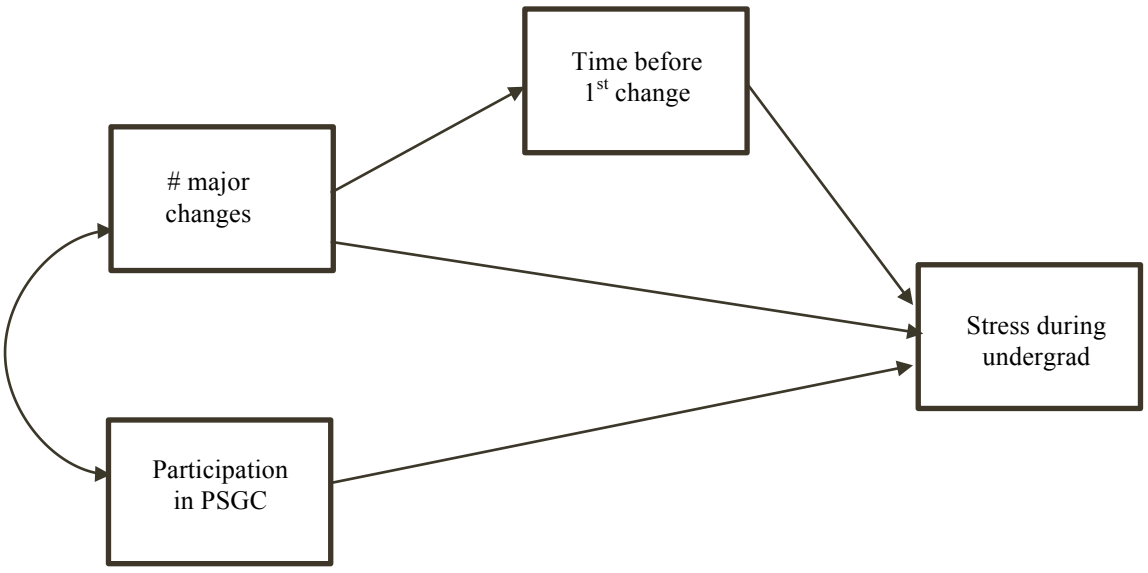

Figure 1. Proposed path model to answer research question 8.

CHAPTER IV

RESULTS

Descriptive Statistics

The survey was composed of four main sections of items used in the separate analyses: (1) gifted status, (2) postsecondary guidance counseling, (3) college entry and major changing, and (4) stress and reflection. Descriptive statistics for some items in each of these sections are displayed in Tables 2-5. Descriptive statistics for some items in those sections are briefly discussed here (e.g., most items in the gifted status section of the survey are categorical, and thus the single continuous item is described below). Correlations between key variables are represented in Table 7.

Gifted Status

The only continuously measured item in this section of the survey—and therefore not represented in Table 2—is years spent in gifted programming. Only the 560 respondents who reported having participated in gifted programming were presented with the item (total of 83.3% of the gifted portion of the sample). Responses ranged from one year to 13 years ($M = 6.55$, $SD = 3.42$).

Postsecondary Guidance Counseling

In total, 53.1% of the gifted sub-sample indicated that they had received postsecondary guidance counseling compared to 44.3% of the non-gifted sub-sample. Of the 523 students who indicated they had received some form of postsecondary guidance counseling, 42.3% reported that they sought that guidance themselves, 43.4% reported

Table 2

Correlations of Key Variables

Measure	1	2	3	4	5	6	7	8	9	10
1. Frequency of PSGC	—									
2. Satisfied with PSGC	.396**	—								
3. PSGC was helpful	.416**	.759**	—							
4. Times changed major (just changers)	-.109	-.113	-.127	—						
5. Times changed major (all)	.062	.041	.015	.981**	—					
6. Stress due to major changing	-.052	-.064	-.018	.207**	.190**	—				
7. Stress during college	.083	.005	.021	.082	-.025	.242**	—			
8. Cost increased due to major changing	-.087	-.242**	-.151*	.233**	.213**	.396**	.198**	—		
9. Time increased due to major changing	-.042	-.138*	-.037	.256**	.226**	.350**	.224**	.682**	—	
10. PSS Score	.055	-.108*	-.085	-.005	.066**	.216**	.543**	.144**	.152**	—

*$p < .05$. **$p < .01$.

that the counseling was required, and 14.3% reported that their counseling fell into both of these categories.

Of the gifted students who indicated having received postsecondary guidance counseling (n=357), 86.5% reported having received the counseling from a regular school counselor, 3.9% reported having received the counseling from a gifted-specific

Table 3

Gifted Status Descriptive Statistics

	N	% Gifted
Gifted total	672	
When identified		
Pre-School/Pre-K	42	6.3
K-5th grade	489	72.8
6th – 8th grade	95	14.1
9th – 12th grade	46	6.8
Identification process		
Grades/Classroom performance	419	62.4
Std. achievement test(s)	299	44.5
IQ/Aptitude test(s)	297	44.2
Teacher nomination	326	48.5
Parent nomination	57	8.5
Self-nomination	10	1.5
Unknown	86	12.8
Gifted program participation		
Pre-school/Pre-K	17	2.5
K – 5th grade	445	66.2
6th – 8th grade	419	62.4
9th - 12th grade	328	48.8
No participation	101	15.0

teacher/counselor, and 3.2% reported having received the counseling from both types of counselors. Table 3 shows descriptive statistics broken down by students who did and did not report that they received postsecondary guidance counseling.

Table 4

Postsecondary Guidance Counseling (PSGC) Descriptive Statistics

	N (%)	*M*	*SD*
Received PSGC	523 (50.0)		
Frequency of PSGC			
1-2 times	261 (49.4)	--	--
3-4 times	143 (27.3)	--	--
5-6 times	49 (9.4)	--	--
>6 times	69 (13.2)		
I found PSGC helpful[a]	--	3.51	1.15
I am satisfied with the PSGC I received[b]	--	3.38	1.23
Didn't receive PSGC	489 (46.7)		
Wish I had received PSGC[c]	--	2.27	0.72
How much would PSGC have eased college entry[d]	--	2.19	0.76
Don't remember receiving PSGC	35 (0.3)	--	--

[a, b] Scale: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, 5 = Strongly agree
[c, d] Scale: 1 = Not at all, 2 = Somewhat, 3 = Very much

College Entry and Major Changing

Among all respondents (freshmen through graduate level, including those who

did not report ever having changed majors) the average number of major changes was .60 (*SD* = .862). Among just those who reported having changed their major at least once (n=425) the average number of major changes was 1.44 (*SD* = .756). As would perhaps be expected, the average number of major changes increased across class level (M_{Freshman} = 1.14 (.41), $M_{\text{Sophomore}}$ = 1.32 (.571), M_{Junior} = 1.49 (.786), M_{Senior} = 1.50 (.820), M_{Graduate} = 1.54 (.887).

