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**Social Support, Self-Efficacy, and Academic Outcomes in College Students**

Kasey Phelps

Bellarmino University

**Author Note**

This thesis was completed as part of an undergraduate requirement for the Bellarmine University Honors Program and was completed over the course of three academic semesters. The primary advisor for this thesis was Dr. Christy Wolfe, and the two readers for this thesis were Dr. Ainsley Lambert-Swain and Dr. Hank Rothgerber. The director of the Bellarmine University Honors Program is Dr. Jonathon Blandford.

### **Abstract**

When entering higher education, young adults are presented with a multitude of choice. Choosing a major, let alone a career, is a daunting task. In this thesis, STEM (science, technology, engineering, and math) careers are the focus. Why is it that, in modern day, there are still great disparities among women and sexual minorities within STEM? Women and sexual minorities have the interest; the issue lies within social support, as well as assumed gender roles. This thesis explores how differing measures of gender (in order to capture a participant's gender identity and gender expression) are vital to understanding more of their experience, and the role that this social identity piece plays within their choices. Due to the timing of data collection and analysis, this thesis presents preliminary data, as well as suggestions for future research.

### **Social Support, Self-Efficacy, and Academic Outcomes in College Students**

When a person goes to a university to get an education, they are pursuing a career. More people are pursuing college now, going into several different types of majors. As college students, we are each able to choose our own unique path to follow. There are several different paths that we may choose to go down, and although at times they may seem overwhelming and daunting, we are able to make the choice. Sometimes it does require some extra encouragement from what school demands of us, which pushes us into a decision. College students test majors and classes, and eventually land on something of interest, and are able to create a career with that interest and major.

What are we not aware of that influences our choices? Beyond interest, why do we fall into the majors that we do? These choices should not be taken lightly. Among our choices are (natural) science (e.g., chemistry, physics, biology, etc.), technology, engineering, or math majors – STEM majors. Individuals with a STEM degree may become doctors, dentists, software developers, engineers, statisticians, physical therapists, and so on. Acquiring a degree in a STEM field requires countless hours of studying, persistence, self-discipline, and dedication; STEM degrees and careers are very demanding. Because of these requirements, STEM degrees and STEM careers are highly respected and valued. This respect and value of STEM degrees makes this field competitive; individuals in STEM fields are typically ambitious. While this ambitious and arduous reputation and expectation often influence a student's decision to go into a STEM field or not, there are also underlying social and individual difference factors as to why an individual may not choose to go into a STEM field.

## **STEM Careers**

As careers that typically keep us safe, healthy, entertained, and informed, STEM careers are highly respected and typically give higher salaries than non-STEM careers. STEM careers include doctors, dentists, software developers, engineers, statisticians, physical therapists, and the list goes on. Additionally, according to the Pew Research Center, individuals with a STEM college degree make more money than individuals with degrees that are not in the STEM field, even if they have the same level of education. For example, individuals with a Master's degree in a non-STEM field have median annual earnings of \$67,847, while individuals with a Master's degree in a STEM field have median annual earnings of \$91,137, according to a 2014-2016 Pew Research Center analysis ("Women and Men in STEM Often at Odds Over Workplace Equity," 2018). Although two people may have the same level of education, individuals who hold degrees in STEM are more likely to receive higher annual earnings.

Further, individuals with a STEM college degree typically earn more annually than individuals with a non-STEM college degree, even if both individuals are working within a non-STEM job. Specifically, a 2014-2016 Pew Research Center survey reports that individuals who have a STEM college degree but are working within a non-STEM job have median annual earnings of \$70,885, while individuals who have a non-STEM college degree and are also working in a non-STEM job have median annual earnings of \$60,000 ("Women and Men in STEM Often at Odds Over Workplace Equity," 2018). STEM careers and degrees are highly valued within American society, often over other careers and degrees. This may be due the level of knowledge, ambition, and dedication required to excel in STEM fields, even with a bachelor's degree. This pay gap may also be due to the general favoritism within society moving towards more complex technologies and medicines, two things that require dedication and serious

attention. There is great importance placed upon careers that happen to be STEM related, though as a society we do need to see the importance within non-STEM careers. However, this is an argument for another paper.

**Gender Disparities in STEM.** Although STEM careers are generally well respected and valued, there are many disparities that exist within the demographics of who has a STEM job. There should be more diversity within all workplaces, though the STEM field especially lacks diversity. Specifically, for the purpose of this thesis, I would like to focus on the gender disparities that exist within STEM. Women are underrepresented within STEM jobs. Only 14% of people who are in engineering jobs are women, and women only make up 25% of computer jobs (“Women and Men in STEM Often at Odds Over Workplace Equity,” 2018). For your reference, “computer occupations [are...] job[s...] which includes computer scientists, systems analysts, software developers, information systems managers and programmers.” (“Women and Men in STEM Often at Odds Over Workplace Equity,” 2018). Comparably, on the other end, women make up 75% of health-related jobs, such as nursing (“Women and Men in STEM Often at Odds Over Workplace Equity,” 2018). These percentages reflect the disparities among career choice and the unevenness of representation. Women should be equally represented in STEM fields but are not; there is no equal representation of working women in STEM.

Additionally, the Pew Research Center presents figures showing that women are not pursuing STEM careers due to lack of interest. Women may receive a Bachelor’s degree within a STEM field, although they may not pursue that career. Specifically, 38% of women who were computer majors are working in computer jobs, compared to the 53% of men who were computer majors and are working in computer jobs. Women may pursue the STEM major that

they have interest in, though they do not pursue the job pertaining to their major (“Women and Men in STEM Often at Odds Over Workplace Equity,” 2018).

Further, diving deeper into these gender disparities within STEM, there also exists disparities within individuals who are part of the LGBTQ+ community. Hughes (2018) investigated the persistence of sexual minority students in STEM fields. This report indicates that in the traditional STEM fields of science, technology, engineering, and mathematics, those students who identified as sexuality minority were 7% less likely to persist in these majors. This report goes on to explain that despite this finding of decreased persistence in STEM fields that sexual minority STEM students were more likely to report participating in extracurricular activities such as undergraduate research programs. Hughes (2018) concluded that “the gender disparity in STEM retention appears to be reversed for sexual minority STEM students” (p. 1). These findings from Hughes show us that something other than a student’s interest is causing them to be pushed away from STEM. Sexual minority, or LGBTQ+, individuals seem to be excited about their involvement in STEM, as they were more likely to report participating in undergraduate research programs (Hughes, 2018), though they were still less likely than their heterosexual peers to continue with STEM. What causes them to turn away from STEM, despite their clear interest within the subject?

Interestingly as well, “the gender disparity in STEM retention appears to be reversed for sexual minority STEM students” (Hughes, 2018, p. 1). With the knowledge of potential differing gender roles, compared to heterosexual mainstream society, of LGBTQ+ individuals, and with the knowledge that 75% of individuals within health-related (caretaking) jobs are women, this indicates that potentially, gender roles play into these disparities within STEM, as well as the choices within academia that we make. I will touch on this again later.

If STEM careers are so respected and generally pay well, why is there such a great disparity in these numbers? How do we explain why the number of individuals who belong to certain gender groups in STEM jobs is disproportionately low compared to the regular workforce? What pieces are missing in order to make the STEM field more diverse and inviting? Why are individuals who are interested in STEM discouraged from pursuing a career in STEM? Some of the potential reasons that women give for not pursuing STEM are known, also presented by the Pew Research Center. The main reasons that U. S. adults perceive to explain the gender disparity within STEM are discrimination and lack of encouragement from others, as well as balancing work while balancing family (“Women and Men in STEM Often at Odds Over Workplace Equity,” 2018). This suggests that the role of social support within the STEM workplace, as well as the importance of social support within school, has an important position in major and career choice, as well as satisfaction and persistence.

### **Social Cognitive Career Theory**

A theory that will be partially applied to these questions of disparity within STEM is the social cognitive career theory (SCCT). The SCCT argues that several variables, which influence one another, influence the choices that we make. These variables are correlated with the choices we make in our majors and careers, and specifically the goals we wish to achieve through our majors and careers. These variables are social support, self-efficacy, outcome expectations, interest, and social barriers (Lent et al., 1994; 2000; as cited by Lent et al., 2005). Outcome expectations are defined to be “beliefs about the outcomes of engaging in particular courses of action” (Lent et al., 2005, p. 84).

The SCCT aims to describe the ways in which these variables “predict the interests and choice goals” (Lent et al., 2005, p. 85) of students; in Lent et al. (2005), this was specifically



investigated among engineering students. It was found “that social cognitive variables may be helpful in understanding the educational choice goals of engineering students, regardless of gender” (Lent et al., 2005, p. 91). This entanglement of variables is valuable, and must continue to be researched. Each of these variables are relevant, and their strength in relation to one another must be further explored.

The SCCT has been applied to the STEM field previously, although “there remains a need to examine the extent to which hypothesized predictor-criterion relationships hold across gender and race-ethnicity in science and engineering fields” (Lent et al., 2005, p. 85). In this thesis, two variables from the SCCT will be tested. Social support and self-efficacy, namely, are going to further be researched and studied within this thesis, in the context of STEM careers, gender (a social barrier within STEM), and supplementary academic measures, and their influence on choice. In this way, this thesis will add to existing literature on the SCCT, with narrow focus on key variables influencing the lives of college students, beyond their own interest. This thesis will present support for the argument that interest is not the only deciding factor when an individual chooses his or her own major or career.

### **Social Support**

The ways in which we are perceived by others has profound impacts on our lives. Often, in order to foster our confidence and complete difficult tasks, our self-efficacy comes from support and interaction with others (e.g., Vygotsky, 1978). Our social lives intersect with our personal and professional lives. Having support is important in order to be successful. When we are supported, we have other people that we can confide in, who can give us advice, and who can encourage us to do our best and give us a place of belonging (e.g., Maslow, 1943). It is also important to relate to other individuals who are in similar classes or work environments as we

are. When we have questions or are stuck, it is important to have someone to turn to who has been in your shoes before. Social support supplies us with many tools we need to succeed, as well as help us to overcome social barriers (Lent et al., 2005).

With what I have explored in this thesis thus far, we know that social support within careers matters. We know that potentially, social support may be the difference between someone pursuing their career or not, and staying within their job or not. When we do not have these support systems in place, and when we do not feel as though we have other people who are important to us cheering us on, it is easy to falter and lose our way. It is easy to not be motivated to work hard or to reach for our dreams, and to be discouraged by the words and actions of others based on our identities. For this thesis, I am going to focus specifically on social support within college. Specifically, family support, faculty support, and peer support.

Families and peers can be a strong source of social support. Dennis et al. (2005) investigated how support from parents and peers impacted the academic performance “of 100 ethnic minority first-generation college students” (p. 223). They found that “needed support” (p. 233) from students’ families and their peers was “high[ly] correlat[ed] with [...] college outcomes” (p. 233). In this study, college outcomes are considered to be college GPA, as well as adjustment and commitment to college (p. 225). This need shows us the important role that families and peers play in our academic lives, a time that is especially stressful, in order to encourage us to continue moving forward.

Many college students are just learning how to be independent. With this independence comes interaction with new people who are not part of their family. Whether college students live on campus or not, they interact primarily with other individuals within the college community. College students spend much of their time among faculty and peers. College faculty

provide important feedback and guidance as college students begin their studies and their careers, while peers offer valuable encouragement and allow college students to relax as well. Faculty and fellow peers play important roles in the lives of students.

Faculty support is valuable, as faculty act as mentors to students. Faculty members can offer academic and career advice, as well as feedback, giving students confidence that they need in order to succeed. Schenkenfelder et al (2019) examined the correlation between faculty support and various academic major variables (volitional autonomy, perceived competence, and relatedness). They found that “faculty [...] support [is] related to academic major satisfaction” (p. 7). An additional study, Kendricks et al. (2013), found that within “undergraduate STEM majors in a Midwestern HBCU” (p. 42), after being mentored by faculty or family, “students perceived that mentoring was the biggest contributing factor to their academic success” (p. 42). These are both key findings that show the importance of faculty mentorship for undergraduate students. Faculty help to create student satisfaction, as well as student success.

Again, we know that with the SCCT, social support seems to be correlated with choice, as well as other variables that are part of the SCCT web. Social support is an important things to have access to as a college student, and likewise within our careers. Social support is correlated with many variables, and according to the SCCT, one of these variables is self-efficacy.

### **Self-Efficacy**

Self-efficacy refers to an individual’s personal confidence, as I have briefly touched on previously, “that he or she can master a specific task or topic” (Bandura, 1994; Fallan & Opstad, 2016, p. 33). Self-efficacy is a helpful tool in order to increase the likelihood that one will succeed in multiple areas of life. Having confidence that we have the potential to succeed often allows us to succeed, through mechanisms such as the self-fulfilling prophecy (e.g., Merton,

1936; Rosenthal & Jacobson, 1968). If we fail to have the confidence within ourselves that we can get good grades, finish a project, get a new job, learn how to drive a car, etc., then we hinder our ability to succeed and actually do those things. As seen with the SCCT, self-efficacy and social support are correlated with one another. For example, without advisors to help push us in the thesis process, theses would likely never be completed as undergraduates would quickly lose heart.

Our amount of self-efficacy can come from several different places. Social support may have a direct impact on self-efficacy and academic achievement. For example, Coffman and Gilligan (2002) found that individuals who felt supported “also reported higher satisfaction with life” (p. 62). With this satisfaction may come encouragement. Having social support means having “a sense of belief in” (Chelberg & Bosman, 2020, p. 1) yourself, and Chelberg and Bosman (2020) support this with their student on American Indian (or Native American) students, who gained confidence after completing a mentoring program.

Self-efficacy is an important tool to have in life. Komarraju and Nadler (2013) found that undergraduate students who had “high self-efficacy [...] pursued mastery goals involving challenge and gaining new knowledge as well as performance goals involving good grades and outperforming others” (p. 67). When we have the confidence to do something, and the social support to back us up, we are more willing to shoot for the moon and push ourselves to achieve success. Levels of self-efficacy change with social support, and, as put forth by the SCCT, self-efficacy can change major choice. Self-efficacy impacts our confidence, and what we decide that we can pursue.

## **Academic and Intellectual Development**

### **Theories of Development**

Who we become in our adult lives is also largely due to how we develop. This includes a complex and dynamic interaction among multi-levels of development such as our genetics, our experiences, our societal circumstances, and our culture. These interactions ultimately influence the likelihood of certain lifestyle and career choices, as well as how academically successful we are. Many theories in psychology address the development of the individual, considering and emphasizing the importance and value of the social interactions and relationships on development. For example, Vygotsky's socio-cultural theory of development, Maslow's hierarchy of needs, Judith Rich Harris's theories, and multiple theories of gender-role development highlight the critical role of one's social experiences in individual development.

**Vygotsky's Sociocultural Theory of Development.** Lev Vygotsky (1978) emphasized that children do not develop alone but that they are constantly within the presence and within the context of other people – generally their caretakers, who are older and more knowledgeable. Children learn about the world and gain knowledge through these interactions – in the most advantageous situations, caretakers thoughtfully scaffold and encourage the learning of new knowledge that is just beyond the reach of the child alone. Building upon simple knowledge allows students to be able to fully understand larger concepts (Edens & Shields, 2015). Students are developing throughout school, and it is important that students gain the understanding necessary to succeed beyond GPA.

**Maslow's Hierarchy of Needs.** Another popular theory of development comes from Abraham Maslow. Maslow created the infamous Maslow's Hierarchy of Needs (1943), which details the building blocks every human being needs in order to achieve the ultimate goal of self-

actualization. The levels of need begin with the basic, physiological needs, the progress to safety and security needs, then to belongingness needs, then to esteem needs, and finally to the goal of self-actualization.

Goodrich (2012) applied Maslow's Hierarchy of Needs to qualitative data from college students. The author goes through Maslow's established hierarchy of needs from his theory and applies it to transsexual students based on their responses. Transsexual students identified their needs, and what emerged was the ability to organize a hierarchy of needs that was unique to them. Generally, "lower order (physiological and survival) needs had to be addressed and satisfied before persons could address their higher order needs (esteem and self-actualization in Maslow's theory [...])" (p. 224). If you are part of a marginalized group, several people every day will try to damage your identity and threaten your safety – solely based on that identity. It is especially important that they feel safe, secure, and supported.

It is important to feel a sense of belongingness, and that value is present with the gender disparities within STEM. It is difficult to stay within a place where you do not feel as though you belong, and on college campuses, everyone must have a place of belonging, as Goodrich (2012) explains that "participants needed to feel comfortable in their own bodies [...] before higher education could be a reality for them" (p. 225). Belongingness and social support are invaluable to all students' lives, though for some it may be more difficult to achieve these feelings of belongingness.

Judith Rich Harris (1998) argues that peers are more important than parents in child/adolescent development. This may be transferred into the college world, and peer support may have a large impact on our lives in the formative college years. This supports our previous thoughts surrounding the investigation of peer support in this thesis. The function of peers in

college is a valuable one. Often, we live with our peers rather than our parents in college. Peer support is a key variable to study in the lives of undergraduate college students.

Resiliency (see Zimmerman, 2013) is an important tool to have in life, and is especially important in college. In college there are many challenges and things will not always go smoothly, so it is important to be resilient. It is easier to be resilient when you feel supported and accepted by others, especially when this support and acceptance does not rely on whether or not you fail a class or a test. Overall, development is an important part of an undergraduate's experiences. With all of this in mind, this study will look at academic and intellectual development (Pascarella & Terenzini, 1980), as well as GPA, explained later.

The purpose of this thesis is to explore the college experience, college self-efficacy, and the development of students as it may relate to their gender identity, with a specific interest in investigating perceptions of social support, individual differences in personality, and comparing the experiences of the STEM and non-STEM students, as well as the experiences that originate from other social identity variables. The purpose of this thesis project is to explore some of the underlying factors that might increase the likelihood of a student choosing a STEM major over another major, as well as increase the likelihood of persistence (Hughes, 2018) and success in that STEM major, and examine the impacts of social support on self-efficacy and academic development. In the following section, I will explain and explore social identity factors further.

### **Social Identity**

Social identity influences our interactions. Social identity is typically based on things that are outside of our control. Social identities may include, for example, gender, race, sexuality, ethnicity, age, disabilities, and more. Our social identity influences how other people see us, and how they treat us. Our social identity influences our experiences in our life. Because of social

identity, some individuals do not get the same opportunities that other individuals get. For example, some individuals will not take women seriously and women are prevented from applying and getting jobs that may typically be seen as reserved for men. This glass ceiling impacts women (and quite possibly LGBTQ+ individuals) every day. As previously stated, women may be prevented from having a sense of belonging within their STEM careers, something valuable to their livelihood and development. While all pieces of our social identities impact our experiences and influence our attitudes, there are a few pieces of social identity that are commonly looked at closely that the present study focuses on. These are gender, first-generation student status, and, for the purposes of this thesis, personality.