Table 5

College Entry and Major Changing Descriptive Statistics

	N (%)	*M(SD)*
Did not directly enter college	44 (4.2)	--
No. semesters before entry		4[a]
Did not enter with declared major	121 (11.6)	
No. semesters before declaration		2.63 (1.23)
Changed major		
Yes	425 (40.6)	--
No	557 (53.2)	--
No, but considering	65 (6.2)	--
Currently in intended final major[b]		
Yes	741 (89.8)	--
No	43 (5.2)	--
Not Sure	41 (3.9)	--

[a]Median reported as item responses were ordinal (upper-end response option was *>8 semesters*)
[b]Undergraduates only

Timing of major changing was measured ordinally because the upper-end response option was *After my 8th semester*. For each major change participants were asked during (or after) which semester each successive major change was made, not including summer semesters. For students who changed their major at least once (n = 438), most reported having changed their first major between their first and second semesters (59.6%). For students who changed their major at least twice (n = 131), most reported having changed their second major between their second and fourth semesters (78.6%). For students who changed majors at least three times (n = 29), most reported having changed their third major between their third and fifth semesters (72.4%). For students who changed majors at least four times (n = 8), zero reported making their fourth change prior to their fourth semester and one student changed after their eighth semester. Lastly, one student reported having changed their major five times, and their final change was made after their eighth semester.

Stress

Stress and reflection items. All six general stress items are presented in Table 5. Each item utilized a Likert scale for responses.

Perceived Stress Scale (PSS) items. Means and standard deviations of each of the ten PSS items are represented in Table 6. The table shows point estimates for both gifted and non-gifted groups. It is further broken down by underclassmen and upperclassmen (including graduate students).

Though not a specific research question in this study, the difference between the gifted and non-gifted groups were explored on each item using *t*-tests. The only item

resulting in a significant difference between groups was "How often during your undergraduate education have you felt/did you feel nervous or 'stressed'?" Gifted students (M = 4.01, SD = .911) reported significantly more frequent feelings of nervousness and stress during their undergraduate education than non-gifted students (M = 3.89, SD= .926), t (1044) = -2.12, $p < .05$.

Table 6

Stress and Reflection Descriptive Statistics

	N (%)	*M(SD)*
Happy with final major[a]	961 (91.8)	4.28 (1.05)
Stress due to changing major[b]	437 (41.7)	2.67 (1.03)
Stress level during college[b]	1046 (99.9)	3.18 (.739)
Changing majors was a stressor[c]	437 (41.7)	3.45 (1.40)
Cost increased due to changing[c]	437 (41.7)	2.66 (1.46)
Time increased due to changing[c]	427 (41.7)	2.88 (1.54)
With proper PSGC I may not have changed[c]	427 (41.7)	3.03 (1.46)

[a] 5-point Likert scale ranging from Very unhappy to Very happy
[b] 4-point Likert scale ranging from No stress at all to A lot of stress
[c] 5-point Likert scale ranging from Strongly disagree to Strongly agree

t-Tests Results: Research Questions 1-3

Research Question 1

Among upperclassmen participants including those who reported never having changed their undergraduate major, there was no significant difference in the number of

major changes between the gifted sample (M = .70, SD = .876) and the non-gifted sample (M = .75, SD = 1.040), t (656) = -.690, p = .491). A subsequent t-test of just those who reported having changed their major at least once also showed no significant difference using nonparametric estimates, as Levene's test for equality of variances was significant at the p = .05 level (M_{Gifted} = 1.46, SD_{Gifted} = .699, $M_{Non\text{-}Gifted}$ = 1.58, $SD_{Non\text{-}Gifted}$ = .975, t(197.393) = -1.205, p = .230).

Among upperclassmen participants who reported having changed their undergraduate major at least once, there was no significant difference between the gifted sample (M = 2.71, SD = 1.569) and non-gifted sample (M = 2.72, SD = 1.527), t (310) = -.081, p = .935) in the number of semesters participants waited before changing their first major. Also among upperclassmen who reported having changed their major, there was no significant difference in the number of semesters enrolled before switching to their reported final major between the gifted sample (M = 2.95, SD = 1.680) and non-gifted sample (M = 3.22, SD = 1.750), t (407) = -1.532, p = .126).

There is little difference in the top cited reasons between the gifted and non-gifted subsamples. In the gifted sample, the top cited reason for changing majors was interest in the new major or lack of interest in the old major (45.1% of listed reasons reflected this). The second most cited reason was poor performance in the previous major (12.9%), and the third most cited reason was career-related (6.9%). Career-related reasons mainly included lack of fit with career goals in the previous major. The other responses were evenly distributed between a number of other reasons (e.g., travel opportunities, transfer limitations, influence of others, stress, etc.).

Table 7

Perceived Stress Scale (PSS) Descriptive Statistics

	Gifted		Non-Gifted	
	Under	Upper	Under	Upper
Total N	275	397	113	261
Been upset because something happened unexpectedly	3.23 (.88)	3.21 (.87)	3.28 (.87)	3.11 (.81)
Felt unable to control important things in my life	3.21 (1.05)	3.19 (1.00)	3.32 (.96)	3.10 (1.02)
Felt nervous and "stressed"	4.05 (.89)	3.98 (.93)	4.01 (.89)	3.83 (.94)
Felt confident about ability to handle personal problems*	3.66 (.84)	3.74 (.85)	3.53 (.79)	3.74 (.84)
Felt that things were going my way*	3.35 (.807)	3.35 (.77)	3.11 (.70)	3.37 (.81)
Found I could not cope with all the things I had to do	2.90 (1.01)	2.93 (1.05)	2.97 (.97)	2.85 (.96)
Been able to control irritations in my life*	3.24 (.86)	3.47 (.85)	3.36 (.76)	3.43 (.87)
Felt that I was on top of things*	3.24 (.86)	3.40 (.90)	3.27 (.85)	3.36 (.90)
Been angered by things outside of my control	3.23 (1.08)	3.09 (.99)	3.27 (.96)	3.14 (1.02)
Felt difficulties were piling up so high that I could not overcome them	3.02 (1.09)	2.95 (1.09)	2.98 (1.08)	2.87 (1.08)
Overall score	19.97 (6.26)	19.40 (6.17)	20.56 (5.75)	19.01 (6.00)

Note. Asterisk denotes reverse-scored items; "Under" indicates underclassmen, "Upper" indicates upperclassmen; Response scale = Never (0), Almost never (1), Sometimes (2), Fairly often (3), All the time (4)

In the non-gifted sample, students cited interest-related reasons for 44.4% of the changes. The second most frequently cited reason for changing was poor performance in the old major, reported for 13.4% of the major changes. The third most common reason, however, differed between the two groups. In the non-gifted sample participants cited wanting to be in a field where more money could be made as the third most common reason for changing majors (8.8%).

Research Question 2

Results from *t*-tests revealed there was no significant difference in the perceived stress of major changing between the gifted sample ($M = 2.71$, $SD = 1.033$) and the non-gifted sample ($M = 2.59$, $SD = 1.031$), $t\ (435) = 1.150$, $p = .251$. The difference in self-reported stress overall during the undergraduate education between the groups bordered on significance ($M_{Gifted} = 3.22$, $SD_{Gifted} = .734$, $M_{Non\text{-}Gifted} = 3.13$, $SD_{Non\text{-}Gifted} = .746$, $t\ (1044) = 1.835$, $p\ 2 = .067$); however, the difference the average PSS score obtained by each group was less pronounced ($p = .700$).

Research Question 3

Hypothesized components of stress surrounding major changing (i.e., perceived increase in time to degree and perceived increase in cost of undergraduate education) were first looked at using descriptive statistics. As can be seen in Table 5, means for both items fell between the values of 2 and 3 on the five-point Likert scale indicating *somewhat disagree* and *neither agree nor disagree* regarding how much they agree time and cost were increased due to major changing. However, those point estimates include all levels of participants, freshmen through graduate students. When just seniors and

graduate students are considered, the point estimates increase slightly, from 2.66 to 2.74 for cost of education and from 2.88 to 2.96 for time to degree.

Two *t*-tests were conducted—one for cost of education and one for time to degree—to determine if there were any significant differences between the group of students who changed their major only once and those who changed more than once. Again, only seniors and graduate students were included. Results showed that there was a significant difference between groups for both tests. Specifically, participants who reported changing their major only once ($M = 2.52$, $SD = 1.477$) reported less agreement that cost increased due to major changing than participants who reported having changed their major multiple times ($M = 3.20$, $SD = 1.592$), $t\ (171) = -2.796$, $p = .006$). Similarly, participants who reported changing their major only once ($M = 2.57$, $SD = 1.552$) reported less agreement that time to degree increased due to major changing than participants who reported having changed their major multiple times ($M = 3.77$, $SD = 1.566$), $t\ (171) = -4.826$, $p < .001$).

Research Question 4

After controlling for participants who reported having received postsecondary guidance counseling from gifted-specific counselors/faculty while in high school (n = 48), *t*-tests were run to determine whether there was a difference in both satisfaction with postsecondary counseling and perceived helpfulness of that counseling between the gifted and non-gifted groups. Results showed that there was no significant difference between the groups regarding satisfaction with counseling ($M_{Gifted} = 3.34$, $SD_{Gifted} = 1.239$, $M_{Non\text{-}Gifted} = 3.35$, $SD_{Non\text{-}Gifted} = 1.210$, $t\ (473) = -.108$, $p = .914$). Similarly, there

were no significant difference between groups regarding perceived helpfulness of counseling ($M_{Gifted} = 3.44$, $SD_{Gifted} = 1.148$, $M_{Non\text{-}Gifted} = 3.52$, $SD_{Non\text{-}Gifted} = 1.174$, t (473) = -.729, p= .466).

Subsequent *t*-tests were run to determine whether there were significant differences in both satisfaction with postsecondary counseling and perceived helpfulness of that counseling between gifted students who reported having received counseling from gifted counselor/faculty and gifted students who reported counseling from a regular school counselor. Gifted students who reported receiving some or all postsecondary counseling from a gifted counselor/faculty member reported significantly more satisfaction with counseling ($M = 3.77$, $SD = 1.171$) than gifted students who reported receiving all counseling from a regular school counselor ($M = 3.33$, $SD = 1.241$), t (354) = -2.283, $p = .023$. Similarly, gifted students who received counseling from gifted counselors/faculty reported that the counseling was significantly more helpful ($M = 3.94$, $SD = .998$) than those who reported receiving counseling from a regular school counselor ($M = 3.44$, $SD = 1.150$), t (354) = -2.845, $p = .002$.

Regression Results: Research Questions 5-7

Research Question 5

Ordinal regression analysis was used to test if satisfaction with postsecondary guidance counseling significantly predicted perceived stress due to changing majors. Satisfaction with postsecondary counseling was not found to be a significant predictor ($\beta = -.04$ $p = .550$). After adding the dichotomous gifted status variable into the model and including an interaction there was still no significance ($\beta_{SATISFY} = .02$, $p = .819$, $\beta_{GIFTED} =$

.18, p = .389, β_{INT} = -.09, p = .406).

Research Question 6

Robust linear regression was used to test the relationship between participation in postsecondary guidance counseling and the number of major changes participants made. In the model that considered all upperclassmen, including those who reported never having changed their major, participation in postsecondary guidance counseling was not found to be a significant predictor (β = .027, p = .505). With the inclusion of gifted status and the interaction, there was still no significance.

A second model including only upperclassmen who reported having changed their major at least once was subsequently run. The results of the regression indicated that the main effects and interaction explained 2.8% of the variance (R^2 = .028, F (3, 287), p <. 05). It was found that giftedness significantly predicted number of major changes (β = -.224, p < .05), as did the interaction (β = .251, p <. 05). Table 8 lists the results of these two analyses. The marginal means and pairwise comparisons of marginal linear predictions can be seen in Table 9. Significant differences in the marginal means exist for two of the six possible pairwise combinations.

Research Question 7

Robust linear regression was used to test the relationship between frequency of postsecondary guidance counseling and the number of major changes participants made. Again, two models were tested—one including upperclassmen regardless of whether or not they reported ever changing majors and one including just those who reported having

Table 8

Robust Regression Results – Research Question 6

Model	β	Std. Err.	*t*	*p*
1. Times changed major (all)				
Overall model				
PSGC	.053	.070	.77	.444
Gifted	-.011	.056	-.19	.849
PSGC*Gifted	-.038	.078	-.49	.627
2. Times changed major (just changers)				
Overall model				
PSGC	-.143	.109	-1.28	.203
Gifted	-.224	.085	-2.42	.016
PSGC*Gifted	.251	.113	2.14	.033

1. $F = .41(3, 627)$, $p = .756$, $R^2 = .002$
2. $F = 2.80(3, 287)$, $p = .040$, $R^2 = .028$

Table 9

Marginal Means and Pairwise Comparisons

Group	Margin	Group Comparison	Contrast	Std. Err.	*p*	95% CI
P_0,G_0	1.74	P_0,G_1 vs P_0,G_0	-.382	.158	.016	[-.692, -.071]
P_0,G_1	1.36	P_1,G_0 vs P_0,G_0	-.237	.186	.203	[-.602, .129]
P_1,G_0	1.50	P_1,G_1 vs P_0,G_0	-.160	.168	.341	[-.492, .171]
P_1,G_1	1.58	P_1,G_0 vs P_0,G_1	.145	.132	.273	[-.115, .405]
		P_1,G_1 vs P_0,G_1	.222	.106	.038	[.012, .431]
		P_1,G_1 vs P_1,G_0	.076	.145	.598	[-.209, .362]

Note. P_0 = No participation in PSGC, P_1 = Participation in PSGC, G_0 = Non-gifted, G_1 = Gifted

changed their major at least once. The results of both regression analyses including the two main effects and interaction showed poor model fit and no significance.

Path Analysis Results

Research Question 8

Path analysis using full information maximum likelihood was employed to investigate the relationship between the endogenous variables of participation in postsecondary guidance counseling and number of major changes and the exogenous variable of perceived stress over the course of the undergraduate education, with a mediating variable of number of semesters enrolled before making the first major change. The results of the path analysis (standardized coefficients and their standard errors) can be seen in Figure 2. Though the likelihood ratio test indicates good model fit (χ^2 (1) = .15, p = .699) it is necessary to look at other indices of fit that are not so influenced by factors like sample size. Though the model is technically overidentified with one degree of freedom, other goodness of fit indices either indicate or approach perfect fit (RMSEA = .000, CFI = 1.000, SRMR = .002). However, this is the model that best answers the research question and thus model fit is considered secondary to the nature of the path coefficients. The overall R^2 of the model is 9.5%, but most of that variance is explained in the mediating exogenous variable (R^2 = 8.8%).