### **Gender**

Gender is an important demographic that is typically measured in all studies. Asking about an individual's gender can tell us a bit about the difference in the experiences that women and men may generally have. Gender is a valuable tool in this sense, as we are able to become more aware of the ways in which gender impacts us. Because there is such a large gender disparity within the STEM field, gender is especially important to measure in the present study. Traditionally, gender is very simple to measure. Placing a question at the beginning or the end of a study in which the participant checks a "female" box or a "male" box is easily done. Gender is always interesting to analyze and, traditionally, a simple addition to analysis with the rest of the collected data as well. But with more research and knowledge on gender, this simple to measure and easy to ask question is, as it should, becoming more intricate (see American Psychological Association, 2014; Fraser, 2018).

Using the Genderbread Person image from Killermann (2017), I will take a moment to discuss gender. Gender identity is separate from biological sex, which is separate from sexual



orientation. Each of these concepts combine to create one individual's gender expression. All aspects related to gender are on continuums. Gender reaches beyond the traditional male or female dichotomy that it seems is still our society's default. Gender identity is how much of a "woman" or a "man" a person identifies as. Someone may identify as a woman, others may identify as a man, others may identify as non-binary, others may identify as gender queer, and so on. Biological sex refers to a person's physical characteristics, both internal and external. Biological sex only refers to a person's physical anatomy. Not everyone has only female or only male sex organs. According to Planned Parenthood (n.d.), there are approximately "1-2 in 100 people born in the U.S. [that] are intersex." Others are born with female anatomy only, while others are born with male anatomy only.

Sexual orientation refers to who an individual is attracted to. Some individuals are not attracted to anyone. But sexual orientation refers generally to how attracted a person is to men, masculine, or male individuals, and/or women, feminine, or female individuals. Gender expression refers to how masculine and how feminine a person identifies as, and how they present themselves to the world (Killermann, 2017). Often, the sex we are assigned at birth is pervasive throughout our gender identity, and many identify their gender identity with their sex. Many identify their gender expression "in line" with their sex as well (female people are feminine, and male people are masculine).

Based on our sex, typically throughout our lives we are socialized and shaped to fit "in line" or to "match" what is perceived as normal for that sex. This is the social construction of gender or gender role development (e.g., Beal, 1993; Zosuls et al., 2011), as we each are socialized in different ways based only on the randomness of our physical anatomy. This impacts everyone. An example of an agent of socialization, things which direct our social identities, is

toys. Females are traditionally given toys that promote caretaking or cooking. Females receive dolls and play strollers or play kitchens with plastic food. Females are given pink toys and clothing. This directs them into becoming what is considered to be feminine, what is considered to match their sex, so that they develop into what is socially accepted to be a woman, who caretakes and cooks.

Males, on the other hand, are traditionally given toys that promote building or certain careers. Males receive Legos or firetrucks and play doctor's equipment. Males are given blue toys and clothing. If a male were to receive a doll, this act would be looked down upon. Males are directed into becoming masculine, what is considered to match their sex, so that they develop into socially acceptable men. These disparities and differences in gender begin at a young age, and we are each taught, through socialization, about the proper gender roles that we are expected to assume based only on our physical anatomy. For individuals who are intersex, as well as individuals who feel uncomfortable with this societal force, their identity is placed in question as they are forced to choose one side or the other; masculine or feminine, man or woman. But gender is not black and white.

Because gender is so nuanced, it is important to try to measure aspects of it beyond the traditional dichotomous male and female genders. If we do not, we easily overlook experiences of our participants, specifically those who identify as transgender or gender non-conforming (see Fraser, 2018). Gender is an important aspect to everyone's identity, and inherently influences us every day. Measuring gender identity, sex, and gender expression as three separate things will allow us to see what really impacts an individual's life experiences and how they respond to an experiment or a survey. For example, if a person identifies their gender expression as very masculine but not very feminine, and self-report their sex as female, their life experiences and

therefore responses will vary from a person who identifies as a cisgender male. It is important to measure, as best as possible, the experiences of all participants. Using a traditional dichotomous measure is not sufficient; we miss large pieces of the puzzle.

It is important to keep in mind gender expression, even for individuals who do identify within the traditional male and female genders based on their sex (individuals who are cis gender). As seen with the statistics previously presented, there are great disparities within STEM among differing genders and sexual minority individuals. Women and sexual minority individuals are discriminated against, and lack proper social support. Women make up 75% of specifically health-related STEM jobs. These jobs are ones that require caretaking and interpersonal skills, skills and roles that are more commonly seen as reserved for women. Women are welcomed into these roles and stay within these roles because these roles match their sex, and they have been socialized to fit into these roles over other STEM roles. Others have been socialized to expect them within these roles as well.

Women have interest in STEM jobs, and presence within STEM jobs, but mainly only when the job seems to “match” their expected gender roles. Disparities seem to stem from perceived gender roles, and when a female-presenting and feminine person is within a masculine role, discrimination and lack of support will affect her. This tells us that we must make a point of investigating these gender roles, and their place within major and career choice. The large difference of the presence of women in varying STEM jobs signifies that perceived gender roles have a large impact in the careers that we choose to pursue. It is important to reshape the ways in which we measure and research gender, as it heavily impacts our experiences.

### **First-Generation Status**

Another important piece of social identity among college students, especially regarding social support and self-efficacy, is first-generation status. Speaking as a first-generation student myself, first-generation students assume new roles that can bring a great deal of uncertainty. First-generation students do not have the same knowledge surrounding college and college experiences as individuals who are not first-generation. Individuals who are not first-generation are more likely to have important knowledge about college from their parents, knowing the best ways to study, stay connected with others, stay focused, and see the importance of college first-hand. First-generation students, on the other hand, lack this specialized knowledge, and do not have family members to look to for specific knowledge and support.

McCallen and Johnson (2019) looked at first-generation students in their study. They acknowledge that although first-generation students may be at a “disadvantage due to limitations on social and cultural capital associated with their family’s educational history and with institutional constraints on availability of faculty and student support personnel” (p. 9), it was found that “institutional agents, in particular college faculty, can serve as significant sources of support in students’ college success through the transmission of aspirational, intellectual, emotional, and navigational capital that in turn impact their academic achievement and quality of campus experience” (p. 10). Although first-generation students’ families may not be able to support them in the ways that someone who is not first-generation may be able to, individuals within a university may fill the shoes and meaningfully support first-generation students. Faculty can make up some of the difference, pushing first-generation college students to succeed.

### **Personality**

Because personality influences the ways in which we view the world and the ways in which we act (Fallan & Opstad, 2016; Jung, 1921; McCrae & Costa, 1987), personality is valuable to consider. Personality is an extra force that is impacting us all the time, and originates from biological and social sources. Common personality variables are known by the acronym OCEAN – openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae & Costa, 1987). For this study, we will be measuring extraversion and conscientiousness.

Self-efficacy and personality both relate with academic achievement. In looking at self-efficacy, Fallan and Opstad (2016) were interested in seeing how different students in an economics course interacted with others and performed in the course, and measured self-efficacy and different personality traits in each student. Fallan and Opstad (2016) found that “differences in the composition of personality temperaments may affect the gender – self-efficacy relation” (p. 40), using the Myers-Briggs Type Indicators (MBTI). Personality is an important measure overall, and influences other social identity characteristics of a person and the ways in which we obtain and view our confidence. In addition to extraversion and conscientiousness, this study will examine need for approval.

### ***Extraversion/Introversion***

For this study, in order to look closer at shyness, we will be measuring extraversion – one of the five factors of personality (McCrae & Costa, 1987). Shy individuals often hold less self-confidence and judge themselves more in daily interactions, having less of a positive self-concept (Hauck et al., 1986). Additionally, by definition, introverted or shy individuals may have different sources of social support, different perceptions of social support, as well as different

needs for social support than extraverts. Typically, introverts thrive off of energy they gain from alone time. Extraverts, on the other hand, gain energy from being around other people (Jung, 1921). Due to these facts, extraversion levels are important to examine when keeping the variable social support in mind.

### *Conscientiousness*

Individuals who are conscientious, another one of the five-factor structure of personality (McCrae & Costa, 1987), tend to be structured, organized, and detail-oriented individuals. Conscientious individuals typically perform better in school, receiving higher GPAs than those who are not as conscientious (e.g., Kertechian, 2018). Because this study is examining school performance, it is important to keep in mind conscientiousness. Regardless of social support, some individuals may simply perform better than others due to their conscientiousness levels.

### *Need for Approval*

Though social support is an important aspect of all college student's experiences, it may be more important to some college students than it is to other college students. Many college students come to college and are already independent, or can easily adjust to become independent. How much a college student is already or will easily become independent during their college careers is likely based on several different things.

Need for approval has the potential to impact how a person views social support. Some individuals may not have a great need for approval from others (Hewitt et al., 2003), and may not value mentors in the same way that others do. Some individuals may be more likely to be dependent on social support than others. I think that generally individuals who fit into roles of what society has created as "acceptable" may be less dependent on others.

With this knowledge of how self-efficacy and social support influence our choices, as well as the importance of gender identity and expression in our lives, with this thesis I wanted to compare the potentially differing value of self-efficacy, as well as family, peer and faculty forms of social support based on gender identity and major. Would family or peer or faculty support be more important for some social identities more than others, in influencing their self-efficacy and development, and possibly their major?

### **Purpose and Hypotheses**

We know that social support, self-efficacy, and academic outcomes are related. Gender expression and identity are also important to keep in mind when examining the experiences of individuals (for example, their social support and need for social support), and how those experiences may be related to our choices. Traditionally, within typical psychological studies, gender assessment is limited to having to choose between the options of male and female. Often, researchers include “other” as an option as well to accommodate those individuals who do not precisely identify within the male and female categories, although there are shortcomings with this measurement technique. In my thesis, I propose that gender roles, examined through both expression and identity, are important to consider, especially when considering variables such as self-efficacy, social support, and why some individuals choose to go into STEM and others do not. Clearly, there must be important and complex relationships among these variables based on the observation that many STEM women work within a health-related job, and not engineering or computer jobs.

This study examined if there are important associations that can be discovered by using measures of masculinity and femininity that would not be captured by traditional male-female categories of gender. These scales of masculinity and femininity really pick up the general patterns of behavior and tendencies of the individual and they are informed by learning and socialization and needs for agency and affiliation. I feel that it is more important and would be more conceptually and perhaps statistically valuable to consider these richer and dynamic aspects of the person as opposed to dichotomous categories of male-female classification.

The present study also was conducted in order to examine another variable that undeniably is important to the success of individuals and especially college students and a



variable that may be differentially related to students based on their social identities such as gender identities and tendencies toward expression. Specifically, I examined the extent to which perceived social support is a factor in predicting college self-efficacy, and the extent to which this college self-efficacy is a factor in predicting academic outcomes (performance measures), including major choice, as well as to specifically compare the predictive value of peer versus faculty support. The present study also examined how the possible relationship between social support and academic outcomes is moderated by social identity. The principal potentially moderating social identity variable of interest is gender, specifically gender identity (e.g., man, woman, etc.) and how it compares to gender expression (e.g., masculine, feminine, neutral, etc.), to show that gender measured in a dichotomous way is not sufficient. The primary research questions (notated by RQ<sub>x</sub>) that drove this study were:

RQ<sub>1</sub>: How does social support, specifically peer, faculty, and family support, correlate with self-efficacy, and how does self-efficacy correlate with academic and intellectual development?

RQ<sub>2</sub>: How are these relationships moderated by gender identity, gender expression, and major? Specifically, does examining different aspects of gender make a meaningful difference in these associations?

RQ<sub>3</sub>: Does peer support have more of a predictive value than faculty support and family support? Are these associations moderated by social identity?

RQ<sub>4</sub>: Finally, how well do social support, self-efficacy, and gender predict one's major choice?

Thus, the goal of the present study was to be able to better understand the factors that are associated with choice and success in academic settings. The present study will contribute to

existing research regarding what variables are associated with certain students achieving at a higher level than other students. The present study also investigated the factors that are associated with major choice, such as social support, self-efficacy, and gender roles. Wishing to learn more about what variables are associated with people's choices that they do make, the present study will supply more knowledge that will help all individuals be thoughtful and intentional about their choices and successful in their lives. By being able to identify what we are in control of in our lives and bringing awareness to external forces, we will be able to take control of and change our lives. By identifying what role others play in our lives, as well as the roles that we fulfill, we will be able to ensure that all individuals have the support that they need in order to succeed. The present study will contribute to existing research by providing more information to the gender spectrum that is still unfamiliar to many psychology researchers. Further, the present study aims to show that in psychological research (as in other disciplines) it is currently valid and necessary to measure a gender spectrum and various gender variables as opposed to a dichotomy, and it steadily becoming more important.

### **Hypotheses**

There are several different possible meaningful interactions between the variables of interest within the present study. Though, there are few that are especially crucial to examine. For the purposes of these hypotheses, "good academic outcomes" are considered to be the participant's perception of their own academic and intellectual development. Based on a review of the literature, the following research hypotheses were offered to address the research questions.

H<sub>1</sub>: Perceptions of social support by faculty, peers, and family will have a strong, positive correlation with academic perceptions, such as college self-efficacy, and outcomes, such as GPA and perceived academic/intellectual development.

H<sub>2</sub>: Peer, faculty, and family support combined will have a strong, positive predictive relationship with academic perceptions and outcomes.

H<sub>3</sub>: Social identity (I.e., gender, first-generation status, and major) will be a moderator for the association between social support, self-efficacy, and academic outcomes. Specifically, individuals in majority identity groups (such as non-first-generation student status and male gender identity) may be less likely to show a strong, positive correlation in social support and academic outcomes; essentially, academic social support will matter less. Likewise, individuals in minority groups (such as females and first-generation status) may be more likely to have a strong, positive correlation in social support and academic outcomes; essentially, social support will matter more. Individuals may not receive social support due to their roles, however those who do will have better academic outcomes. I also will explore major (STEM versus non-STEM) as a moderating factor for these associations between social support, self-efficacy, and academic outcomes. Individuals may not receive social support due to their roles, however

H<sub>3-1</sub>: The self-efficacy of students within STEM fields will be more highly correlated with their academic and intellectual development than for non-STEM students.

H<sub>3-2</sub>: Individuals within STEM will have higher self-efficacy and more positive AID than those who are non-STEM majors.

We also will explore the results of the BSRI as a moderating factor for these associations.

H<sub>4</sub>: The importance of social support will have more or less importance based on a participant's characteristics. Individuals who are more feminine and are STEM majors will be

more likely to have a strong, positive correlation in social support and academic outcomes than individuals who are more masculine STEM majors.

H<sub>4-1</sub>: Masculine individuals who are *not* STEM majors will be more likely to have a strong, positive correlation in social support and academic outcomes than individuals who are more feminine and are also not STEM majors.

H<sub>5</sub>: Overall, the BSRI will be able to show stronger correlations with social support, self-efficacy, and academic outcomes than the self-report gender identity measure. Further, associations among social support and self-efficacy will be weak when self-reported gender is used as a moderating factor.

H<sub>6</sub>: Faculty support will have a stronger predictive value with academic outcomes than peer support or family support. This will be especially true for individuals who are minority students (importance of having a mentor). Furthermore, faculty support will have a stronger correlation with major choice.

H<sub>7</sub>: Self-efficacy and academic and intellectual development will be strongly correlated.

View Table 1, summarizing these 10 main hypotheses. This figure will be shown again in the discussion section of this paper for your reference.

**Table 1**

*A Summary of the Primary Hypotheses of this Thesis.*

H <sub>x</sub>	Variable 1	Predicted Relationship (PR)	Other variable(s)	Other Notes
H <sub>1</sub>	Overall social support	+	College self-efficacy; academic outcomes (AID)	A series of Pearson correlations; generation of correlation matrix
H <sub>2</sub>	Value of individual and combined social support as predictors of	+	College- self-efficacy; AID	Multiple regression analyses
H <sub>3</sub>	Social identity (gender, 1 <sup>st</sup> gen, major)	Moderating the above pathway model	Social support (SS), self-efficacy (SE), & academic outcomes (AO)	
H <sub>3-1</sub>	STEM student self-efficacy	+	Academic & intellectual development (AID)	This relationship will be stronger for STEM students than non-STEM students.
H <sub>3-2</sub>	STEM students	More positive	Self-efficacy; AID than non-STEM students.	
H <sub>4</sub>	Social support	+	Academic outcomes	More likely if the participant is feminine & a STEM major
H <sub>4-1</sub>	Social support	+	Academic outcomes	More likely if the participant is masculine & not a STEM major
H <sub>5</sub>	BSRI	+	SS, SE, & AO	Stronger correlation than with self-reported gender in place of the BSRI.
H <sub>6</sub>	Faculty support	+	Academic outcomes	Faculty will be more strongly correlated with AO than peers or family.
H <sub>7</sub>	Self-efficacy	+	AID	

As several personality variables were included in the original proposal of this study, personality data were collected. Preliminary analyses show some interesting associations

between personality, gender, and academic outcomes. For example, students who reported higher levels of introversion demonstrated lower levels of social support and reported lower levels of academic and intellectual development. However, the analyses including personality factors will not be reported within this manuscript. Further, first-generation status was included in the data collection of this study. Preliminary analyses show some interesting associations with first-generation status as a moderator for the associations between social support, self-efficacy, and academic outcomes. For example, with students who were first-generation tend to perceive less support from family than those who are not first-generation. There are some analyses of first-generation status reported in the results section of this study, however the effects of first-generation status are limited and are not the focus of the preliminary results presented, and will not be largely discussed.

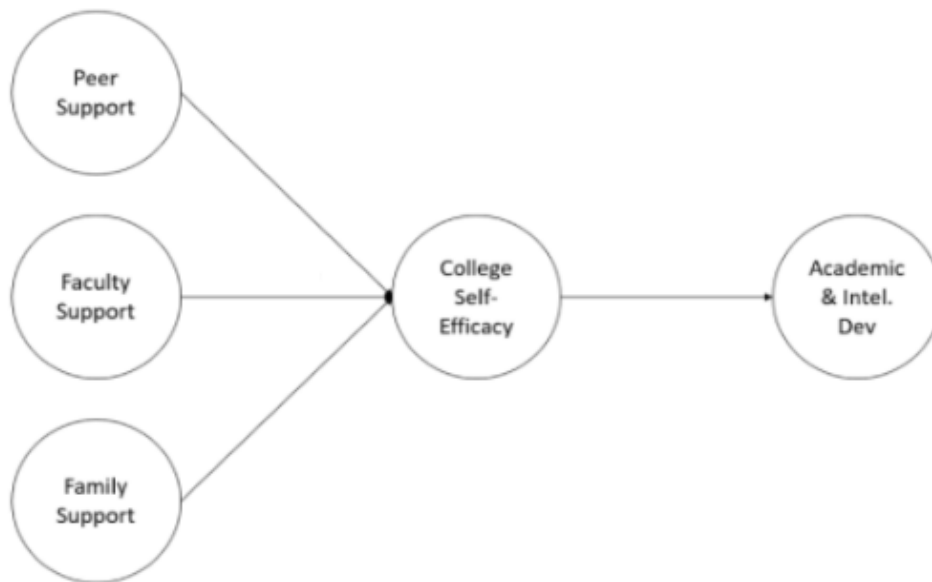
### **Moderation Model**

As I was interested in the associations between social support, self-efficacy, and academic and intellectual development, there were several different variables that had the potential to moderate these associations in several different ways. The primary hypothesis of the present study is that gender (I.e., identity versus expression) and major are moderators for these potential predictive relationships between social support, self-efficacy, and academic and intellectual development. Further, gender identity is predicted to change the strength and direction of the predictive correlation between social support and academic outcomes as operationally defined by student perceptions of academic and intellectual development. The potential predictive value that social support has on academic outcomes may change due partially to gender identity. See Figure 1 below. This model will be tested using the responses of participants, and the moderating impacts of various social identity variables on this model will be

investigated as well (I.e., how this model changes for individuals of certain genders, first-generation status, and so on).