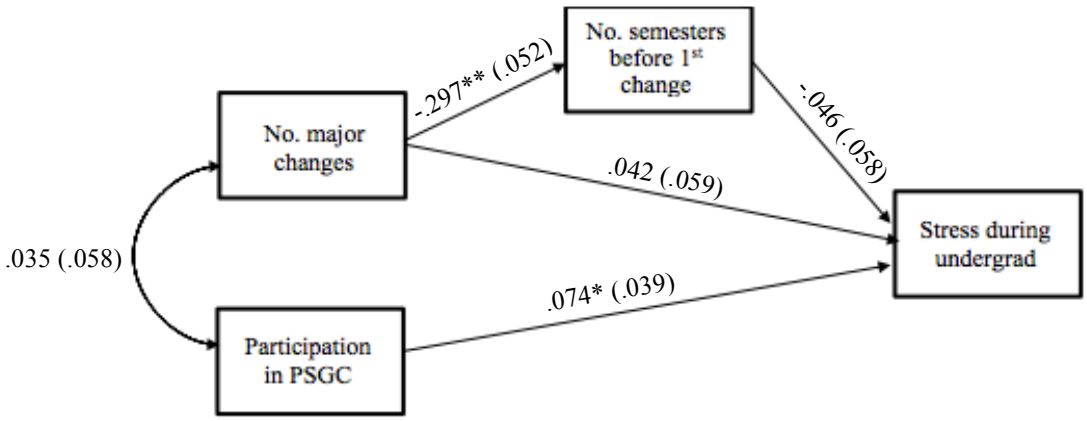

Figure 2. Results of path analysis for research question 8. Standardized path coefficients and their standard errors are reported.
*$p < .10$. **$p < .001$.

CHAPTER V

DISCUSSION AND CONCLUSIONS

As detailed in Chapter I, the research questions addressed in this dissertation were:

1. Do major changing trends (i.e., (a) number of major changes, (b) timing of major changing, and (c) reasons for changing differ for the gifted student population and general student population?
2. Is there a difference in stress perceived surrounding (a) major changing and/or (b) the overall undergraduate experience between gifted and non-gifted students?
3. To what extent do students (a) perceive additional cost of education and time to degree as outcomes related to major changing, and (b) is there a difference in these perceptions depending on the number of times they change majors?
4. (a) Do gifted students report more or less satisfaction with and perceived helpfulness of postsecondary guidance counseling while in high school than non-gifted students? (b) Among gifted students, does the types of counselor they received postsecondary counseling from affect how satisfied with and/or helpful they find such counseling?
5. Can (a) satisfaction with postsecondary guidance counseling predict perceived stress surrounding major changing and (b) is there a difference between gifted and non-gifted students?
6. Does (a) participation in postsecondary guidance counseling affect the number of times students change majors and (b) is there a difference between gifted and

non-gifted students?

7. Does (a) the frequency of meeting with counselors regarding postsecondary guidance predict the number of times students change majors in college and (b) is there a difference between gifted and non-gifted students?
8. Can satisfaction with postsecondary guidance counseling, number of times changing majors, and the number of semesters enrolled before changing majors explain the general stress perceived by college students?

This concluding chapter will include a discussion of each question individually followed by a general discussion of findings and concluding remarks.

Individual Research Questions

Research Question 1: Major Changing Trends

Results showed that there was no significant difference between gifted and non-gifted participants in the number of times they changed majors or in the timing of their major changing. Timing of the first major change occurred on average between the second third semester for both groups, and though the gifted sample reported changing to their assumed final major earlier than the non-gifted group there was still no significant difference (2.95 and 3.22, respectively).

As can be seen in Table 4, just 40.6% of the total sample reported having changed their major. Among seniors and graduate students, that percentage jumps just slightly to 43.0%. This is just half the national estimate of 80% (NCES, 2014), indicating that this sample is likely not representative. Furthermore, students in this sample changed majors fewer times than the national estimate—an average of 1.44 times

for the whole sample and 1.52 times for seniors and graduate students as compared to a national average of three times.

In terms of reasons for major changing, both the gifted and non-gifted groups cited interest-related reasons and poor performance most frequently, a finding that reflects the results of Holland and Nichol's 1964 study. Whereas the non-gifted group cited switching majors because of the potential to make more money in the new major for 8.8% of their major changes, the gifted group cited the same reason for 6.3% of changes. This difference, however, is arguably negligible for two reasons; first, because money-related reasons rank in at the fourth most commonly cited for changing among the gifted sample—thus just barely less frequently cited than career-related reasons—and second, because these estimates rely only on frequency of responses and nothing can be said about how reasons would rank in these groups in the larger national student population. Thus, for example, it would be wrong to conclude that gifted students care less about studying a field with higher earning potential than non-gifted students, or that non-gifted students are less likely to change their major because the career opportunities available to them after earning a degree in that field do not align with their career goals. More research would need to be done to make more accurate claims regarding reasons behind major changing between the two groups.

Research Question 2: Perceived Stress

Gifted students reported slightly higher levels of stress than non-gifted students in terms of both stress surrounding major changing and perceived stress overall during their undergraduate education, but the difference was not statistically significant. The

difference between the two groups' perceived general stress during their undergraduate education did, however, border on significance (p = .067). Higher perceived stress among students in the gifted student population is something we would perhaps expect to see as that finding coincides with many years of previous research findings (Kaplan, 1990; Peterson, Duncan, & Canady, 2009; Torrance, 1971).

Research Question 3: Factors of Major Changing Stress

As was discussed in Chapters I and II, very little is known about the negative perceptions students hold and what possible negative outcomes they experience due to frequent major changing. It was hypothesized that part of the stress experienced due to (frequent) major changing comes from the possibility of increased time to degree and, thus, cost of education. However, the consensus among students in this sample was neither agreement nor disagreement that major changing increased their time to degree or cost of their education. Of course, something that was not accounted for in this study was the likely possibility that many students do not pay for their own education, and thus tend to not consider education-related finances.

When senior and graduate level major changers were split into two groups—those who changed majors once and those who changed more than once—there was a clear difference in agreement that major changing increased both time to degree and cost of education. Whereas those who changed majors just once tended to disagree with the outcomes, those who changed majors more than once approached partial agreement, but more so in regards to increased time to degree. This follows logic as major changing sometimes means a loss of applicable credits toward the degree, additional required

credit hours, and/or introduction to a new major that the student may or may not end up enjoying which begins the cycle of decision-making again.

Research Question 4: Satisfaction with Postsecondary Guidance Counseling

Gifted and non-gifted students reported nearly exactly the same level of agreement in satisfaction with the postsecondary guidance counseling they received in high school, falling between *Neither agree or disagree* and *Somewhat agree*. Non-gifted students reported slightly higher agreement than gifted students that the postsecondary guidance counseling they received was helpful, but the difference was not significant. While it is obviously a good thing that students' levels of satisfaction and perceived helpfulness approached agreement versus disagreement, the very moderate estimates reveal that they believe they could have (or should have) gotten more from that counseling.

Perhaps a more telling finding is the difference in satisfaction and perceived helpfulness that gifted students report depending on the type of school counselor from which they received counseling. Gifted students who had received at least some of their postsecondary guidance counseling from gifted-specific faculty and/or counselors reported significantly higher satisfaction and perceived helpfulness than gifted students who had received the counseling from regular school counselors.

Research Question 5: Satisfaction Predicting Stress Due to Major Changing

Satisfaction with postsecondary guidance counseling in high school was not found to be a significant predictor of perceived stress due to major changing in either group. This simply means that there is little evidence in the data to suggest that the null

hypothesis is false; that is, there is no credible evidence from the data that satisfaction with counseling is related to perceived stress due to major changing, but the data also offers no proof that a relationship is nonexistent. Further research with different (and ideally more representative) samples is needed in order to make any evidence-based claims about the predictive relationship of satisfaction with counseling and perceived stress due to major changing.

Research Question 6: Counseling Participation and Number of Major Changes

Participation in postsecondary guidance counseling was not found to be a significant predictor of the number of major changes in upperclassmen and graduate students when the model included cases of individuals who reported never having changed their major. On the other hand, when just those who reported changing their major at least once were considered in the model, significance was found. Specifically, the impact of receiving postsecondary guidance counseling on the number of major changes varied between the gifted and non-gifted groups.

The marginal means show that, for the non-gifted group, those who did not receive postsecondary guidance counseling had a higher average number of major changes than those who did receive counseling (1.74 and 1.50, respectively). In the gifted group, those who did not receive counseling had a lower average number of major changes than those who did receive counseling (1.36 and 1.58, respectively). Upon scrutiny of the significant pairwise comparisons (Table 9), we see that (1) among students who do not receive counseling gifted students change majors significantly less than non-gifted students do, and (2) among students who do receive counseling gifted

students change their majors significantly more than non-gifted students do.

If appropriate and adequate postsecondary guidance counseling is indeed a way to help mitigate the number of major changes students make during their time in college, then the results for the non-gifted group are what we would expect to see. It is curious, however, that this relationship is reversed for gifted students. Considering that, overall, gifted students reported less satisfaction with the counseling they received, these results could point to an effect of that discontent. That is, gifted students may be more likely to jump around from major to major because they are cognizant of the fact that their postsecondary counseling was under par, and thus believe that "testing out" different majors is the only way to determine the field for which they are best suited. That is one possible explanation. While this finding is interesting, speculation as to the reason behind it must remain speculation considering the relatively low R^2 value. Further research should be conducted to determine this relationship in other gifted and non-gifted samples.

Research Question 7: Frequency of Counseling and Number of Major Changes

Frequency of participation in postsecondary guidance counseling was not found to be a significant predictor of number of major changes in its own right *or* when the gifted interaction was introduced into the model. Like the results discussed for research question 5, this means there is no credible evidence from the data to suggest that frequency of participation in counseling is related to number of major changes.

In future research, measurement of frequency should perhaps be different from how it was measured in the current study. Though it was ultimately treated as a

continuous predictor in the analysis, response options for the item on the survey included four categories: 1 – 2 times, 3 – 4 times, 4 – 5 times, 6 or more times. For many participants taking the survey, they had to recall this information from anywhere between three and ten years ago (and possibly even longer). Thus, response categories were created to help participants answer to question to the best of their knowledge. The downside of this, of course, is the loss of information assuming participants actually recalled the exact number of times they spoke with a counselor regarding their plans after graduation from high school. Perhaps future studies should require participants to report an exact number of times.

Research Question 8: Path Model

Interestingly, participation in postsecondary guidance counseling was found to significantly predict higher levels of perceived stress during college at the $p < .05$ level. Given previous findings—that is, higher average number of major changes among gifted students who received counseling versus non-gifted who did not—it might make sense that this is an effect of spuriousness. Future models should consider inclusion of other variables that might better explain the relationship (or lack thereof).

The number of times changing majors was modeled to have both an indirect and direct effect on stress during college. However, it was not found to significantly contribute to stress during college, nor does the indirect effect mediated by the number of semesters enrolled before changing majors indicate a significant contribution.

General Discussion

Though some of the slightly more complex models used to answer research

questions in this study did not yield informative results, some noteworthy findings were still found.

In general, major changing trends and considerations of major changing and participation in postsecondary guidance counseling did not differ between the gifted and non-gifted samples. However, gifted upperclassmen did report higher perceived stress than non-gifted upperclassmen during their undergraduate education as a whole. Though this is what was perhaps expected, most of the previous literature and research conducted on gifted student stress has dealt with students between the ages of 13 and 17 (e.g., Clemens & Mullis, 1981; Kaplan & Geoffroy, 1993; Peterson, Duncan, & Canady, 2009; Shaunessy & Suldo, 2010), prior to their entry to college. The other difference between the gifted and non-gifted samples, specifically, dealt with the participation in postsecondary guidance counseling of those who ended up changing majors at least once and how that affected the number of major changes they made. However, it is clear from the results that it would be unwise to say postsecondary guidance counseling is the sole or even the main cause of frequent major changing, as it accounted for just 2.8% of the variance in the dependent variable.

Though a number of the primary research questions failed to confirm patterns of differences between the two main groups of interest, some patterns of secondary interest were found. Agreement with an increase in cost of education and increased time to degree due to major changing was generally not reported in the sample, but those who changed majors more than once reported significantly higher agreement than those who changed majors just once, indicating some support for the hypothesis that these are some

potential negative outcomes of frequent major changing. Lastly, gifted students who received postsecondary guidance counseling from regular school counselors reported significantly lower agreement than gifted students who did not. This finding supports previous research that suggests many school counselors are unprepared to meet the counseling needs of gifted students (e.g., Test, 2015, and Peterson, 2006). The practical implication is that there needs to be more training opportunities for school counselors in understanding and addressing counseling needs of gifted students. It is irresponsible to assume school counselors have this training, or even that gifted faculty is proactively addressing students' needs. In this study, just 2.1% of gifted students reported receiving counseling from a gifted advisor or faculty member, and an additional 5.1% reported having received at least some of their counseling from a gifted advisor or faculty member.

Ultimately, it is not possible to state the exact cause of major changing in this study beyond the reasons that the students themselves report. There is preliminary evidence that postsecondary guidance counseling may play some role, but it is unclear how large that role is. Once more is known about the different factors that influence major changing more can be discovered about what differences exist between gifted and non-gifted groups.

Further Implications

In addition to the implications discussed in the previous individual and general discussion sections, deserving of some discussion is the lack of model fit and statistical significance when all upperclassmen, including those who had never changed majors,

were included in analyses. Only when just major changers were included could results be interpreted meaningfully. There could be some fundamental difference between major non-changers and major changers. This could mean that both participation in postsecondary guidance counseling and frequency of that counseling if it is received are ultimately unrelated to the decision to not change majors (as is evidenced by their Spearman's rho correlation and phi coefficient of .008 and .007, respectively).

It could also be an indicator of some other untested fundamental difference between the two groups, such as demographic factors. Gender and ethnicity, though not of interest in the current study, could account for some significant difference between major changers and major non-changers. Tables 10 and 11 show breakdowns of gender and ethnicity between the two groups—also divided by underclassmen, upperclassmen/gifted, and total sample—and considering the disparities (particularly among females and Asian students) it is certainly an area that should be further explored.

Limitations

Measurement validity. Particularly in survey research, it is important to consider threats to measurement validity. As Devellis (as cited in Ruel, Wagner, and Gillespie, 2016) explains, measurement validity is "the extent that a survey item (or group of items) elicits an accurate description of its target concept" (p. 88). The content validity of this study is arguably lacking as just a few potential factors influencing major changing were investigated. There are likely many other factors that need to be investigated, particularly as they apply to potential negative outcomes of frequent major changing.

Though measurement validity is difficult to assess in this study given its exploratory nature, there is some evidence for construct validity, or evidence that the instrument is successful in measuring the actual construct it intends to. The inclusion of the PSS as an objective measure of stress was meant to inform construct validity, and the correlation of scores on the PSS and student responses regarding the amount of stress they have perceived over the course of college provides evidence for this form of validity ($r_s = .543$, $p < .01$).