### Figure 1

*An Illustration of the Model to Test*



## Method

### Participants

In order to gather data for this thesis, a Google Forms survey was open from January 31<sup>st</sup>, 2020 through March 16<sup>th</sup>, 2020. There was a total of 223 undergraduate students, with an average overall GPA of 3.42 and an average major GPA of 3.47, who completed the survey during that time. Of those 223, 108 reported if they attend Bellarmine University or not, with 101 undergraduate students reporting that they do attend Bellarmine and are Bellarmine students, and 7 reporting that they do not attend Bellarmine University and are not Bellarmine students. This was a question later added in, when the study moved from Bellarmine to include other students;

we can assume that anyone who completed the survey before this question was added is a Bellarmine student. 115 participants completed this survey prior to the addition of this question, so we know that a total of 216 participants are Bellarmine students. The other 7 students likely attend either the Jefferson Community and Technical College or the University of Louisville, both of which are in the city of Louisville, or the University of Kentucky, in the city of Lexington, KY.

Of these total 223 undergraduate participants, who each self-identified their gender, 173 were female-identifying (77.6%), 40 were male-identifying (17.9%), and 10 identified themselves as non-binary or another variation classified, for the purposes of this study, as “other” (4.5%; variations include agender, gender fluid, gender queer, and queer woman). The majority of participants were measured to be more feminine than masculine (with the BSRI) as well. Additionally, participants were asked to self-identify their race and ethnicity. Of the 218 who self-reported their race, the majority (188 individuals, 86.3% of the 218) identified their race as white, Caucasian, or a white American. Of the 202 who self-reported their ethnicity, 97 (48% of the 202) individuals identified their ethnicity as white, Caucasian, or white American. Further responses to race and ethnicity were widely varied, as participants identified themselves as African American, African, Asian, Asian American, biracial, Hispanic, non-Hispanic, American, North American, Black, Brown, and several various other identifications, including German-Italian, English, Croatian, and Jewish.

The majority of participants, 150 of them (67.3%), are not first-generation students, and the majority of all participants, 145 of them (65%), lived on campus at the time of this survey or lived on campus at some point prior to the survey. Seventy-four participants (33.2%) have a parent/guardian who has a Bachelor’s degree, and 64 participants (28.7%) have a parent/guardian



who attended college in some capacity, though they did not receive a Bachelor's degree. Further, 21 of this 64 (9.4% of the total number of participants) have a parent/guardian who have an Associate's degree. 42 participants (18.8%) have a parent/guardian with a Master's degree, and 17 participants (7.6%) have a parent/guardian who has a Doctorate degree. Only 5 participants (2.2%) have a parent/guardian who have a Professional School Degree, and 3 participants (1.3%) have a parent/guardian whose education is less than 12<sup>th</sup> grade. The remaining 18 (8.1%) have parents/guardians who have a high school diploma as their highest level of education. Regarding the income earned by parents/guardians, 2 participants omitted this question. Seventy-six participants (34.4% of the 221) have parents/guardians that earn over \$100,000, with the remaining 145 participants reporting that their parents/guardians make less than this. The majority of these 145 participants (21.1% of the 221) have parents/guardians who make between \$50,000 and \$74,999 a year.

Again, this study was limited to only undergraduate students. With regard to year in school, 56 were first year students, 71 were sophomores, 53 were juniors, and 43 were seniors (with 1 individual possibly being a 5<sup>th</sup> year master's student). When asked to report current major(s) and minor(s), 20 participants did not leave a response. The majority of the remaining undergraduates, 143 of the 203 (70.4%), major in a non-STEM subject. Majors that were considered to be non-STEM were psychology, criminal justice, art, English, education (including learning behavior disorders), music, languages, theology, sports administration, pre-law, political science, history, public health, philosophy, communications, design art and technology (DAT) major, liberal arts, foreign languages and international studies (FLIS) major, the African and African American diaspora studies minor, business administration, and architecture.

Fifty participants reported that they major in a STEM subject. Majors that were considered to be STEM responses were biology, nursing, exercise science, biochemistry and molecular biology (BMB) major, biochemistry, environmental science, computer engineering, computer science, math, actuarial science, economics, pre-med, and accounting. Note that these are the responses that were received using this survey, and that there may be more subjects that can be considered non-STEM or STEM within Universities. Any individuals who are double majoring in two subjects that are both non-STEM or both STEM were coded in with either the non-STEM or the STEM majors. Nine participants were viewed as having a combination of non-STEM and STEM, either as double majors, or a major and a minor. One individual reported that they were majoring in MAT Elementary Education and MAT Learning Behavior Disorders, and likely identify as an undergraduate senior who is taking advantage of the Bellarmine early access Master's program. No participants were, at the time of completing this survey, undecided in their major. When asked if they had ever changed their major, the majority of participants (128 of them, 57.4%) reported that they had changed their major. When asked about previous majors, of the 96 who responded, the majority (41 participants) previously majored in a STEM major.

There are many variables that function only as descriptor variables, in order for the population to be thoroughly described. Many of these variables were not originally intended to be descriptor variables, though due to timing they remain only as descriptors of the sample population. Students were mainly recruited through email and their professors during the spring 2020 semester. Several of the participants were incentivized with extra credit for completing the survey form, if their professor who referred them to the study was willing and able to offer extra credit. There was no data that was specifically excluded from analysis, although some analyses

were not attempted or completed due to the small numbers of self-reported males and self-reported other gender identities.

### **Measures**

The measures described below, in their survey format, can also be found in Appendix A.

#### ***Social Support***

In order to capture any association between the study variables of interest and social support, social support was measured in a variety of ways including assessments of peer and faculty interactions and family support. First, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) was used. This scale measures the support that the participant feels from friends, family, and significant others. Participants responded to 12 different statements on a scale of 1-7, 1 being “very strongly disagree” and 7 being “very strongly agree”. Sample items from this inventory are: “there is a special person who is around when I am in need” (made to measure support from significant others), “my family really tries to help me” (made to measure support from families), and “I can count on my friends when things go wrong” (made to measure support from friends).

Social support was also measured using the Institutional Integration Scale (IIS) from Pascarella and Terenzini (1980). The IIS consists of 5 subscales: Peer-Group Interactions, Interactions with Faculty, Faculty Concern for Student Development and Teaching, Academic and Intellectual Development, and Institutional and Goal Commitment. Each item on each scale is responded to using a Likert type response, ranging from 1-5, where 1 is “strongly disagree” and 5 is “strongly agree”. The Peer-Group Interaction subscale includes items such as “since coming to this university I have developed close personal relationships with other students,” the Interactions with Faculty subscale includes items such as “my non-classroom interactions with

faculty have had a positive influence on my personal growth, values, and attitudes,” the Faculty Concern for Student Development and Teaching subscale includes items such as “most of the faculty members I have had contact with are interested in helping students grow in more than just academic areas,” the Academic and Intellectual Development subscale includes items such as “I am more likely to attend a cultural event (i.e., concert, lecture, art show) now than I was before coming to this university,” and the Institutional and Goal Commitments subscale includes items such as “I am confident that I made the right decision in choosing to attend this university.”

There is a total of 30 items in the IIS used in the present study.

### ***Academic Outcomes***

Academic outcomes were measured in a variety of ways. This variety of measurement is important to utilize because academic achievement, as well as likelihood of changing major, can be demonstrated in several ways. For this study, academic outcomes were measured with self-reported grade point average (GPA) - overall GPA and major-specific GPA. For this study, student scores on the Academic and Intellectual subscale mentioned above were used as an indication of “academic outcomes”, that is, as an indication of student perceived gains and academic attainment. To elaborate, other items that comprised this scale include: “my interest in ideas and intellectual matters has increased since coming to this university”; “I am satisfied with the extent of my intellectual development since enrolling in this university”; “few of my courses this year have been intellectually stimulating” (reverse-scored); and “I have performed academically as well as I anticipated I would”. This Academic and Intellectual Development (AID) subscale is viewed to be an additional method in evaluating academic performance, beyond numerical measures such as GPA. The AID subscale seems to reflect more meaningful and wholistic learning that letter grades cannot capture.

### *Self-Efficacy*

Using the College Self-Efficacy Inventory (CSEI; Solberg et al., 1993), the study measured each participant's self-efficacy in relation to their status as a student at a university. The CSEI consists of 20 statements of various activities a typical college student will face. Participants responded with how confident they are in their ability to be successful with each activity, such as their ability to "make new friends at college." For each statement, participants reported their confidence level on a Likert type scale, ranging from 1 (not at all confident) to 10 (extremely confident).

### *Social Identity*

Certain aspects of social identity were measured, in order to evaluate their potential moderating impact on the predictive relationship between social support and academic achievement. For this study, different measures of gender were utilized.

**Gender.** In order to measure gender, and analyze the experiences of all participants, participants both self-reported their gender identity by writing in their own responses to the prompt "Please self-report your gender identity," and completed a short form of the Bem Sex Role Inventory (BSRI). Self-reporting of gender identity allows participants the freedom to report how they choose to identify and does not keep them conformed and confined to a few choices. Self-report also avoids the participant feeling "othered" if they are forced to choose an "other" option if they do not fit into the categories that the researcher sets. The BSRI was developed by Sandra Bem (1974) and is used to help identify an individual's gender expression. The inventory used in the present study consisted of 20 items and was presented to participants as a demographic assessment, from Bem (1981; as cited by Choi et al., 2009; Stoet, 2019). In the BSRI, each item is an adjective, and participants are instructed to rate themselves on each item.

Ten items are considered to be feminine characteristics, such as “understanding” and “sympathetic,” while 10 items are considered to be masculine characteristics, such as “assertive” and “dominant.” There are 10 neutral items as well (Bem 1981; as cited by Choi et al., 2009), though neutral items were not used in the present study. The participants rated themselves on how true each characteristic is for themselves on a scale from 1-7, 1 being “almost never true”, 7 being “almost always true”, and 4 being “neutral”. The responses on these items created a score for each participant, showing how feminine and masculine they are or are not in their gender expression; an individual can have high femininity and high masculinity, high femininity and low masculinity, low femininity and high masculinity, or low femininity and low masculinity.

**Demographics.** There were several variables that were measured in order to learn more about the demographics of the present study’s population, as well as to examine independently if we chose to. These demographics include GPA, current major and persistence in major, race and ethnicity, first-generation status, residential status, family education level, family income level, and school year. Additionally, some participants were asked if they attended Bellarmine University.

**GPA.** GPA is an important aspect of measuring academic achievement in the university environment. In order to measure GPA, participants were asked to self-report their current overall GPA and their current major GPA (consisting of grades from classes that the participant completed as a requirement for their current chosen major), both on a 4-point scale.

**Current Major & Persistence in Major.** In order to observe how potentially likely a participant is to change their major, and to potentially learn why participants chose their major, direct questions were asked about current and past majors, as well as potential future change of major. Participants self-reported their current major and reported if they had changed their major

in the past. In order to see the differences among STEM and non-STEM majors, again the following majors were considered to be STEM majors: biology, nursing, exercise science, biochemistry and molecular biology (BMB) major, biochemistry, environmental science, computer engineering, computer science, math, actuarial science, economics, pre-med, and accounting.

***Race & Ethnicity.*** Participants self-reported their race and ethnicity; participants wrote in their own race and ethnicity. As with gender identification, this method was used to ensure that no participant felt “othered”. This method was also used to ensure that all participants were able to report their race and ethnicity without being limited to set categories.

***First-Generation Status.*** Participants were asked whether they are a first-generation college student or not. For the purposes of this study, first-generation students are students that have no parent that graduated from a 4-year college or university. This disregards grandparents and siblings of the participant who may have a 4-year degree.

***Residential Status.*** In order to see the differences in students based on where they currently live or have lived, participants were asked to select “yes” or “no” to the question “do you live on campus, or have you ever lived on campus?”

***Estimate of Socioeconomic Status (SES).*** Two pieces of information were collected to estimate the SES of the student sample: Family education level and family income. It is widely known that the education level that our parents have influences our knowledge and preparation for college (e.g., Mayhew et al., 2016; Pascarella & Terenzini, 1983). Participants were prompted to choose one of four options describing the “highest level of education represented in your household by your parents/guardians”. Options were: “Less than 12<sup>th</sup> grade”, “High school graduate or the equivalent”, “Some college credit, less than 1 year”, “1 or more years of college”,

“Associate’s Degree”, “Bachelor’s degree”, “Master’s degree”, “Doctorate Degree”, and “Professional School Degree.”

Further, because we know that the ability to pay for college is a large indicator or whether or not a young adult chooses to attend college (e.g., Mayhew et al., 2016; Pascarella & Terenzini, 1983), participants were prompted to select the range in which their parents/guardians approximate total income earned would fall. The prompt presented to participants was, within a section titled “Demographics,” “The approximate total income of your household earned by your parents/guardians:” with the choices of “Less than \$20,000”, “\$20,000 to \$34,999”, “\$35,000 to \$49,999”, “\$50,000 to \$74,999”, “\$75,000 to \$99,999”, and “Over \$100,000”. Participants were not prompted to write in their own answers for this question.

***School Year.*** In order to see any variation from one class to the next, participants were asked the year that they are currently in. Students had to choose one of four multiple choice answers: first-year, sophomore, junior, or senior. Although we did not incorporate this, it would do well to instruct participants to report their school year based on hours. This would ensure clarity.

***Personality.*** In order to look more closely at the impact that personality has on social support and academic outcomes, the personality variables need for approval, introversion, and conscientiousness were examined.

***Need for Approval.*** Need for approval was measured using items adapted from the International Personality Item Pool (IPIP; [www.ipip.ori.org](http://www.ipip.ori.org)). Conformity (Jackson Personality Inventory-Revised (Jackson 1994): Cooperativeness) and dependence (Temperament and Character Inventory; Cloninger et al., 1994) items were combined and included to gauge an individual’s need for approval, selected simply by viewing the items and selecting what seemed



to fit best on the IPIP website. Participants were instructed to indicate for each statement whether it was 1. very inaccurate, 2. moderately inaccurate, 3. neither accurate nor inaccurate, 4. moderately accurate, or 5. very accurate as a description of them. Items included statements such as, “I worry about what other people think of me”, “I do what others do” (both of these examples represent conformity), “I try to please everyone”, and “I follow orders” (both of these examples represent dependence).

***Introversion and Conscientiousness.*** Two items from the “Big Five” factors of personality (McCrae & Costa, 1987), introversion and conscientiousness, were included, because these scales are arguably related to the variables of interest in the current study – specifically social support, self-efficacy, and academic outcomes. Both scales were measured using items adapted from the IPIP ([www.ipip.ori.org](http://www.ipip.ori.org)). First, because we know that whether or not one is more introverted or extraverted may impact how socially sensitive they are and have implications for how they receive and perceive social support, it is important to keep in mind this personality factor for each participant. The same instructions were given with these introversion questions as what was given with the need for approval questions. Example items from the Conn and Rieke (1994) scale, used in the present study, include “I want to be left alone” and “I enjoy teamwork.”

Conscientiousness was measured using items adapted from the IPIP as well. Because we know that conscientious individuals already generally perform well academically, it is important to keep the amount of conscientiousness within each participant in mind. Conscientiousness may be able to describe why some students perform well academically, regardless of social support. The same instructions were given with these conscientious questions as what was given with the

need for approval and introversion questions. Example items from Goldberg (1992), the Big-Five Factor III, used in the present study, include “I like order” and “I make a mess of things.”

### **Procedure**

Participants completed these questionnaires online via Google Forms. Before completing the questionnaires, participants were presented with an informed consent. This informed consent included the contact information of the researchers (Dr. Christy Wolfe and Kasey Phelps), should the participant have any questions regarding the study. Participants were then able to respond to all questionnaires, omitting any questions they preferred to keep unanswered. Once the participant completed the study, they were presented with contact information for the Bellarmine University counseling center, encouraging participants who were Bellarmine students to seek free counseling if they should need it. This study was reviewed by Bellarmine’s Institutional Review Board (IRB; view Appendices C and D).

### **Research Design**

The design for this study was quantitative and correlational. The primary variables of interest in the current study were social support (peer, faculty, and family), college self-efficacy, and academic outcomes (i.e., student perceptions of academic and intellectual development). Important demographic variables and variables assessing one’s social identity included gender (identity and expression) and major (STEM or non-STEM). Additional variables that were included but will not be the focus of the analyses and results presented here (largely due to the circumstances surrounding the COVID-19 pandemic) were the personality characteristics of introversion, conscientiousness, and need for approval, as well as other aforementioned variables such as GPA, past majors, grace, ethnicity, first-generation status, and housing status. This correlational study examined the relationships between these variables.

## Results

The major variables of interest in the current study were social support (peer, faculty, and family), college self-efficacy, and academic outcomes (defined by student perceptions of their academic and intellectual development). Overall and major GPA also were assessed. Many analyses were conducted with these GPA variables, but in most cases the associations were weak, and the precision and validity of these data were questionable due to their self-report nature. Students' confidence in making the right choice by choosing Bellarmine also was included, measured with the Institutional and Goal Commitments scale. Due to the timing of the study and of data analysis, coinciding with the coronavirus pandemic, the following results are preliminary only.

Various aspects of students' social identity were measured, including self-reported gender identity and first-generation student status. Additionally, because I was curious about potentially associations between the study variables based on gender, a short-form version of the BSRI measured students' behavioral tendencies to portray traits and characteristics that might be considered "traditionally" characteristic of "males" or "females".

First-generation student status and student major choice (categorized as STEM or non-STEM) were considered aspects of social identity. Certain aspects of personality that were believed to be relevant to the current study variables were included as well: conscientiousness, conformity, and introversion. Finally, as a control item, socioeconomic status (SES) was gauged by responses to survey items asking about highest level of parent education and parental household income.

### **Data Reduction**

The following variables were created based on the scoring instructions available from the scale authors. In all cases, the procedures instructed that negatively keyed items be reverse-scored and then the mean of all items computed. Cronbach's alpha values were computed for each scale and are listed in parentheses following each variable: Peer group interaction (.84), interactions with faculty (.71), academic and intellectual development (.79), college self-efficacy (.91), general social support scale (includes the family support scale; .94), BSRI (masculine; .87), BSRI (feminine; .88), conformity (.81), conscientiousness (.85), and introversion (.85). Inter-item reliability analyses indicated high reliability of each scale. For those variables that initially yielded Cronbach's alpha levels below .70, individual items were inspected and in some cases were removed to improve the reliability of the scale. Specifically, for peer group interaction, the item "most students' values are consistent with my own" was not strongly related to the other items within this scale for this sample, so it was removed. For academic and intellectual development, "few of my courses this year have been intellectually stimulating" was not highly correlated with other items of this scale, so it was removed. For the conformity scale, the item "not concerned with making a good impression" was not strongly related to other items on the conformity scale and was removed to enhance the Cronbach's alpha.