Internal validity. Confounding effects are of particular concern in this study. The models fail to control for factors like demographics or other unseen variables that hold explanatory power. See the Further Implications section above for further discussion.

It is possible that social desirability affected some participants, particularly when it came to indicating gifted status. A significant proportion of respondents offered their email address at the start of the study in order to be entered into the drawing for a gift card, and thus they may have felt their identity was not anonymous. Thus, it is conceivable that students who may not have actually been systematically identified as gifted indicated that they were.

External validity. Conceivably the largest threat to external validity is that the sample is made up of students from a single university. The results suggest that this sample is not a representative one, and thus population generalization is not warranted. For example, whereas the projected average percentage of major changers nationwide is 80%, just 43% of seniors and graduate students in this sample reported having changed

majors. The nationwide average number of major changes among changers nationwide is three, and in this sample the average is just 1.52. According to an online visualization provided by the university's Data and Research Services office, in 2012 just 21.4% of students graduated after four years with their initially declared major. This statistic is on par with the national projection of 80% changing majors. Nevertheless, a difference of 35.6% between the sample and what is reported for this university is quite large and thus it is important not to generalize.

Survey research inherently carries another threat to population generalization: survey respondent bias. Many studies have found that, for web surveys, females are more likely to respond than males and underrepresented minority groups are less likely to respond than whites (see Mackety, 2007; Rosenthal & Rosnow, 1975; Underwood, Kim, & Matier, 2000). As per the Spring 2016 enrollment report for the university which the respondents for the current study were sampled from, the breakdown of ethnicity is as follows (estimates are for that ethnicity *only*, not including multiple ethnicities): 59.4% White, 19.6% Hispanic/Latino, 5.6% Asian, 3.7% African Americans, .2% American Indian, and .1% Native Hawaiian. Both Whites and Asians were overrepresented in the sample.

Because of the exploratory nature of this study, it is important to consider that the reported results are specific to this sample. Cook and Campbell (1979) refer to this phenomenon as "overfitting." It is only possible to confirm whether overfitting of results is an issue if the study is replicated with different samples.

Other study limitations. Another limitation of this study relates to the types of

items participants to which participants were asked to respond. Though there seems to be no concrete standard for the number of response categories rating scales should have (see Krosnick & Presser, 2010), the general rule of thumb is that scales should include five to seven response categories. Items related to stress in the survey instrument used in this study included only four response categories (No stress at all, A little stress, A moderate amount of stress, and A lot of stress). Perhaps it would have been preferable to measure them using the five-point agreement Likert scale used for other items, but it was ultimately decided to use the four-point scale for ease of translation in reporting. If future studies are to include student self-reports of stress perhaps researchers should consider revising the scale to reflect a wider range of response options.

There is some vagueness in the wording of particular items on the survey tool that may carry implications for the results to which they are tied. For example, participants were asked to respond with their agreement to items like *The postsecondary guidance counseling I received was helpful* and *I am satisfied with postsecondary guidance counseling I received.* Both the terms *helpful* and *satisfied* may carry different meanings from student to student. Future survey instruments created to investigate the same topic should consider this and include multiple items for each construct to ensure convergent validity.

Last, the decision to include juniors in some of the analyses of upperclassmen was mostly to ensure adequate sample size. Though, as posited previously, it is far more unlikely for students at the junior class level to continue changing majors than it is for underclassmen there remains a possibility that some juniors included in the analyses

were not in fact finished changing majors. Just six of the 255 junior respondents reported that they were currently either not in the major they intended to graduate in or they were not sure that they were. Though this percentage is very small, it is possible (and perhaps probable) that some of the junior respondents will go on to change majors. Though the resulting difference would likely be small, the inclusion of these juniors in some of the analyses may have deflated what would actually be true regarding the average number of major changes at the end-of-college experience.

Future Research

Discussion of future research areas has been interspersed throughout this dissertation, so in this section it will be brought together and synthesized.

Even in the recent literature there is an abundance of work aimed at studying stress among college students (e.g., Coiro, Bettis, & Compas, 2017; Karatekin, 2017; Li & Yang, 2016; Sharp & Barney, 2016). Far, far fewer results appear when searching the literature for articles related to stress of gifted college students. Related topics concerning Honors and high-achieving students are present (e.g., Rice, Leever, & Christopher, 2006; Rockey, 2015), but not much more present than those particular to specifically gifted groups. This could be because it is much simpler to obtain access to younger gifted groups. In elementary school across the nation, there are intact gifted populations that are easily accessible. Obtaining a large enough sample of gifted college-aged participants is a much more difficult task as it becomes more challenging to not only verify giftedness but also to construct a sample that was identified using the same or similar methods. Though a much more daunting undertaking, such a study would have

the potential to be a seminal one.

In regards to postsecondary guidance counseling in schools, it would be useful to see more research investigating what exactly is covered and what approaches are taken in "career counseling" and "college planning" in high school guidance offices across the country. This information is quite pertinent to future studies on counseling as it relates to major changing because different methods might be more helpful in terms of examining student interests.

Another topic area worth studying is student access to and involvement in various work-related experiences while in high school. A study published by Papadimitriou (2014) evaluated student perceptions of their internship experiences while in high school. It was discovered that in the sample of 52 students, 47% reported that participation in internships was an important factor in their decision of choosing a college major. It would be interesting for future research to take a study like this a step further and investigate major changing trends of students who participated in internships and those who did not.

Last, as was briefly discussed previously, demographic characteristics should be considered in future research on the topic of major changing. Among upperclassmen in this study, a far higher percentage of females changed majors than males (50.2% versus 38.2%, respectively), and about half of students within every ethnic group reported changing majors except for Asian students (28.5%). If these trends were replicable, it would be interesting to examine their underlying reasons

Conclusion

The overarching goal of this dissertation as an exploratory study was threefold: (1) to determine the influence postsecondary guidance counseling on major changing, (2) to determine the influence of major changing trends on possible negative outcomes for college students, (3) to determine the extent to which the gifted student population perceived these negative outcomes in comparison to their non-gifted peers. As an exploratory topic, it may have been more focused than would perhaps be considered justified. It is highly probable that there are a number of other factors that influence frequent major changing that were not identified here, and thus it was perhaps premature to begin considering these effects on gifted students versus non-gifted students at this juncture.

Despite this, some important findings were uncovered and provide the basis for future research. The driving importance of understanding and studying this topic is maintained. So much educational research is focused on school-aged students, and rightfully so, but pushed to secondary importance is research regarding the slightly older student who is suddenly immersed in one of the most stressful times in a young adult's life. Future research should continue to consider ways to minimize unnecessary stressors in the lives of college students, particularly in the gifted student population as they are at a higher likelihood of stress and displacement.

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APPENDIX

SURVEY INSTRUMENT

Sex:
- ❍ Male
- ❍ Female

Age:

Predominant race/ethnicity:
- ❍ African American
- ❍ American Indian or Alaska Native
- ❍ Asian
- ❍ Hispanic/Latino/Latina
- ❍ Native Hawaiian or other Pacific Islander
- ❍ White
- ❍ Other

What is your current class status at Texas A&M?
- ❍ Freshman
- ❍ Sophomore
- ❍ Junior
- ❍ Senior
- ❍ Graduate student

Display This Question:
If What is your current class status at Texas A&M? Graduate student Is Selected

Did you finish your undergraduate degree within the last 10 years?
- ❍ Yes
- ❍ No

Condition: No Is Selected. Skip To: End of Survey.