It is important to note that one scale, Institutional and Goal Commitments, yielded low inter-item reliability. However, the individual items of this scale were relevant for the research questions in the current study, so the individual items were retained for analysis (I.e., "I am confident that I chose the right school"; "It is likely that I will register next fall"; and "It is important to graduate from this university."). It also is important to note that two scales, dependence (part of the need for approval personality measure) and Faculty Concern for Student

Development and Teaching, did not yield confident inter-item reliability coefficients. These variables were not included in the subsequent analyses.

### **Descriptive Statistics**

Descriptive statistics, specifically measures of central tendency and dispersion, were calculated for each study variable and are summarized in Table 2 on the next page.

**Table 2***Descriptive Statistics for the Variables of Interest*

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
College Self-Efficacy	223	7.62	1.36
Overall GPA	213	3.42	.48
Major GPA	212	3.47	.50
Peer Group Interaction	223	3.66	.82
Faculty Interaction	223	3.96	.84
Social Support (General)	223	5.75	1.22
Social Support (Sig. Other)	223	5.76	1.53
Social Support (Family)	223	5.63	1.55
Social Support (Friends)	223	5.83	1.37
Academic & Intellectual Dev	223	3.91	.66
Right Decision to Choose BU	222	4.11	1.07
Likely to Register Next Fall	222	4.29	1.23
Important to Graduate from BU	223	4.57	.82
Conformity	223	2.78	.67
Conscientiousness	223	3.75	.68
Introversion	223	3.25	.70
BSRI (masculine)	223	4.82	1.00
BSRI (feminine)	223	5.83	.89

### **Social Identity Group Comparisons on Key Variables**

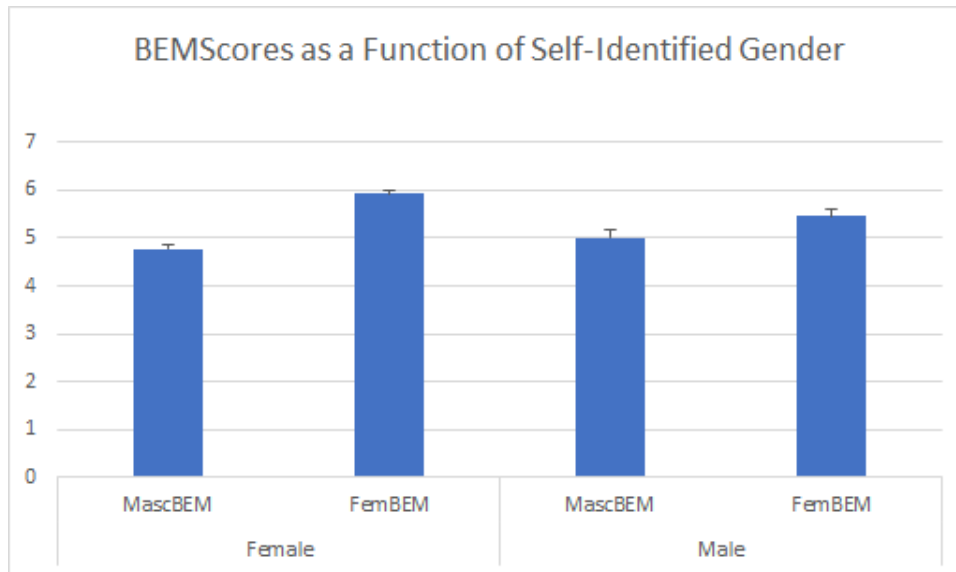
To explore differences between various groups categorized by social identity (e.g., first-generation status, self-identified gender, gender expression, and STEM major status), a series of independent groups *t*-tests were conducted on key variables of interest. Specifically, the dependent variables compared were: Overall GPA, parent education, parent income, faculty support, peer support, family support, academic/intellectual development, and confidence in decision to attend this university. Significant differences were found for some of these variables, depending on the social identity group. These analyses and significant results are summarized below.

**Self-Identified Gender.** A series of independent groups *t*-tests compared the key study variables of interest for students who self-identified as females or males. The only variable that demonstrated a statistically significant difference between males and females was social support from family,  $t(211) = 3.00, p = .003$  (two-tailed), with females ( $M = 5.84, SD = 1.39$ ) reporting higher levels of familial social support than males ( $M = 5.05, SD = 1.91$ ).

**BSRI Scores as a Function of Self-Identified Gender.** A significant difference was found between the two self-identified genders (male versus females) for the BSRI feminine score, with self-identified females reporting higher levels of BSRI femininity. No significant difference was found between the two self-identified genders for the BSRI masculinity scores; self-identified males and females were equivalent on BSRI masculinity. See the figure and tables below. Note that within the figure, and all following figures, the “BEM” abbreviation refers to the BSRI scores.

**Figure 2**

*BRSI Scores as a Function of Self-Identified Gender*



**Table 3**

*A Summary of the Multivariate Analysis of Variance Tests*

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.973	3742.606 <sup>b</sup>	2.000	210.000	.000
	Wilks' Lambda	.027	3742.606 <sup>b</sup>	2.000	210.000	.000
	Hotelling's Trace	35.644	3742.606 <sup>b</sup>	2.000	210.000	.000
	Roy's Largest Root	35.644	3742.606 <sup>b</sup>	2.000	210.000	.000
genderidentity	Pillai's Trace	.056	6.269 <sup>b</sup>	2.000	210.000	.002
	Wilks' Lambda	.944	6.269 <sup>b</sup>	2.000	210.000	.002
	Hotelling's Trace	.060	6.269 <sup>b</sup>	2.000	210.000	.002
	Roy's Largest Root	.060	6.269 <sup>b</sup>	2.000	210.000	.002

a. Design: Intercept + genderidentity

b. Exact statistic



**Table 4**

*A Summary of the Between-Subjects Effects: A Significant Difference for Feminine BRSI Scores*

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	mascBEM	1.718 <sup>a</sup>	1	1.718	1.725	.190
	femBEM	7.375 <sup>b</sup>	1	7.375	9.491	.002
Intercept	mascBEM	3110.302	1	3110.302	3122.949	.000
	femBEM	4197.361	1	4197.361	5401.739	.000
genderidentity	mascBEM	1.718	1	1.718	1.725	.190
	femBEM	7.375	1	7.375	9.491	.002
Error	mascBEM	210.146	211	.996		
	femBEM	163.955	211	.777		
Total	mascBEM	5161.286	213			
	femBEM	7415.877	213			
Corrected Total	mascBEM	211.864	212			
	femBEM	171.330	212			

a. R Squared = .008 (Adjusted R Squared = .003)

b. R Squared = .043 (Adjusted R Squared = .039)

**BSRI-Scored Femininity.** Using the median-split procedure, participant scores on the BSRI scale were divided into “high femininity” and “low femininity” groups (Median = 5.90). A series of independent groups *t*-tests compared the key study variables of interest. In contrast to the minimal differences reported between the self-identified males and females in the previous set of analyses, all variables demonstrated statistically significant differences. Specifically, those with participants with high scores on the BSRI femininity scale report higher levels of faculty support, peer support, family support, college self-efficacy, and academic and intellectual development. In contrast to self-identified gender, the BSRI femininity scores appear to be more valuable in assessing group differences related to the variables of interest in this study (e.g., social support, self-efficacy, and academic and intellectual development). See the tables below.

**Table 5***Descriptive Statistics for the Low and High Feminine BRSI Scores*

<b>Group Statistics</b>					
	femBEMrechHILo	N	Mean	Std. Deviation	Std. Error Mean
InteractionsFaculty	Low Fem BEM	100	3.8180	.86834	.08683
	High Fem BEM	122	4.0738	.81157	.07348
PeerGroupInteraction	Low Fem BEM	100	3.6183	.94735	.09473
	High Fem BEM	122	3.8962	.87913	.07959
SocSuppFAM	Low Fem BEM	100	5.2983	1.55547	.15555
	High Fem BEM	122	5.9016	1.50054	.13585
CollegeSelfEfficacy	Low Fem BEM	100	7.2978	1.33681	.13368
	High Fem BEM	122	7.8818	1.32547	.12000
AcademicIntellDev	Low Fem BEM	100	3.8835	.74526	.07453
	High Fem BEM	122	4.1000	.71962	.06515

**Table 6**

*A Summary of the Independent t-tests Comparing Low and High Feminine BRSI Scores*

		Levene's Test for Equality of Variances		t	df	Sig. (2-tailed)
		F	Sig.			
InteractionsFaculty	Equal variances assumed	.277	.600	-2.264	220	.025
	Equal variances not assumed			-2.249	205.376	.026
PeerGroupInteraction	Equal variances assumed	.773	.380	-2.262	220	.025
	Equal variances not assumed			-2.245	204.659	.026
SocSuppFAM	Equal variances assumed	.375	.541	-2.932	220	.004
	Equal variances not assumed			-2.921	208.417	.004
CollegeSelfEfficacy	Equal variances assumed	.074	.786	-3.254	220	.001
	Equal variances not assumed			-3.251	210.829	.001
AcademicIntellDev	Equal variances assumed	.000	.987	-2.195	220	.029
	Equal variances not assumed			-2.187	208.504	.030

**BSRI-Scored Masculinity.** Again, using the median-split procedure, participants were categorized into “high masculinity” and “low masculinity” groups based on their BSRI masculinity score (Median = 4.9). A series of independent groups *t*-tests was conducted on the study variables of interest. Significant differences were found between the high and low masculinity groups for faculty support, college self-efficacy, and marginally for peer support (but not for family support or academic and intellectual development). In those cases of statistically significant differences, those students with higher scores on masculinity reported higher levels of faculty and peer support and college self-efficacy. See the tables below.

**Table 7**

*Descriptive Statistics for the Low and High Masculine BRSI Scores*

<b>Group Statistics</b>					
	MascBEMrecHIlo	N	Mean	Std. Deviation	Std. Error Mean
InteractionsFaculty	Low Masc BEM	110	3.7891	.83274	.07940
	High Masc BEM	113	4.1204	.82572	.07768
PeerGroupInteraction	Low Masc BEM	110	3.6561	.88948	.08481
	High Masc BEM	113	3.8805	.93368	.08783
SocSuppFAM	Low Masc BEM	110	5.5030	1.51740	.14468
	High Masc BEM	113	5.7566	1.57423	.14809
CollegeSelfEfficacy	Low Masc BEM	110	7.1607	1.20389	.11479
	High Masc BEM	113	8.0631	1.35258	.12724
AcademicIntellDev	Low Masc BEM	110	3.9505	.69304	.06608
	High Masc BEM	113	4.0531	.77507	.07291

**Table 8**

*A Summary of the Independent t-tests Comparing Low and High Masculine BRSI Scores*

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	Sig. (2-tailed)
InteractionsFaculty	Equal variances assumed	.902	.343	-2.983	221	.003
	Equal variances not assumed			-2.982	220.722	.003
PeerGroupInteraction	Equal variances assumed	.203	.653	-1.837	221	.068
	Equal variances not assumed			-1.838	220.898	.067
SocSuppFAM	Equal variances assumed	.120	.730	-1.224	221	.222
	Equal variances not assumed			-1.225	220.979	.222
CollegeSelfEfficacy	Equal variances assumed	.563	.454	-5.258	221	.000
	Equal variances not assumed			-5.266	219.260	.000
AcademicIntellDev	Equal variances assumed	1.354	.246	-1.042	221	.299
	Equal variances not assumed			-1.043	219.432	.298

**First-Generation Status.** Based on the results of a series of independent groups *t*-tests, there was a significant difference between students with a first-generation status and a non-first-generation status for the following variables: GPA, parent education, parent income, and peer group interaction. Differences for academic/intellectual development and family support were marginally significant, with students who were first-generation tending to perceive less support from family ( $p = .056$ ) and less gains in academic/intellectual development ( $p = .052$ ). See Table 9 for a summary of the statistically different group means and *t*-statistics.

**Table 9***First-Generation Status Group Comparisons*

Variable	First-Gen <i>M (SD)</i>	Non-First-Gen <i>M (SD)</i>	<i>df</i>	<i>t</i>	<i>p</i>
GPA	3.23(.53)	3.50(.43)	211	-4.05	<.001
Parent education	3.47(1.13)	6.42(1.13)	221	-17.46	<.001
Parent income	3.59(1.83)	4.75(1.25)	219	-5.46	<.001
Peer support	3.59(1.01)	3.86(.85)	221	-2.02	.045

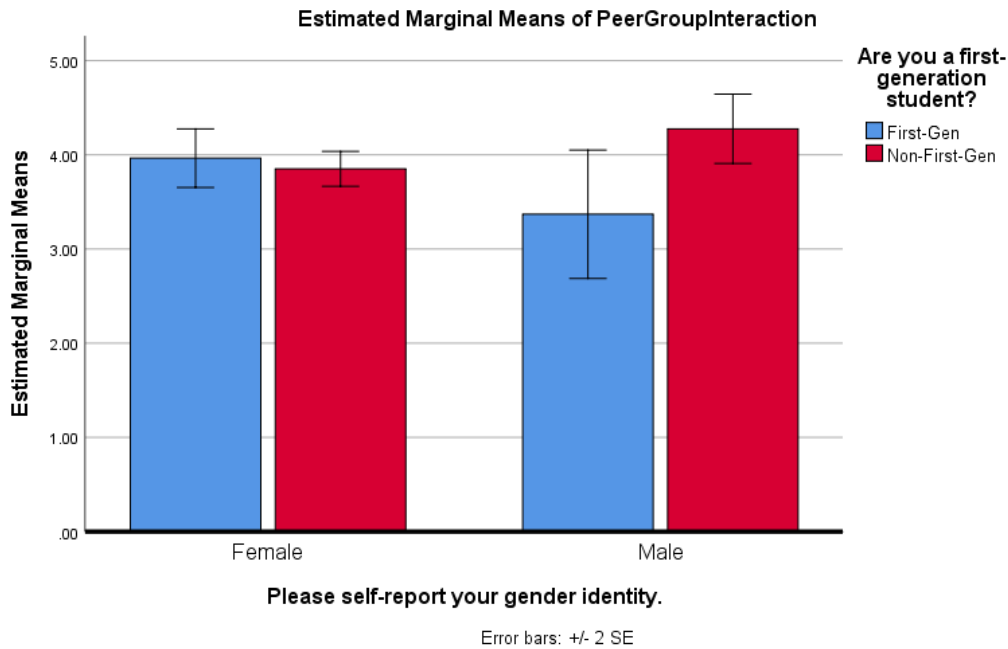
**STEM vs. Non-STEM Majors.** Because I had a special interest in the academic experiences of STEM vs non-STEM students, I explored potential differences in the primary study variables based on major designation. Based on the results of a series of independent groups *t*-tests, significant differences between the STEM and non-STEM majors were found for three of the study variables: GPA, college self-efficacy, and peer support. STEM majors reported higher GPAs,  $t(192) = 2.70$ ,  $p = .007$  (two-tailed; STEM GPA  $M = 3.56$ ,  $SD = .35$ ; non-STEM GPA  $M = 3.37$ ,  $SD = .49$ ). They also reported higher levels of peer support,  $t(200) = 2.97$ ,  $p =$

003 (two-tailed; STEM  $M = 4.04$ ,  $SD = .77$ ; non-STEM  $M = 3.62$ ,  $SD = .95$ ). STEM majors reported higher levels of college self-efficacy,  $t(200) = 2.11$ ,  $p = .036$  (two-tailed; STEM self-efficacy  $M = 7.93$ ,  $SD = 1.07$ ; non-STEM self-efficacy  $M = 7.51$ ,  $SD = 1.37$ ), but equivalent levels of AID,  $t(200) = -1.9$ ,  $p = .847$  (two-tailed; STEM AID  $M = 3.99$ ,  $SD = .60$ ; non-STEM AID  $M = 4.00$ ,  $SD = .77$ ).

**Social Support, Social Identity, and Intersectionality.** To explore the experiences of students who may have multiple marginalized social identities that interact to yield significantly different academic experiences, a multivariate analysis of variance was conducted on the three social support variables with gender identity, first-generation status, and STEM major designation as independent variables. A main effect for gender identity was found,  $F(3,183) = 2.79$ ,  $p = .042$ . A main effect for first-generation status was found,  $F(3,183) = 3.28$ ,  $p = .022$ . These main effects were superseded by a gender identity and first-generation status interaction,  $F(3,183) = 2.70$ ,  $p = .047$ . An inspection of the between subject effects, revealed significant differences for the peer support variable ( $p = .018$ ) and marginally for the family support ( $p = .052$ ). See the figures below for a summary of these effects. In both cases, students who identified as male and as first-generation reported lower levels of peer and familial support.

**Figure 3**

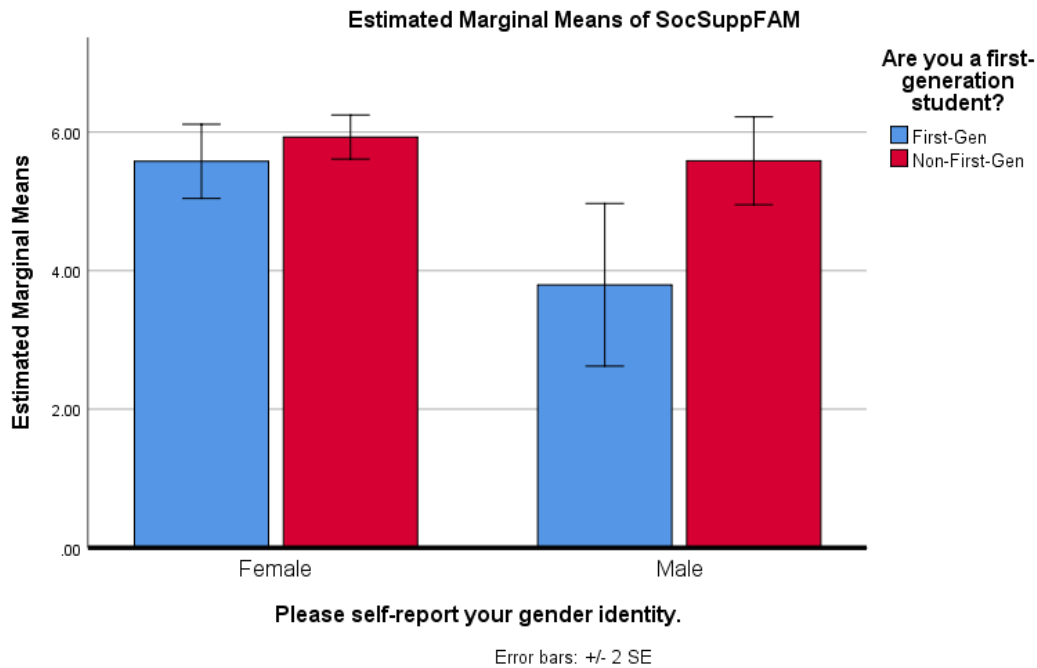
*A Summary of the Gender x First-Generation Interaction for Peer Support*



*Note.* For males, those students who were first-generation reported lower levels of peer support than non-first-generation students,  $t(38) = -2.79, p = .008$  (two-tailed). For females, peer support levels between first-generation students and non-first-generation students were not significantly different,  $t(171) = -.78, p = .435$  (two-tailed).

**Figure 4**

*A Summary of the Gender x First-Generation Interaction for Family Support*



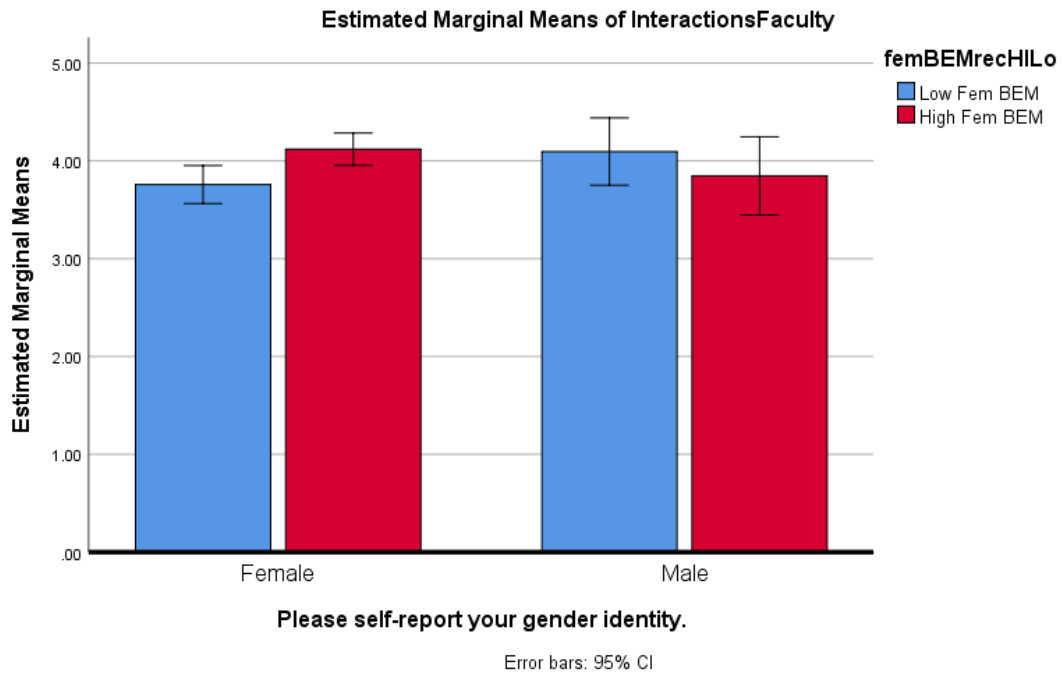
*Note.* For males, students who identified as first-generation tended to report marginally lower levels of familial support than those students who were non-first-generation,  $t(38) = -1.93$ ,  $p = .061$  (two-tailed). There was no significant difference between these first-generation groups for females,  $t(171) = -.95$ ,  $p = .342$  (two-tailed).

**Self-Identified Gender, BSRI Femininity and Interactions with Faculty.** Male and female students whose BSRI femininity scores “matched” their self-identified gender reported higher levels of positive interactions with faculty. See the figure and tables below. This result was not found for the masculinity scores; masculinity scores were equivalent across groups.



**Figure 5**

*An Illustration of the Interaction between Self-Identified Gender and BRSI Femininity Scores for Interactions with Faculty*



**Table 10**

*A Summary of the Analysis of Variance Results for the Self-Identified Gender and BRSI Femininity Scores for Interactions with Faculty*

**Tests of Between-Subjects Effects**

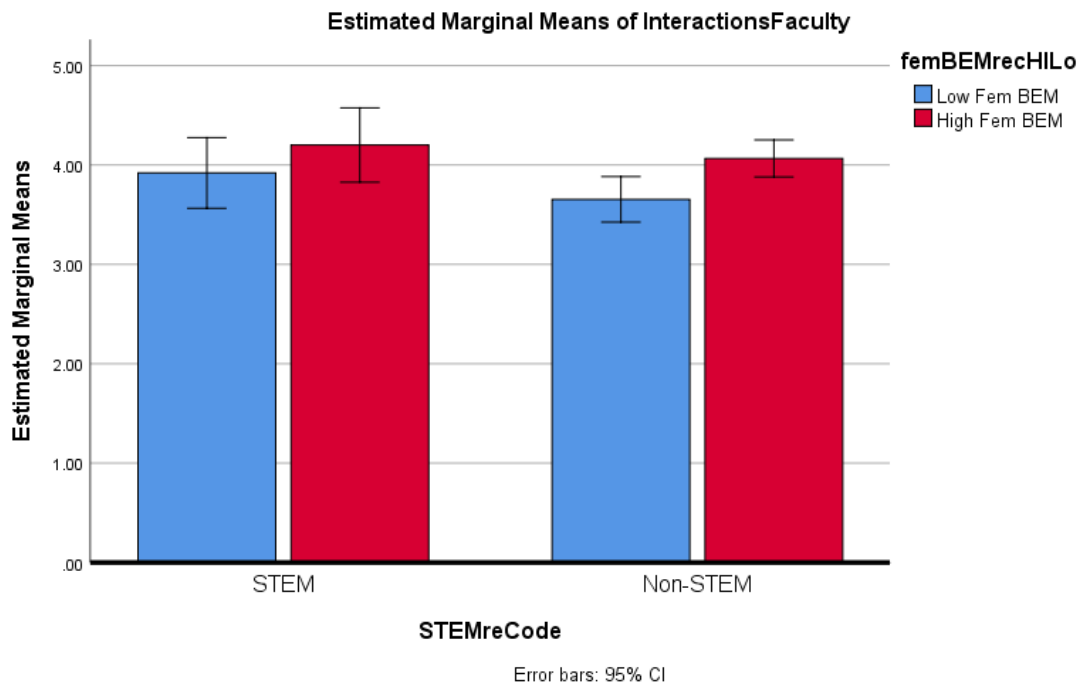
Dependent Variable: InteractionsFaculty

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6.094 <sup>a</sup>	3	2.031	2.894	.036
Intercept	1983.549	1	1983.549	2825.358	.000
genderidentity	.033	1	.033	.047	.829
femBEMrecHILo	.101	1	.101	.144	.704
genderidentity * femBEMrecHILo	2.951	1	2.951	4.204	.042
Error	146.027	208	.702		
Total	3497.880	212			
Corrected Total	152.121	211			

a. R Squared = .040 (Adjusted R Squared = .026)

**Figure 6**

*An Illustration of High and Low BRSI Femininity Groups for STEM and Non-STEM Majors with Interactions with Faculty as the Dependent Variable for Self-Identified Females*



*Note.* A main effect was found for BRSI femininity. Self-identified females with higher BRSI femininity scores report higher levels of faculty interaction/support. This is true for STEM and non-STEM majors.

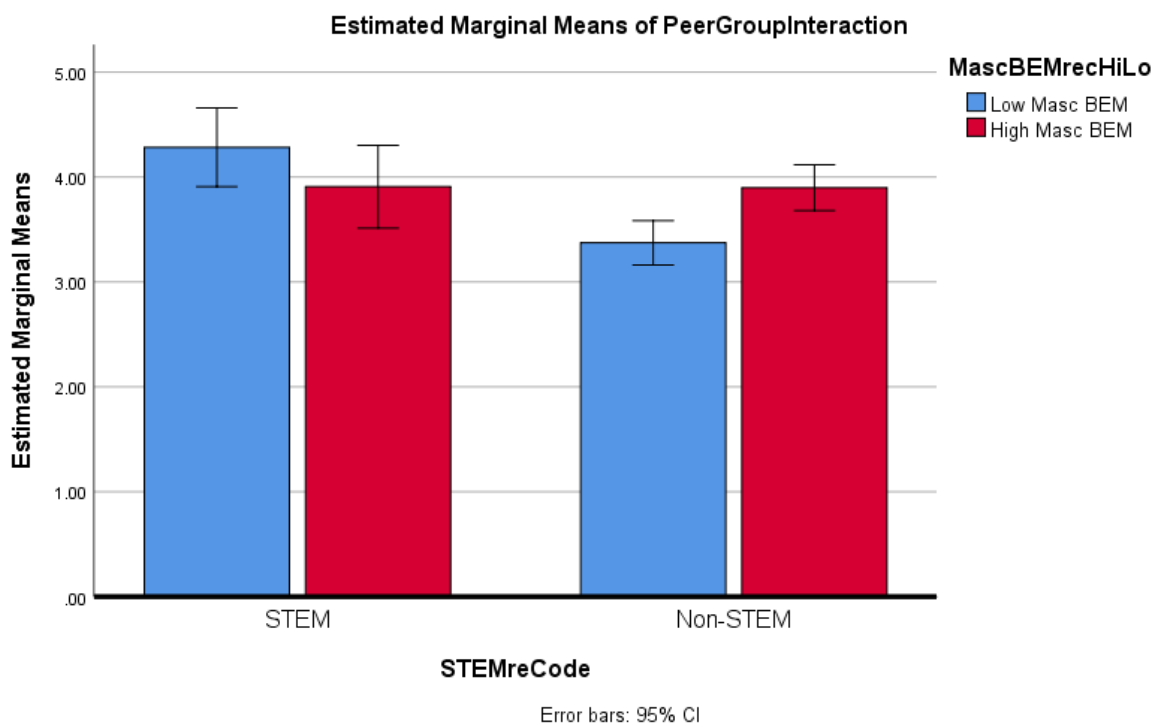
### **STEM, BRSI Masculinity, and Peer Group Interaction for Self-Identified Females.**

The following analysis was conducted on the self-identified females only. There were not enough self-identified males to perform these calculations. Thus, the results of a 2 (STEM versus Non-STEM) x 2 (High versus Low Masculinity) factorial ANOVA was conducted on the social support variables (faculty support, peer support, and family support). There was a main effect for STEM major with STEM majors reporting higher levels of peer interaction and support than non-STEM majors. However, this main effect was superseded by an interaction between

masculinity and STEM major. Specifically, non-STEM majors with low masculinity scores reported lower levels of peer support and STEM majors with high masculinity reported higher levels of peer support.

**Figure 7**

*An Illustration of Low and High BRSI Masculinity Scores by STEM/Non-STEM Major for Peer Group Interaction*



**Table 11**

*A Summary of the Analysis of Variance Comparing High and Low BRSI Masculinity Groups and STEM/Non-Stem Majors for the Dependent Variable of Peer Group Interaction*

**Tests of Between-Subjects Effects**

Dependent Variable: PeerGroupInteraction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16.372 <sup>a</sup>	3	5.457	7.556	.000
Intercept	1727.701	1	1727.701	2392.139	.000
MascBEMrecHiLo	.161	1	.161	.223	.637
STEMreCode	6.109	1	6.109	8.458	.004
MascBEMrecHiLo * STEMreCode	5.869	1	5.869	8.127	.005
Error	112.670	156	.722		
Total	2367.806	160			
Corrected Total	129.041	159			

a. R Squared = .127 (Adjusted R Squared = .110)

### Hypothesis Testing

**Hypothesis 1.** To test the hypothesis that social support would have a strong, positive association with academic outcomes, a series of correlation analyses were performed including multiple study variables that represent social experiences and those representing academic outcomes. In support of this hypothesis, there were several strong, positive associations between the social support variables and the variables representing academic outcomes. In fact, each of the variables demonstrated significant associations apart from the GPA variables (I.e., overall GPA and major GPA). See Table 12.

**Table 12***Pearson Correlations between Social Support Variables and Academic Outcomes*

	1	2	3	4	5	6	7	8	9	10	11	12
1-GPA												
2-Major GPA	<b>.85</b>											
3-Self-Efficacy	<b>.18</b>	<b>.17</b>										
4-Academic Dev	<b>.30</b>	<b>.24</b>	<b>.48</b>									
5-Choose BU	<b>.24</b>	.15	<b>.37</b>	<b>.61</b>								
6-Graduate BU	.16	.14	<b>.29</b>	<b>.58</b>	<b>.54</b>							
7-Peer Group	<b>.25</b>	<b>.21</b>	<b>.52</b>	<b>.48</b>	<b>.42</b>	<b>.39</b>						
8-Faculty	.08	.08	<b>.50</b>	<b>.51</b>	<b>.33</b>	<b>.39</b>	<b>.42</b>					
9-Soc Supp (G)	.00	.02	<b>.43</b>	<b>.45</b>	<b>.45</b>	<b>.34</b>	<b>.47</b>	<b>.37</b>				
10-Soc Supp (SO)	.01	.04	<b>.32</b>	<b>.36</b>	<b>.35</b>	<b>.23</b>	<b>.39</b>	<b>.29</b>	<b>.85</b>			
11-Soc Supp (FAM)	.01	.01	<b>.37</b>	<b>.34</b>	<b>.38</b>	<b>.29</b>	<b>.31</b>	<b>.29</b>	<b>.79</b>	<b>.46</b>		
12-Soc Supp (FRI)	.01	.01	<b>.38</b>	<b>.41</b>	<b>.39</b>	<b>.34</b>	<b>.47</b>	<b>.34</b>	<b>.84</b>	<b>.64</b>	<b>.49</b>	

*Note.* All Pearson  $r$  values in bold font are statistically significant at the .01 level of significance (one-tailed analyses as positive associations were predicted).

**Hypothesis 2:** To test the hypothesis that peer support and faculty support combined would have a strong, positive predictive relationship with academic outcomes, a series of multiple regression analyses were conducted with peer and faculty interactions as the predictor variables with GPA, college self-efficacy, and academic/intellectual development as the

dependent variables, respectively. The results of these analyses indicated that peer and faculty interactions were valuable predictors of academic outcomes for GPA, college self-efficacy, and academic/intellectual development. Peer and faculty interactions particularly were strong predictors for college self-efficacy and academic/intellectual development – in both cases, achieving an  $R^2$  of 35 and 36% and both contributing to the explanation of unique variance in the academic outcome variables. With regard to GPA as an academic outcome variable, although a significant model was achieved, the  $R^2$  only reached 6% and perceptions of peer interactions was the only predictor variable to reach significance. Interestingly, faculty interactions did not predict any variability in GPA with these data. See Table 13 for a summary of these three analyses.

**Table 13**

*Summary of the Regression Analyses Exploring the Value of Peer and Faculty Support in the Prediction of Academic Outcomes*

<b>IVs</b>	<b>DV</b>	<b><math>R^2</math></b>	<b><math>df1,df2</math></b>	<b><math>F</math></b>	<b><math>p</math></b>	<b><math>B</math></b>	<b><math>sB</math></b>	<b><math>t</math></b>	<b><math>p</math></b>
Faculty	GPA	.06	2,210	7.02	.001	-.01	.26	3.54	.000
Peers						.14	-.02	-.31	.759
Faculty	CSE	.37	2,220	64.45	<.00	.55	.34	5.77	<.001
Peers					1	.56	.38	6.45	<.001
Faculty	AIDev	.35	2,220	59.06	<.00	.33	.37	6.24	<.001
Peers					1	.26	.33	5.46	<.001

Note. CSE = College Self-Efficacy; AIDev = Academic & Intellectual Development

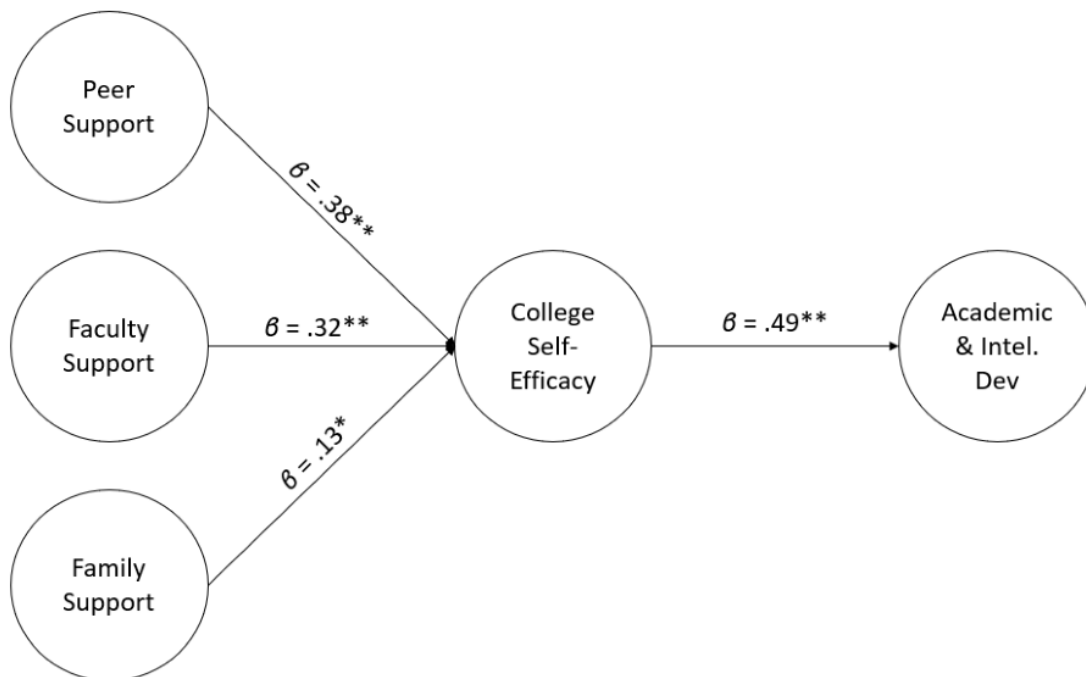
**Hypothesis 3**

First, the validity of a model was examined in which social support predicts college self-efficacy which predicts academic outcomes, without moderators. First, a hierarchical multiple regression was performed with faculty, peer, and family support as predictor variables and college self-efficacy as the criterion variable. A significant model was achieved,  $F(5,205) = 30.31, p < .001, R^2 = .4250$ . Second, a simple linear regression was conducted with college self-efficacy predicting perceived academic and intellectual outcomes, and a significant model was achieved,  $F(3,207) = 23.02, p < .001, R^2 = .25$ . See Figure 8, below, for a summary of these analyses and beta coefficients. In all analyses, the markers of SES (parent education and income) were entered into the equation first as control variables. Importantly, and somewhat surprisingly, these SES variables were not valuable predictors of any outcome variables in any analysis with these data.