Display This Question:
If What is your current class status at Texas A&M? Graduate student Is Not Selected

How many credit hours have you completed toward your undergraduate degree? (This may include credits that have been transferred from a different undergraduate university.)

_____ Credit hours completed

Were you identified as intellectually gifted at any point from pre-school to high school?
- ❍ Yes
- ❍ No

Display This Question:

If Were you identified as intellectually gifted at any point from pre-school to high school? Yes Is Selected

When were you identified as intellectually gifted?

- ❍ Pre-school/Pre-K
- ❍ Elementary school (K - 5th grade)
- ❍ Middle school (6th - 8th grade)
- ❍ High school (9th - 12th grade)

Display This Question:

If Were you identified as intellectually gifted at any point from pre-school to high school? Yes Is Selected

What was the identification process used by your school to determine whether or not you were intellectually gifted? Check all that apply.

- ❑ Grades/classroom performance
- ❑ Standardized achievement tests (e.g., STAAR, TAKS)
- ❑ IQ/aptitude tests (e.g., Woodcock Johnson, Iowa Test of Basic Skills, CogAT)
- ❑ Teacher/administrator nomination
- ❑ Parent nomination
- ❑ Self-nomination
- ❑ I do not remember/Unknown
- ❑ Other

Display This Question:

If Were you identified as intellectually gifted at any point from pre-school to high school? Yes Is Selected

After you were identified as intellectually gifted, did you participate in any gifted programming during any of the following years? Check all that apply. (Note: This may include enrichment classes, independent study, compacting, ability grouping, etc.)

- ❑ Pre-school
- ❑ Elementary (anytime during K - 5th)
- ❑ Middle school (anytime during 6th - 8th)
- ❑ High school (anytime during 9th - 10th)

Did not participate in gifted programming/Participated only in the regular classroom

Display This Question:

If After you were identified as intellectually gifted, did you participate in any gifted programming during any of the following years? Pre-school Is Selected

Or After you were identified as intellectually gifted, did you participate in any gifted programming during any of the following years? Middle school Is Selected

Or After you were identified as intellectually gifted, did you participate in any gifted programming during any of the following years? High school Is Selected

Or After you were identified as intellectually gifted, did you participate in any gifted programming during any of the following years? Elementary Is Selected

How many years did you participate in gifted programming?

- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10
- ❍ 11
- ❍ 12
- ❍ 13

Did your high school have counselor(s) whose sole responsibility was advising students in college preparation or career counseling?

- ❍ Yes
- ❍ No
- ❍ I don't know
- ❍ Not applicable, I was homeschooled

In high school, did you ever receive postsecondary guidance counseling? (This type of counseling includes college preparation advising, career counseling, taking career interest inventories given to you by a school counselor, etc. The key idea here is that you interacted with school counselor or advisor about your future after high school.)

- ❍ Yes
- ❍ No
- ❍ I don't remember

Display This Question:

If In high school, did you ever receive postsecondary guidance counseling? Yes Is Selected

How many times did you meet with a school counselor about your future after high school?

- ❍ 1-2 times
- ❍ 3-4 times
- ❍ 5-6 times
- ❍ More than 6 times

Display This Question:

If Were you identified as intellectually gifted at any point from pre-school to high school? Yes Is Selected

And In high school, did you ever receive postsecondary guidance counseling? Yes Is Selected

Was any of the postsecondary guidance counseling you received conducted by a gifted counselor/teacher or by a regular school counselor?

- ❍ Gifted counselor/teacher
- ❍ Regular school counselor
- ❍ Both

Display This Question:

If In high school, did you ever receive postsecondary guidance counseling? Yes Is Selected

Did you seek out postsecondary guidance counseling or was it required by your school?

- ❍ Sought help
- ❍ Required
- ❍ I don't know/Don't remember

Display This Question:

If In high school, did you ever receive postsecondary guidance counseling? No Is Selected

Please answer the following questions based on the provided scale:

	Not at all	Somewhat	Very much
How much do you wish you would have received postsecondary guidance counseling in high school?	❍	❍	❍
How much do you think receiving these counseling services would have affected the ease with which you entered college?	❍	❍	❍

Display This Question:

If In high school, did you ever receive postsecondary guidance counseling? Yes Is Selected

Please respond to the following statements based on the provided scale:

	Strongly disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Strongly agree
I found the postsecondary guidance counseling I received in high school helpful	❍	❍	❍	❍	❍
I am satisfied with the postsecondary guidance counseling I received in high school	❍	❍	❍	❍	❍

Did you enter college directly after high school (i.e., the following fall semester)?

❍ Yes

❍ No

Display This Question:

If Did you enter college directly after high school (i.e., the following fall semester)? No Is Selected

How many semesters passed before you enrolled in college after high school (not including summers)?

❍ 1

❍ 2

❍ 3

❍ 4

❍ 5

❍ 6

❍ 7

❍ 8

❍ More than 8

Did you enter college with a declared major?

❍ Yes

❍ No

Display This Question:
If Did you enter college with a declared major? No Is Selected

How many semesters did you take classes before declaring a major?

- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ I have not yet declared a major

Display This Question:
If Did you enter college with a declared major? Yes Is Selected
Or How many semesters did you take classes before declaring a major? I have not yet declared a major Is Not Selected

What was your first declared major during your undergraduate education?

Display This Question:
If How many semesters did you take classes before declaring a major? I have not yet declared a major Is Not Selected

Have you ever changed your undergraduate college major?

- ❍ Yes
- ❍ No
- ❍ No, but I'm thinking about it

Display This Question:
If Have you ever changed your undergraduate college major? No Is Selected

Did you ever consider or have you ever considered changing your college major?

- ❍ Yes
- ❍ No

Display This Question:
If Did you ever consider or have you ever considered changing your college major? Yes Is Selected

What is the main reason you decided NOT to change your college major?

- ❍ I ended up really liking my major
- ❍ I had friends in the same major
- ❍ I was afraid I wouldn't graduate on time if I changed
- ❍ My family and/or friends wanted me to continue in my major
- ❍ I didn't want to talk to an advisor
- ❍ I didn't want to feel like I had wasted time
- ❍ Other (please explain) _____

Display This Question:

If Have you ever changed your undergraduate college major? Yes Is Selected

How many times have you changed/did you change your college major during your undergraduate education?

- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ More than 6

Display This Question:

If How many times have you changed/did you change your college major during your undergraduate educa... 1 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 2 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 3 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 4 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 5 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 6 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... More than 6 Is Selected

During (or after) which semester in college did you change from your FIRST major to your SECOND major? (Not including summer semesters)

- ❍ 1st
- ❍ 2nd
- ❍ 3rd
- ❍ 4th
- ❍ 5th
- ❍ 6th
- ❍ 7th
- ❍ 8th
- ❍ After my 8th semester

Display This Question:

If How many times have you changed/did you change your college major during your undergraduate educa... 1 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 2 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 3 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 4 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 5 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... 6 Is Selected

Or How many times have you changed/did you change your college major during your undergraduate educa... More than 6 Is Selected

What major did you switch to? _____

Display This Question:

If 1 Is Selected

Or 2 Is Selected

Or 3 Is Selected

Or 4 Is Selected

Or 5 Is Selected

Or 6 Is Selected

Or More than 6 Is Selected

What was your MAIN reason for changing your first major?