**Figure 8**

*Pathway Model Illustrating the Predictive Value of Social Support on College Self-Efficacy and Academic and Intellectual Development*



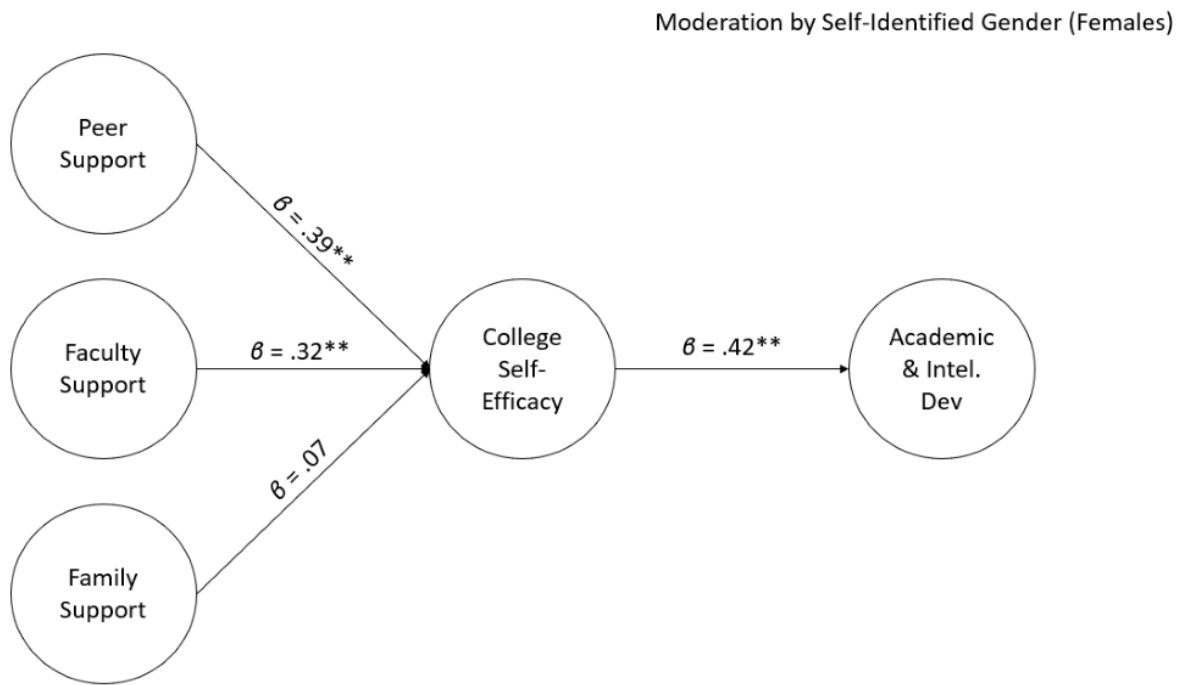
Note.  $**p < .001$ ,  $*p < .05$

**Moderations by Self-Identified Gender.** To explore the hypothesis that gender identity moderates the associations between social support, college self-efficacy, and academic outcomes, the pathway analyses reported above were repeated for each gender. Due to a limited sample size with males and the conservation of power, the data were stratified by gender (i.e., female and male) and the regressions were conducted separately for females and males. First, a multiple regression procedure was conducted predicting college self-efficacy from the three social support variables (peer, faculty, and family). A significant model was achieved for females,  $F(5,166) = 21.68$ ,  $p < .001$ ,  $R^2 = .40$ , and for males,  $F(5,33) = 9.88$ ,  $p < .001$ ,  $R^2 = .60$ . Second, the linear regression predicting academic and intellectual development yielded a

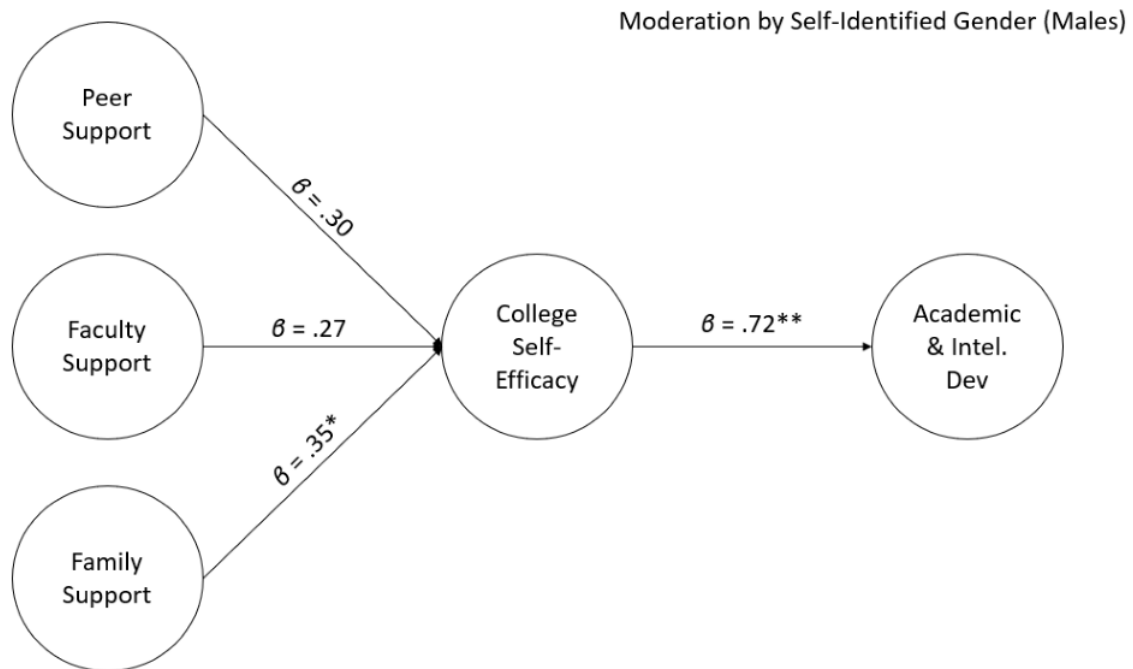
significant model for females,  $F(3,168) = 13.71, p < .001, R^2 = .20$ , and for males,  $F(3,35) = 13.62, p < .001, R^2 = .54$ . See Figure 9 (females) and 10 (males) below for a summary of these analyses.

**Figure 9**

*Moderation by Self-Identified Gender (Females)*



Note. \*\*p < .001

**Figure 10***Moderation by Self-Identified Gender (Males)*

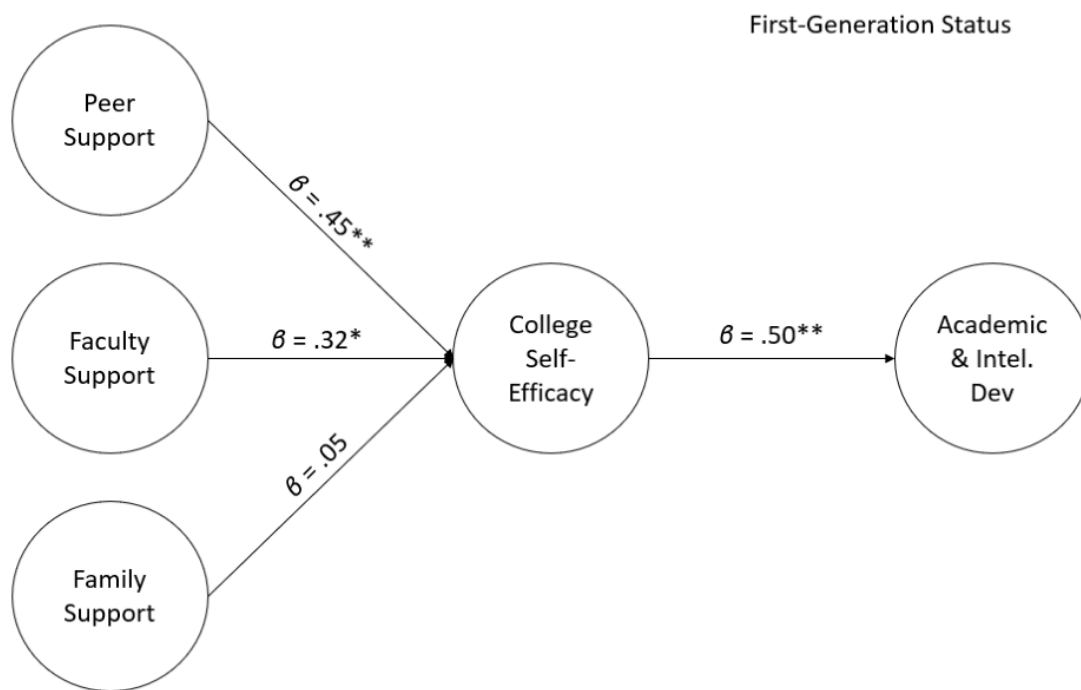
Note. \*\* $p < .001$ , \* $p < .05$

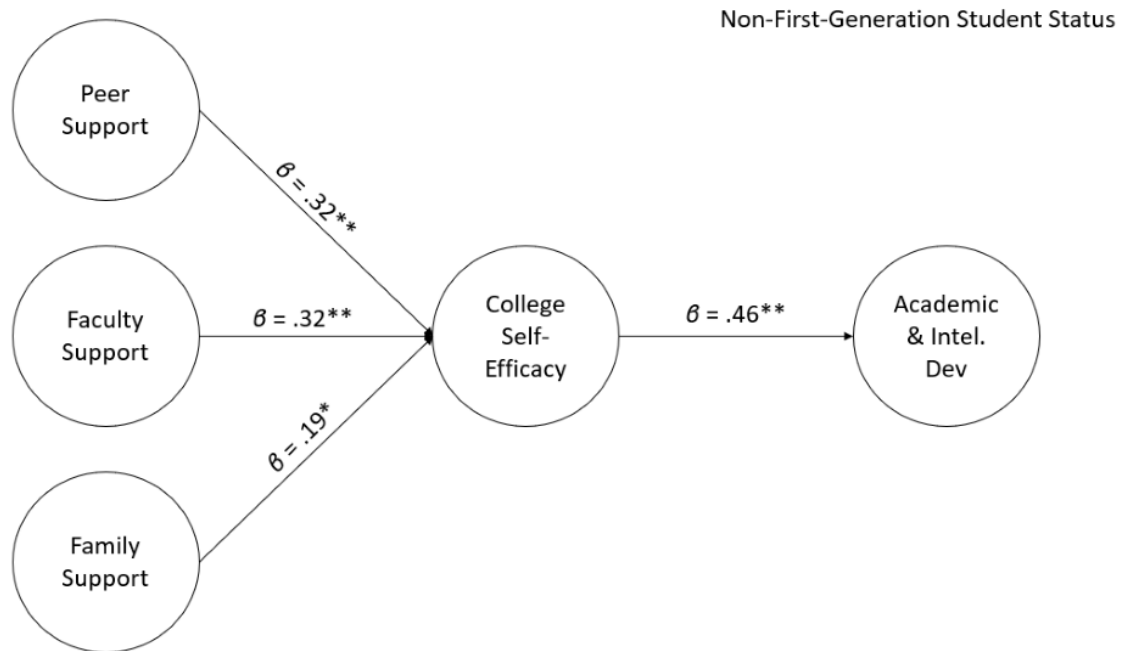
**Moderations by First-Generation Student Status.** To explore the hypothesis that first-generation student status moderates the associations between social support, college self-efficacy, and academic outcomes, the pathway analyses reported above were repeated for each first-generation and non-first-generation students. As with the gender analyses above, the data were stratified by first-generation status and the regressions were conducted separately for students reporting first-generation status and those not reporting this status. First, a multiple regression procedure was conducted predicting college self-efficacy from the three social support variables (peer, faculty, and family). A significant model was achieved for first-generation students,  $F(5,62) = 11.49, p < .001, R^2 = .48$ , and for non-first-generation students,  $F(5,137) = 17.77, p < .001, R^2 = .39$ . Second, the linear regression predicting academic and intellectual development yielded a significant model for first-generation students,  $F(3,64) = 9.48, p < .001,$

$R^2 = .31$ , and for non-first-generation students,  $F(3,139) = 14.31, p < .001, R^2 = .24$ . See Figure 11 (first-generation) and 12 (non-first-generation) below for a summary of these analyses.

**Figure 11**

*Moderation by First-Generation Status (First-Generation)*



**Figure 12***Moderation by First-Generation Status (Non-First-Generation Students)*

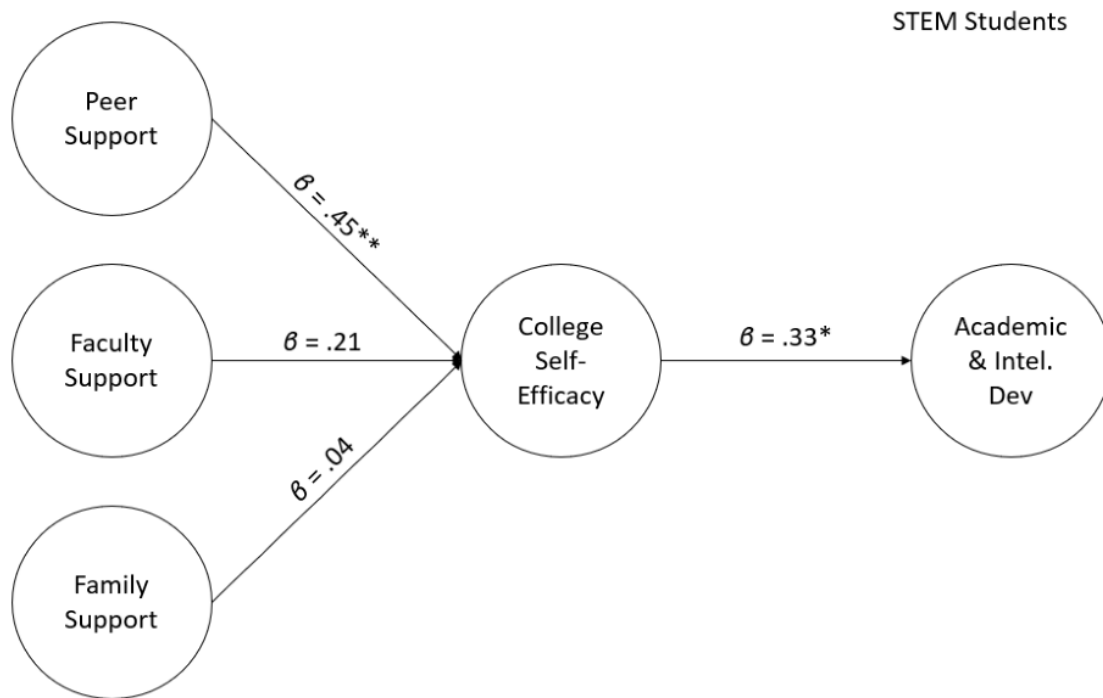
Note. \*\* $p < .001$ , \* $p < .05$

**Moderation by STEM Student Status.** To explore the hypothesis that major, specifically STEM versus non-STEM majors, might moderate the associations between social support, college self-efficacy, and academic outcomes, the pathway analyses reported above were repeated for STEM and non-STEM students. As with the analyses above, the data were stratified by STEM student status and the regressions were conducted separately for students reporting STEM majors and those not reporting a STEM major. First, a multiple regression procedure was conducted predicting college self-efficacy from the three social support variables (peer, faculty, and family). A significant model was achieved for STEM students,  $F(5,50) = 5.41$ ,  $p < .001$ ,  $R^2 = .29$ , and for non-STEM students,  $F(5,130) = 17.20$ ,  $p < .001$ ,  $R^2 = .40$ . Second, the linear regression predicting academic and intellectual development yielded a marginally significant model for STEM students,  $F(3,52) = 2.70$ ,  $p = .055$ ,  $R^2 = .14$ , and a significant model

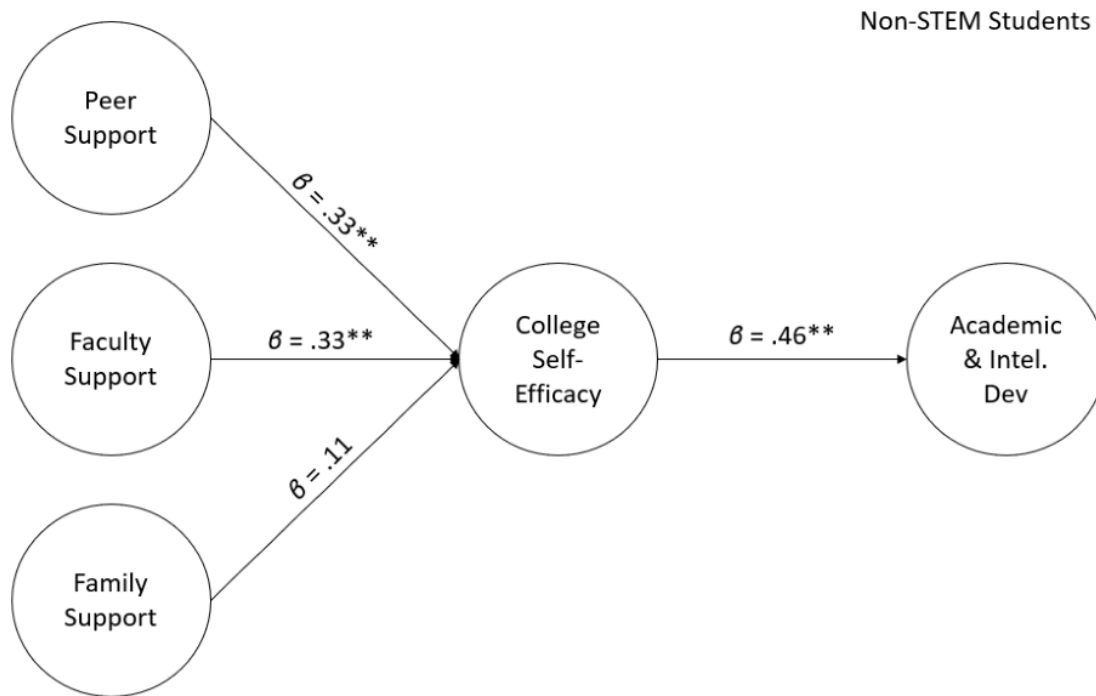
for non-STEM students,  $F(3,132) = 13.11, p < .001, R^2 = .23$ . See Figure 13 (STEM) and 14 (non-STEM) below for a summary of these analyses.

**Figure 13**

*Moderation by STEM Student Status*



Note.  $**p < .001, *p < .05$

**Figure 14***Moderation by STEM Student Status (Non-STEM)*

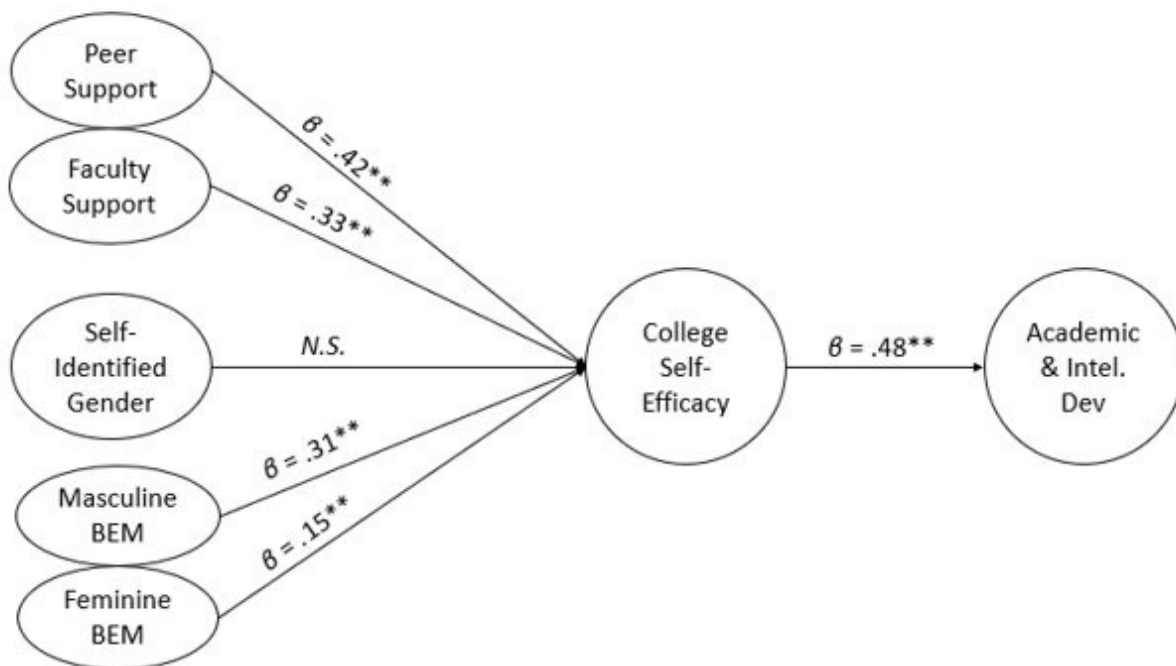
Note.  $^{**}p < .001$ ,  $^{*}p < .05$

**Value of Gender Expression Versus Gender Identity.** To explore the hypothesis that gender expression as measured by scores on the BRSI as opposed to self-identified gender identity would be more valuable in describing the associations between the study variables of interest, a multiple regression was performed with college self-efficacy as the dependent variable and support (peer and faculty) and gender (identity and expression) as the predictor variables. Peer and faculty support were entered in step one, self-identified gender in step two, and the BRSI masculinity and femininity scores entered in step three. Step one produced a significant *R*-Square,  $F(2,210) = 71.03, p < .001, R^2 = .40$  with the two social support variables. Step two (entering gender identity) was the only step that did not generate a significant increase in the amount of variance explained in self-efficacy,  $F(1,209) = 1.87, p = .17$ . The final model in the

step 3 with the addition of the masculine and feminine BRSI scores was statistically significant,  $F(5,207) = 45.91, p < .001, R^2 = .53$  and the standardized beta weights for the final model are reported in the Figure 15 below.

**Figure 15**

*Summary of Multiple Regression Procedure Demonstrating the Value of Gender Expression Compared to Dichotomous Self-Identified Gender in the Prediction of College Self-Efficacy*



Note.  $^{**}p < .001$ ; Overall Model:  $F(5,207) = 45.91, p < .001, R^2 = .53$

## Discussion

The purpose of this study was to examine the relationships between social support (specifically from family, peers, and faculty), self-efficacy, and academic outcomes (specifically, academic and intellectual development; AID). Another intention of this study was to examine the differences between these relationships for the participants of the study when using their



respective gender identity, gender expression, and major as separate moderators. Further, this study aimed to examine which type of social support (family, peers, or faculty) has the strongest relationship with self-efficacy, when social identity variables (gender identity, gender expression, and major) are considered. Finally, this study aimed to investigate if there were meaningful differences between gender identity and gender expression measures, in an attempt to argue that traditional measures of gender (which typically only measure a female/male dichotomy) are insufficient in research studies, and that gender expression measures, such as the BSRI, present valuable information (that is otherwise looked over) that all individuals should keep in mind in our modern world.

An overview of the hypotheses previously presented in this thesis, based upon the purpose to this thesis and the research questions previously proposed, can be viewed again in the table below, Table 1. Preliminary results were previously presented, and the explanation as well as the implications and applications of these preliminary results will be discussed in the following section.

**Table 1***A Summary of the Primary Hypotheses of This Thesis.*

H <sub>x</sub>	Variable 1	Predicted Relationship (PR)	Other variable(s)	Other Notes
H <sub>1</sub>	Overall social support	+	College self-efficacy; academic outcomes (AID)	A series of Pearson correlations; generation of correlation matrix
H <sub>2</sub>	Value of individual and combined social support as predictors of	+	College- self-efficacy; AID	Multiple regression analyses
H <sub>3</sub>	Social identity (gender, 1 <sup>st</sup> gen, major)	Moderating the above pathway model	Social support (SS), self-efficacy (SE), & academic outcomes (AO)	
H <sub>3-1</sub>	STEM student self-efficacy	+	Academic & intellectual development (AID)	This relationship will be stronger for STEM students than non-STEM students.
H <sub>3-2</sub>	STEM students	More positive	Self-efficacy; AID than non-STEM students.	
H <sub>4</sub>	Social support	+	Academic outcomes	More likely if the participant is feminine & a STEM major
H <sub>4-1</sub>	Social support	+	Academic outcomes	More likely if the participant is masculine & not a STEM major
H <sub>5</sub>	BSRI	+	SS, SE, & AO	Stronger correlation than with self-reported gender in place of the BSRI.
H <sub>6</sub>	Faculty support	+	Academic outcomes	Faculty will be more strongly correlated with AO than peers or family.
H <sub>7</sub>	Self-efficacy	+	AID	

### **Implications and Applications**

There are several foreseeable implications and applications with the preliminary results of this study. These implications and applications will slowly begin to be explored by revisiting each hypothesis one by one in the following paragraphs. There are many more foreseeable implications and applications of these preliminary results and further data analysis that cannot be accurately discussed at this time, beyond tossing around hypotheticals. Here, I will focus mainly on my main hypotheses.

Hypothesis 1 allowed for the exploration of potential associations among all study variables of interest with a specific focus on the associations between social support variables and academic outcomes. A series of Pearson correlations produced a correlation matrix displaying positive associations between many study variables of interest with some emerging patterns. First, GPA did not appear to be a valuable variable in that overall GPA was strongly associated with major GPA ( $r = .85$ ) but was not strongly associated with any other variable (aside from a positive association,  $r = .30$ , with academic and intellectual development, and a weak association with college self-efficacy,  $r = .18$ ). Notably, GPA was not associated with any measure from the Social Support scale with all  $r$ -values  $< .08$  (although overall GPA was positively associated with peer group interaction at  $r = .25$ ).

Although GPA, an academic outcome variable, was not reliably or impressively associated with any measure of social support or college self-efficacy, the student perceptions of academic and intellectual development variable was strongly and consistently related with each measure of social support (all  $r$ 's  $> .32$ ) as well as self-efficacy ( $r = .48$ ). These strong associations – and the weak associations produced by GPA – provided more evidence as to the inclusion of this variable (AID) as the academic outcomes variable in the model testing. The

significance of AID within this study implies that AID may be a more sophisticated and accurate measure of academic success than GPA is. AID captures academic experiences and success beyond numerical numbers. This tells us that evaluations on a student's performance should not be based solely upon their GPA, but the other ways in which they have developed other their academic career. I digress, as this is not the main focus of this study, although this is a valuable preliminary result.

Peer group interaction, faculty support, and overall measures of social support were all strongly, positively associated with college self-efficacy. Thus, even without testing for social identity moderators, these findings suggest strong and important relationships between social support and academic outcomes for college students. These preliminary results show that social support is vital to academic outcomes, supporting the place of social support within theories such as the SCCT. Social support impacts academic outcomes, just as we know that individuals who live on campus and are involved in campus activities may have higher GPAs (Mayhew et al., 2016). Future research would do well to further explore this impact on introverted and extraverted students, specifically. However, with this knowledge of the importance of overall social support, we are equipped with the knowledge that students need some type of social support in order to perform well and achieve in the classroom.

Hypothesis 2 allowed for a more formal and sophisticated approach to examining the associations between social support, self-efficacy, and academic outcomes in college students. This hypothesis purported the existence of valuable predictive associations between the social support variables (individually and collectively), self-efficacy, and academic outcomes. The results of these analyses were reflective of the above correlations in that self-reported GPA as an outcome variable produced a significant model but one that was significantly weaker than the

models including academic and intellectual development and college self-efficacy. In fact, when considered together, student perceptions of faculty and peer support were able to explain 37% of the variance in college self-efficacy and 35% of the variance in academic and intellectual development. These are impressive amounts of explained variance and highlight the importance and value of building community and connections with faculty and peers, as well as the importance of measuring development beyond GPA.

Hypothesis 3 extended hypothesis 2 as I wanted to go more in-depth with the ways in which social identity may moderate the relationships between social support, self-efficacy, and academic outcomes. My thinking was that specifically, individuals who belong to majority identity groups, such as non-first-generation student status and male gender identity, may be less likely to show a strong, positive correlation in social support and academic outcomes; essentially, academic social support will matter less. This may be due to the fact that these individuals are not typically marginalized by their communities, because they belong in the majority groups that are typically more well-respected, generally. Likewise, individuals in minority groups, such as self-identified females and first-generation students, may be more likely to have a strong, positive correlation in social support and academic outcomes; essentially, social support will matter more. I also will explore major (STEM versus non-STEM) as a moderating factor for these associations between social support, self-efficacy, and academic outcomes.

First, before addressing these potential moderations, a base model illustrating the predictive value of social support on college self-efficacy and then college self-efficacy predicting academic and intellectual development was established including the entire population. In this base model, peer, faculty, and family support explained unique variance in

college self-efficacy after controlling for estimations of SES. From there, college self-efficacy was strongly and positively predictive of academic and intellectual development.

With the significant base pathway model established, the next step was to determine if these identified associations may be moderated – or be different for – any social identity groups. The first social identity moderation tested was for the self-identified genders, comparing the base model for males and females. A significant model was achieved for both males and females. For females, however, the value of family support in the prediction of self-efficacy diminished and became non-significant as peer and faculty support remained strong. Interestingly, the findings for self-identified males was reversed, and family support explained unique variance as peer and faculty support dropped to non-significance. Although a note of caution is warranted for interpreting this model for males as there was a very small number of self-identified males and such an analyses with multiple variables is contraindicated.

As a side note, an unfortunate one, I intended to test this model as being moderated by the social identity variable of gender expression (based on the masculine versus feminine BRSI responses). However, I was unable – and Dr. Wolfe was unable – to achieve success running this model due to low variability in responses on one of the variables. I did, however, explore the base model with the addition of gender as a predictor of college self-efficacy. In this analysis, I was able to compare the relative value of gender identity versus gender expression in the prediction of self-efficacy in the first step of the model. In line with the purpose of this thesis, the results of this analysis offered strong support for the value of considering BRSI masculinity and femininity scores instead of self-identified categorical gender. BRSI masculinity and femininity scores contributed to the explanation of unique variance above and beyond the social support variables in the prediction of college self-efficacy while self-identified gender did not.

In addition to the moderations by gender, I was able to compare this base model for first-generation student status and found a significant moderating effect. Specifically, for students who are first-generation, peers and faculty contributed to the explanation of unique variance and thus the prediction of college self-efficacy while family support was nearly zero. For non-first-generation students, peers, faculty, and family all three contributed to the prediction of college self-efficacy.

Finally, I tested potential moderations of this model by major, specifically STEM versus non-STEM. There was a moderation by major. Specifically, for STEM students, interactions with peers was strongly, positively predictive of college self-efficacy while faculty and family support failed to reach statistical significance. For non-STEM majors, peers and faculty both were found to be important predictors of college self-efficacy with family support failing to reach significance. Overall, hypothesis 3 was not well supported, as different types of social support matter more or less for different groups. Many groups had significant correlations between the same specific social support groups and their self-efficacy. With these preliminary results, it seems that social support cannot be closely tied with social identity, and social support is a unique experience for all individuals. With this knowledge, we know that social support is important for all and is important to keep in mind when attempting to create communities of inclusivity and belonging on college campuses. All students need a place where they feel supported, and those places of support look different for everyone; they may not be the most obvious places. We must be strategic in the creation of community.

Wanting to further examine the implications of being a STEM major, hypothesis 3-1, as an extension of STEM as a moderating factor in hypothesis 3, specifically explores the correlation between self-efficacy and academic and intellectual development as it relates to

students in STEM majors. My thinking here was that individuals who are in STEM majors would be more likely to have confidence (self-efficacy) that is closely tied to their academic and intellectual development, pushing them to remain in their STEM major. I am not attempting to discount non-STEM majors, and do think that self-efficacy and academic and intellectual development will be strongly correlated regardless of major (hypothesis 7), but instead am trying to show that the majority of individuals who are STEM majors must at the very least the confidence that they will develop and perform well academically. It may be more pertinent for STEM students to have this self-efficacy related to their academics.

In the preliminary analyses of this study, when two models were completed with STEM and non-STEM majors as the moderators for the relationships between social support, college self-efficacy, and AID, we can see that there are significant correlations between college self-efficacy and AID regardless of major. This supports hypothesis 7. Knowing that college self-efficacy and AID are significantly correlated tells us of the importance that college self-efficacy has in student development. Students must have the confidence that they can succeed and that they can perform well in school, as well as the confidence that their academics and intellect are not fixed, and that they can grow. With this in mind, colleges must be aware of the importance of self-efficacy and the ways in which they can instill confidence within their students on campus. This may be achieved with expectations and fostering a welcoming community for all.

Although STEM majors within this study generally had higher GPAs, higher levels of peer support (self-identified females with high masculinity; this will be discussed later), and higher levels of college self-efficacy than non-STEM majors, the correlation between college self-efficacy and AID was slightly less significant for STEM majors than it was for non-STEM majors. This does not support hypothesis 3-1. The implications of this finding within these



preliminary results are that college self-efficacy is important for AID, no matter your major. Perhaps we would have seen a stronger correlation with college self-efficacy and GPA between majors, if GPA was used as the outcome variable instead of AID. Regardless, having college self-efficacy is an important piece of development in college.

Additionally, with hypothesis 3-2, individuals within STEM may have higher self-efficacy and higher AID than individuals who are not in STEM. As previously stated, STEM majors did have higher levels of college-self-efficacy, though there was no significant difference between STEM and non-STEM students' AID. This may suggest that STEM students require certain college self-efficacy skills, more so than non-STEM majors.

I also wanted to explore the results of the BSRI as a moderating factor for the associations between social support, self-efficacy, and academic outcomes. Beyond adding to existing literature surrounding the SCCT, I felt that it was important to consider the impact that gender has within out school lives. Specifically, I wanted to be able to evaluate more of the nuances found within gender, beyond the female/male dichotomy that psychologists typically use within their studies. Using a female/male dichotomy felt outdated to me, as the ways in which we identify our own genders change as we acknowledge the distinct differences between gender identity, gender expression, and sex. I knew that gender roles were important to examine, beyond the traditional flat female/male gender dichotomy. Hypothesis 4 brings in these thoughts.

With hypothesis 4, and by extension 4-1, my thinking was that social support would be more important for an individual if they were majoring in a subject that did not traditionally "match" their femininity or masculinity, based on traditional gender roles. So for feminine individuals to be in a STEM major, they would need extra social support and would perceive their social support, from any group (family, peers, or faculty), as valuable to their academic

outcomes; as their social support increases, generally their positive academic outcomes would increase as well. For masculine individuals within STEM, social support would be needed less for them to have positive academic outcomes. The reverse of this is described with hypothesis 4-1; for masculine individuals who are not STEM majors, social support will be positively correlated with their academic outcomes. For these individuals, social support will matter more to them in pushing their development and positive outcomes than it will for individuals who are feminine and not STEM majors. Overall, I thought that I would find that there still exists some disparity between gender roles and chosen major, and in order to overcome these disparities and gender role barriers, social support would be a key factor.

With the preliminary findings of this study, support for and against this hypothesis is currently limited. However, as stated previously, it was found that specifically, non-STEM majors with low masculinity scores reported lower levels of peer support, and STEM majors with high masculinity reported higher levels of peer support. This was only shown with individuals who self-identified themselves as female. It is important to note here that having high masculinity does not necessarily mean having low femininity, while having high femininity does not necessarily mean having low masculinity. Nevertheless, the preliminary results of this study do not support hypotheses 4 and 4-1.

It seems that for self-identified females, when they major in something that traditionally matches their level of masculinity, it depends upon the major if they perceive high or low levels of social support. Self-identified females who were low in masculinity and were non-STEM majors had lower levels of peer support. This initial finding does begin to support hypotheses 4 and 4-1, because these self-identified females' masculinity level "matches" what is traditionally expected for an individual who is in a non-STEM major, and their peer support is lower.

However, hypotheses 4 and 4-1 are invalidated with the second half of this analysis. Self-identified females who were majoring in STEM and had high masculinity, something that “matches” traditional expectations, had higher levels of peer support. My original thinking here is contested, as I thought that individuals who majored in a subject that did not traditionally “match” their gender expression would report higher levels of peer support, as they may need it in order to continue to pursue that major. In fact, it seems with these preliminary results that the opposite may be true. Individuals who are within majors that traditionally “match” their gender expression (though not their gender identity) seem to have higher levels of peer support.

With this in mind, the implications here are that self-identified females who are in STEM receive support (which may help their self-efficacy and academic outcomes) only when they are more masculine. In order for a self-identified female to pursue a career, their gender expression may have to traditionally “match” what is expected for that career, i.e. having more masculinity within STEM fields, and having more femininity within non-STEM fields. Although this does not quite support my hypotheses 4 and 4-1, this preliminary finding does support the idea that measuring gender identity alone is insufficient. Even if an individual self-identifies as female, their masculinity level may be higher than expected, and that may show us why self-identified females choose certain careers over others.

Future research would do well to explore the socialization of self-identifying females who work or plan to work within STEM. Future analyses would do well to more the relationships between social support more generally, as well as faculty, family, and other support more specifically, as well as recruit more individuals who self-identify as male so that these analyses can be run with self-identifying male students. As far as I can currently see with these preliminary results, masculinity may be important in gaining peer support for self-identified

females. If masculinity is correlated with support, this would show us how self-identifying females have, over time, begun to fit into a masculine-dominated world by becoming themselves more masculine. Additionally, in these preliminary results, masculinity did not vary significantly among self-identified females and males, though femininity did. This may suggest that women have had to change themselves in order to fit into male standards of the world. Although, the BSRI masculine items did include things such as “I have leadership ability” (which reflects the date of the BSRI), and, from my own personal point of view, there are many female leaders within Bellarmine’s campus.

Unfortunately, femininity may be lost within this, raising new questions: why can’t a woman be feminine *and* work within STEM? Then would she lose respect, and start to be harassed within the workplace? Must women be masculine in order to break the glass ceiling? What perspectives and insights do we then lose by fitting into a masculine world, other than creating our own paths? How does this translate to race and ethnicity, for individuals who may feel as though they must “act white” in order to succeed themselves within certain environments and careers? Essentially, there are deeper analyses that must be conducted using gender expression measures, and new awareness of identity that we all must educate ourselves on. There is a bigger picture here, and we are just beginning to uncover it.