- ❍ Not interested in the subject matter
- ❍ Couldn't understand the subject matter
- ❍ Was performing poorly
- ❍ Wanted to be in a field where I can make more money
- ❍ Wanted to be in a field that allows me to travel
- ❍ Didn't like my in-major peers
- ❍ Family/friend influence
- ❍ Other (please explain) _____

Display This Question:
If 2 Is Selected
Or 3 Is Selected
Or 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

During (or after) which semester in college did you change from your SECOND major to your THIRD major? (Not including summer semesters)

- ❍ 1st
- ❍ 2nd
- ❍ 3rd
- ❍ 4th
- ❍ 5th
- ❍ 6th
- ❍ 7th
- ❍ 8th
- ❍ After my 8th semester

Display This Question:
If 2 Is Selected
Or 3 Is Selected
Or 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What major did you switch to?

Display This Question:
If 2 Is Selected
Or 3 Is Selected
Or 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What was your MAIN reason for changing your second major?

- ❍ Not interested in the subject matter
- ❍ Couldn't understand the subject matter
- ❍ Was performing poorly
- ❍ Wanted to be in a field where I can make more money
- ❍ Wanted to be in a field that allows me to travel
- ❍ Didn't like my in-major peers
- ❍ Family/friend influence
- ❍ Other (please explain) _____

Display This Question:
If 3 Is Selected
Or 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

During (or after) which semester in college did you change from your THIRD major to your FOURTH major? (Not including summer semesters)

- ❍ 1st
- ❍ 2nd
- ❍ 3rd
- ❍ 4th
- ❍ 5th
- ❍ 6th
- ❍ 7th
- ❍ 8th
- ❍ After my 8th semester

Display This Question:
If 3 Is Selected
Or 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What major did you switch to?

Display This Question:
If 3 Is Selected
Or 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What was your MAIN reason for changing your third major?

- ❍ Not interested in the subject matter
- ❍ Couldn't understand the subject matter
- ❍ Was performing poorly
- ❍ Wanted to be in a field where I can make more money
- ❍ Wanted to be in a field that allows me to travel
- ❍ Didn't like my in-major peers
- ❍ Family/friend influence
- ❍ Other (please explain) _____

Display This Question:
If 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

During (or after) which semester in college did you change from your FOURTH major to your FIFTH

major? (Not including summer semesters)

- ❍ 1st
- ❍ 2nd
- ❍ 3rd
- ❍ 4th
- ❍ 5th
- ❍ 6th
- ❍ 7th
- ❍ 8th
- ❍ After my 8th semester

Display This Question:
If 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What major did you switch to?_____

Display This Question:
If 4 Is Selected
Or 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What was your MAIN reason for changing your fourth major?

- ❍ Not interested in the subject matter
- ❍ Couldn't understand the subject matter
- ❍ Was performing poorly
- ❍ Wanted to be in a field where I can make more money
- ❍ Wanted to be in a field that allows me to travel
- ❍ Didn't like my in-major peers
- ❍ Family/friend influence
- ❍ Other (please explain) _____

Display This Question:
If 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

During (or after) which semester in college did you change from your FIFTH major to your SIXTH major? (Not including summer semesters)

- ❍ 1st
- ❍ 2nd
- ❍ 3rd
- ❍ 4th
- ❍ 5th
- ❍ 6th
- ❍ 7th
- ❍ 8th
- ❍ After my 8th semester

Display This Question:
If 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What major did you switch to?

Display This Question:
If 5 Is Selected
Or 6 Is Selected
Or More than 6 Is Selected

What was your MAIN reason for changing your fifth major?

- ❍ Not interested in the subject matter
- ❍ Couldn't understand the subject matter
- ❍ Was performing poorly
- ❍ Wanted to be in a field where I can make more money
- ❍ Wanted to be in a field that allows me to travel
- ❍ Didn't like my in-major peers
- ❍ Family/friend influence
- ❍ Other (please explain) _____

Display This Question:
If 6 Is Selected
Or More than 6 Is Selected

During (or after) which semester in college did you change from your SIXTH major to your SEVENTH major? (Not including summer semesters)

- ❍ 1st
- ❍ 2nd
- ❍ 3rd
- ❍ 4th
- ❍ 5th
- ❍ 6th
- ❍ 7th
- ❍ 8th
- ❍ After my 8th semester

Display This Question:
If 6 Is Selected
Or More than 6 Is Selected

What major did you switch to?

Display This Question:
If 6 Is Selected
Or More than 6 Is Selected

What was your MAIN reason for changing your sixth major?

- ❍ Not interested in the subject matter
- ❍ Couldn't understand the subject matter
- ❍ Was performing poorly
- ❍ Wanted to be in a field where I can make more money
- ❍ Wanted to be in a field that allows me to travel
- ❍ Didn't like my in-major peers
- ❍ Family/friend influence
- ❍ Other (please explain) _____

Display This Question:
If What is your current class status at Texas A&M? Graduate student Is Not Selected
And How many semesters did you take classes before declaring a major? I have not yet declared a major Is Not Selected

Are you currently in the major you plan to graduate in?

- ❍ Yes
- ❍ No
- ❍ Not sure

Display This Question:
If What is your current class status at Texas A&M? Graduate student Is Selected
Or Are you currently in the major you plan to graduate in? Yes Is Selected

Please answer the following question based on the scale below:

	Very unhappy	Somewhat unhappy	Indifferent	Somewhat happy	Very happy
How happy are/were you with your final declared undergraduate major?	❍	❍	❍	❍	❍

Please answer the following questions based on the scale below:

	No stress at all	A little bit of stress	A moderate amount of stress	A lot of stress
If Have you ever changed your undergraduate college major? Yes Is Selected				
How much stress did you experience due to changing your major?	❍	❍	❍	❍
In general, how much stress did you experience/are you experiencing during your undergraduate education?	❍	❍	❍	❍

Display This Question:
If Have you ever changed your undergraduate college major? Yes Is Selected

Please respond to the following statements regarding your experience of changing majors:

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Changing majors was a stressor for me during my undergraduate education	❍	❍	❍	❍	❍
The cost of my undergraduate education increased because of my decision to change majors	❍	❍	❍	❍	❍
The time spent working toward my undergraduate degree increased because of my decision to change majors	❍	❍	❍	❍	❍
I feel that with proper college preparation/career counseling while in high school I might not have changed majors	❍	❍	❍	❍	❍

Thinking back on the entirety of your undergraduate education [thus far], how often have you...

	Never	Almost Never	Sometimes	Fairly Often	Very Often
Been upset because of something that happened unexpectedly?	❍	❍	❍	❍	❍
Felt that you were unable to control the important things in your life?	❍	❍	❍	❍	❍
Felt nervous and "stressed"?	❍	❍	❍	❍	❍
Felt confident about your ability to handle your personal problems?	❍	❍	❍	❍	❍
Felt that things were going your way?	❍	❍	❍	❍	❍
Found that you could not cope with all the things that you had to do?	❍	❍	❍	❍	❍
Been able to control irritations in your life?	❍	❍	❍	❍	❍
Felt that you were on top of things?	❍	❍	❍	❍	❍
Been angered by things that were outside of your control?	❍	❍	❍	❍	❍
Felt difficulties were piling up so high that you could not overcome them?	❍	❍	❍	❍	❍