Further, specifically testing the BSRI, with hypothesis 5 I thought that measuring an individual’s gender expression would tell us more of the story of how their perceived social support, self-efficacy, and academic outcomes correlate with one another. Specifically, I felt that the correlation between social support and self-efficacy would be stronger when moderated by the BSRI, as it may be when moderated by self-identified gender (which, in this study, was limited to female/male). I felt as though the BSRI, looking at these relationships through the lens

of gender expression, would give us better insight into these relationships. The correlations between social support, self-efficacy, and academic outcomes may not be positive, but I was thinking that the correlations would be stronger than with self-identified gender.

The preliminary results within this study support hypothesis 5. As represented with figure 15, using responses on the BSRI (gender expression) was a better, more significant predictor in college self-efficacy than self-identified gender was. Self-identified gender had no significant role as explaining variance within self-efficacy, while BSRI masculinity and BSRI femininity were both significant in explaining variance within self-efficacy. This means that changes in a student's level of college self-efficacy can be partially and meaningfully explained with their gender expression, though not with their self-identity. This preliminary result supports the idea that measuring gender beyond the female/male dichotomy is valid and meaningful, and tells us more about an individual. How masculine and how feminine a person is in their actions tells us more about their confidence, as well as their academic outcomes and successes. When we keep in mind an individual's gender expression, we are able to avoid putting the individual within a confined female or male box, with attention to the real reasons why individuals have the confidence they do and make the choices that they do. We put the focus on the gender roles that continue to plague our society. Individuals are more than their self-identified gender, which is often based on their assigned sex.

Moving back into more general associations, hypothesis 6 is a primary hypothesis as it isolates faculty support from peer and family support. More specifically, I felt that the relationship between faculty support and major choice would be strongly correlated. This may be due to higher levels of self-efficacy and academic outcomes as well, which the faculty support would ideally give the student. Generally, I thought that faculty support would be more

important for young undergraduate students who need mentors to guide them as they begin their college journey. This may especially be true for individuals who were undecided when coming into college.

The argument that the preliminary results of this study support hypothesis 6 is not generally supported. For specific groups, such as self-identified females, first-generation students, non-first-generation students, non-STEM students, faculty support is statistically significantly correlated with college self-efficacy. Generally, as well, faculty support is statistically significantly important for college self-efficacy. However, as presented with the moderation model (figure 8), faculty support is not the most important social support factor within this study, as it relates to the college self-efficacy a student has. Peer support is more significant overall, and family support is significant as well.

These preliminary results are valuable, and do not necessarily discount faculty support altogether. Instead, these preliminary results show us that social support, generally, is correlated with self-efficacy and is valuable. Different types may be more valuable to different people, but nevertheless I will again state that social support is likely an important piece of the SCCT. Perhaps there is a culture on Bellarmine's campus that puts the focus of social support away from faculty; future research and analysis would do well to explore campus culture further.

Beyond my hypotheses, there were other preliminary results that were found that I will briefly discuss in the following paragraphs. I feel that these preliminary results are important to discuss and consider as well as the preliminary results that pertain to my main hypotheses. The majority of the following paragraphs are surrounding preliminary results on gender, that have not been previously discussed thus far.

Regarding the BSRI, participants with high scores on the BSRI femininity scale report higher levels of faculty support, peer support, family support, college self-efficacy, and academic and intellectual development than those who scored low in femininity. This may be unique to Bellarmine, particularly for this group of mainly self-identified female students. However, it is interesting to note that femininity can push higher levels of these factors. Further, another interesting preliminary result of this study is that male and female students whose BSRI femininity scores “matched” their self-identified gender (self-identified males who have low femininity, and self-identified females who have high femininity) reported higher levels of positive interactions with faculty. This result was not found for the masculinity scores; masculinity scores were equivalent across groups. For example, self-identified females with higher BSRI femininity scores report higher levels of faculty interaction/support. This is true for STEM and non-STEM majors. This particular finding may tell us of the ideas surrounding femininity that faculty generally may have. Femininity, as all participants were fairly equal with their masculinity scores, seems to give an extra touch to an individual that is noticed.

It is interesting that masculinity scores did not change much among self-reported genders, though femininity did. Additionally, it is interesting that masculinity seems to be correlated with peer support. Like women were forced to become more masculine, more “tough,” in order to get places in society. What if men had to become more feminine? Although, as I stated previously, the items within the BSRI that are considered to be “masculine” include an item about leadership ability. This dates the BSRI, as there are many women leaders throughout the world today, likely more than in the 70s, especially at Bellarmine. Women are leaders all over campus. This shows that what is traditionally considered to be masculine are things that should just be considered human, things that should just be considered smart or valuable life skills. This reflects the

historically sexist job market, as presented previously with the disparaging numbers between women and men within STEM (“Women and Men in STEM Often at Odds Over Workplace Equity,” 2018), as well as the discouragement that sexual minority students feel (Hughes, 2018). What are masculine traits, really? For that matter, what really are feminine traits? All traits should just be considered human, though this is the way in which the social construction of gender exists within our society. This is food for thought, and an argument to explore at another time.

There were a couple of findings that did not pertain to gender as well. Within the moderation model, for first-generation students, peer support was significant. For non-first-generation students, peer support and faculty support were most significant. This is an interesting finding, especially considering the potential role of a family, specifically parents, in obtaining social support throughout college. I may have previously thought that individuals who were first-generation would not have the family social support that non-first-generation students may have. In fact, these preliminary results show something else. First-generation students may rely solely on peer support, while non-first-generation students may have the knowledge and the comfort in relying on peers as well as faculty. With the importance of faculty support, this finding is important to keep in mind. Programs such as the Pioneer Scholars program at Bellarmine may help to encourage first-generation students to rely not only on their peers, but to foster closer relationships with their faculty as well. If first-generation students can achieve this, perhaps they will be more confident.

Another finding that is not specifically related to gender is that individuals who are first-generation generally had lower GPAs, and their parents had less education and less income compared to those who are not first-gen. Going along with the previous finding, this supports the



idea that first-generation students require extra social support in order to gain confidence and succeed academically. First-generation students need that extra push. Specifically, as stated previously, for males, those students who were first-generation reported lower levels of peer support than non-first-generation students. For males, students who identified as first-generation tended to report marginally lower levels of familial support than those students who were non-first-generation. These effects are seen specifically with self-identified males. This may be unique to Bellarmine, a female dominated school.

Previous research has suggested that gender measures within psychology are outdated and there must be changes (e.g., Fraser, 2018). This thesis supports this claim. Many pieces of preliminary results have shown us that using a gender expression measure, we are able to better understand the relationships between social support, self-efficacy, and AID among undergraduate college students. This likely holds true for other populations that are more diverse, and that are not within a school environment. Previous research as well has suggested that social support and self-efficacy contribute to major choice goals, with the SCCT (Lent et al., 1994; 2000; as cited by Lent et al., 2005). This thesis supports this claim as well. Social support and self-efficacy shift with major and gender, likely influencing our major choices. My original contribution is this study and these preliminary results, and my reflections and evaluation on this process can be found in the following sub sections.

Essentially, traditional measures of gender do not tell the whole story, as Fraser (2018) summarized and defended. Gender is part of our identities and inherently influences the ways in which we perceive the world, our treatment from others, and our places and roles within society. It is important that we remember to be careful and selective of our language surrounding gender, and move into different measures that more accurately represent the gender roles and ideas

within our society. Knowing if someone identifies as a male or a female is not the whole picture. It is important that we foster self-efficacy, and pay attention to the social support that students receive. The lack of it may cause difficulties succeeding in academia. More goes into doing well in school and choosing a major than having an interest in what you're studying. Overall, investigating choice in major and career is a large project to tackle, especially when trying to tackle gender measurement as well. However, this thesis shows that research must keep pushing to discover more about career choice (within the SCCT or in other ways), and to examine gender measures thoroughly.

With these preliminary results, additionally, the importance of family, faculty, and peer support is present, as well as the importance of self-efficacy within collegiate life. Social identity pieces, including first-generation status and personality, are important factors to consider as well. Colleges and universities have some say within their social support, and must keep in mind the various social identities of their students. As originally presented by the studies that I introduced in the beginning of this thesis (Dennis et al., 2005; Goodrich, 2012; Kendricks et al., 2013; McCallen & Johnson, 2019; Schenkenfelder et al., 2019), social support plays a big role and can create positive change within the life of a student, when done appropriately. Colleges and universities must be aware of this, and adjust accordingly in order to completely support all students in the best ways that they can.

The purpose for this study was to examine the complex relationships among gender, STEM, social support, self-efficacy, and academic outcomes, and how they are associated with choice and success in academic settings. With these preliminary results, this study has supported the validity of exploring gender expression, as well as the connections between social support, self-efficacy, and academic outcomes as they relate to STEM and non-STEM majors. Further

analyses may be able to further detail these relationships, though this study was able to support the validity of those further investigations. There clearly are complex relationships among these variables that impact our lives, and are worth further future investigation.

Again, please view Table 14 below, with a summary of the primary hypotheses within this thesis, as well as a summary of the presence of support for each hypothesis.

**Table 14**

*A Summary of the Primary Hypotheses of this Thesis, and a Summary of the Presence of Support by the Preliminary Results Previously Presented*

H <sub>x</sub>	Variable 1	PR	Other variable(s)	Other Notes	Supported?
H <sub>1</sub>	Overall social support	+	College self-efficacy; academic outcomes (AID)	A series of Pearson correlations; generation of correlation matrix	Yes
H <sub>2</sub>	Value of individual and combined social support as predictors of	+	College- self-efficacy; AID	Multiple regression analyses	Yes
H <sub>3</sub>	Social identity (gender, 1 <sup>st</sup> gen, major)	Moderating the above pathway model	Social support (SS), self-efficacy (SE), & academic outcomes (AO)		No
H <sub>3-1</sub>	STEM student self-efficacy	+	Academic & intellectual development (AID)	This relationship will be stronger for STEM students than non-STEM students.	No
H <sub>3-2</sub>	STEM students	More positive	Self-efficacy; AID than non-STEM students.		Partially supported
H <sub>4</sub>	Social support	+	Academic outcomes	More likely if the participant is feminine & a STEM major	Preliminarily, no
H <sub>4-1</sub>	Social support	+	Academic outcomes	More likely if the participant is masculine & not a STEM major	Preliminarily, no
H <sub>5</sub>	BSRI	+	SS, SE, & AO	Stronger	Yes

				correlation than with self-reported gender in place of the BSRI.	
H <sub>6</sub>	Faculty support	+	Academic outcomes	Faculty will be more strongly correlated with AO than peers or family.	No
H <sub>7</sub>	Self-efficacy	+	AID		Yes

Additionally, the preliminary results show us more about the validity and reliability of these scales. Although the sample population was not extraordinarily large, this survey received an efficient number of respondents that makes this information is valuable to future researchers who are investigating the scales that they would like to investigate for their own study. Namely, the Institutional and Goal Commitments as well as the Faculty Concern for Student Development and Teaching scales from the IIS did not have much inter-item reliability, as well as the need for approval scale pulled from two scales listed on the IPIP (specifically cited previously). Future researchers should keep this in mind, and find other scales that measure the impact of the university and faculty and the need for approval from others, if desired. Further, it is important to keep in mind that the wording of some of the items within the study may have been confusing to some participants. This refers mainly to questions from the IIS which used wording such as “few of the students I know would be willing to listen to me and help me if I had a personal problem” from the Peer-Group Interactions sub-scale.

The most important of these scales, arguably, for changing the landscape of measuring characteristics within the field of psychology, is the BSRI. My contribution to psychological research is this usage of the BSRI among college students. Additionally, this thesis adds to

previous research on the newly developed SCCT, a theory that needs to be tested and researched more. The big takeaways from this thesis are that it is important to foster self-efficacy and create communities of social support among college campuses, as incoming first-year undergraduate students may have varying levels of social support and self-efficacy. It is important that students have confidence to succeed, beyond their general interest in their major and/or career. Having self-efficacy can push students to become ambitious, and influences major choice. We must be careful with our language and the ways in which we measure gender, and it is worth it to expand research on gender; there are key findings hiding within this expansion.

### **Limitations & Future Research**

Because this study was completed by humans and with humans, it is not without its limitations. One such limitation is the demographics and characteristics of our participants. Our results may be partially biased, as the overwhelming majority of participants attend Bellarmine University. Bellarmine is a small, private, liberal arts, independent, Catholic university within Louisville, KY. Bellarmine is mostly female, with 1,642 undergraduate female identifying students and 911 undergraduate male identifying students enrolling in the fall of 2019 (Bellarmine University Office of Institutional Research and Effectiveness), which is reflected in the participants of this study. Having the majority of participants in this study self-report that they are female (77.6%), white (86.3%), first-year or sophomore students (57%), and non-STEM majors (70.4%), the results of this study are limited, and only possibly representative of other groups of individuals who attend a similar small university, and are mostly female, white, first-years or sophomores, and non-STEM majors; there can be no great inferences made on groups that do not resemble these statistics, and all results are biased and unique to Bellarmine University. Results are not generalizable to other college students, or the general public.

Furthermore, because the majority of this population is female-identifying and feminine, the functions of feminine characteristics may work differently at a liberal arts school, such as Bellarmine, that has a majority female population. Future research in this area would do well to widen the sample size and type of participants within the study.

Although it is important to narrow the focus of an undergraduate thesis project as much as possible, so as to not become overwhelmed with the reinvention of the wheel but to keep things manageable for its respective undergraduate, I would like to recognize that the inclusion of race and ethnicity within this subject matter is undoubtedly invaluable. In order to make this thesis more focused and concise, the focus was kept on gender. Although, race and ethnicity, as well as other personal variables, are important to keep in mind. The intersectionality of gender, race, and ethnicity as it impacts a student's college experience should continue to be researched in the future.

Race and ethnicity of the participants were measured using self-report. The two were separated, and there were several diverse responses to the question of ethnicity. These nuances (in responses to race and, more specifically, ethnicity) made it difficult to study race and ethnicity in-depth, though it is valuable to be aware that the majority of these participants identify as white individuals. Also, a handful of individuals gave responses that did not make sense and likely were not relevant to the study. Many participants seemed to understand ethnicity as ancestry. I recommend that future researchers study social support, self-efficacy, and academic outcomes as they relate to culture and ethnicity as a qualitative and in-depth study on its own, in order to better capture the experiences of students as they relate to the intersectionality of race, ethnicity, and gender (among other things). Race undoubtedly is a factor

in this study, and as a majorly white university, the preliminary results of this study are unique and do not cover a wide range of experiences.

Other demographic information that is valuable to consider within this thesis is the characteristics of the professors of the students who completed this survey. This information is only available to us because participants were incentivized with extra credit. Participants, after completing the main Google Forms survey, were redirected to another Google Form, entitled “Extra Credit Only Form,” where they could report their own name and the name of the professor who will give them extra credit for completing the survey. Names were kept separate from the main Google Forms document and timestamps were deleted off the “Extra Credit Only Form,” ensuring that the anonymity of all participants was kept secure and that their name could not be linked with their survey response. The names of the approximately 174 (some students submitted their name twice for extra credit), out of the 223 total, participants requesting extra credit were organized by professor.

Once able to organize participant and professor names, it was quickly realized that the majority of all faculty of the respondents to this survey were female. This includes STEM professors; there were 6 female non-STEM professors reported, 1 male non-STEM professor (who does not teach at Bellarmine University), 1 female STEM professor (with 12 students reporting her name), and 2 male STEM professors (with only 5 students reporting their names). Although these numbers are small, it is important to note that the majority of participants have a female professor, who likely plays an important role in their academic life as they were convinced to complete my survey when provoked (with extra credit) by these professors. With this knowledge, student-faculty interactions may be perceived and function differently at Bellarmine. Future research should try to compare the interactions with male and female



professors, perhaps at a school that is more evenly distributed in its gender, and consider asking participants the gender of their primary advisor, or another professor that has made a profound impact and holds an important role in their schooling. This can also be said about race.

Though peer support and faculty support are two prominent important types of support that college students receive, as supported by these preliminary results and prior research (Dennis et al., 2005; Kendricks et al., 2013), support is present in other ways, including parents and significant others. Future research would do well to examine these other types of social support, and how they impact academic outcomes. Further, although socioeconomic status was controlled for within this study, future research would do well to examine the impacts of both socioeconomic status and level of family education. The financial component of education is a roadblock for many. Family education as well may impact the level of support that a family can effectively give to a college student (McCallen and Johnson, 2019). Future research as well should also ask the student about who, if anyone, depends on them – if the student is caring for a parent of a child, for example.

College students are not all young adults or older teenagers, and there is no typical college experience. Keeping this in mind, future studies should measure age and differences of the impact of social support among ages. In this study, we did not ask for specific ages, although this would be an interesting variable with great impact, and an interesting additional variable to consider. Additionally, many individuals choose their major based on the ways in which they are shaped prior to college, so it would be beneficial to consider specifically younger students in a study like this as well. Further, I think that it would be beneficial to target individuals who originally come into college undecided of their major, and how they come to eventually choose and stick with their major(s). Another variable that would be interesting is resiliency. Although

we acknowledge that resiliency is important to have as a college student and is present when we have social support (see Zimmerman, 2013), the present study did not measure resiliency in its participants. Future research should make a point of investigating the relationship between social support and resiliency in a college environment, and its potential impacts on academic achievement as well as how our social identities (for this argument, including personality) impact the necessity of resilience.

Future research would do well to explore difference in classes, as well as to get into the details of individuals who come with enough college credits that they may only need to attend their college (or university) for two years. Our findings may have been more significant with seniors (who have been at their university for already 3 years), as first-years are still adjusting to college and finding their social support networks, as well as still stumbling to find a major, and may not have a lot of self-efficacy and may feel as though they have not developed academically or intellectually very much. Furthermore, this study design would be beneficial if used as a longitudinal study that followed the same group of first-years throughout their college experience, to graduation. It is difficult for first-years to know how they feel about their choice in university and their social support networks as they find their way; a strength of this study was waiting for the spring semester to send our survey out, giving first-year students more time to figure some things out, though it gave us less time to complete this thesis. This is an extension of the idea of persistence, within major, being correlated with social support. Analyzing persistence within a major overtime, as Hughes (2018) did, with social support, would be beneficial.

Personality likely has a large impact on the ways in which we go about school (Kertechian, 2018). Personality influences the ways that others perceive us, and how we perceive ourselves and others. In this thesis, certain aspects of personality were measured (need for

approval, introversion, and conscientiousness), though they were not thoroughly analyzed.

Future research should make a point of analyzing the impact of personality within school, and how it impacts our social support, self-efficacy, and our academic outcomes. Do individuals who are introverted have social support networks? Does having social support networks matter to introverts as much as they may matter to extraverts? How do they differ from the social support networks of individuals who are extraverted? How does social anxiety play into our perceived social support? There are many questions that should be investigated with future research.

Due to the timing of data collection and data analysis, with data collection beginning January 31<sup>st</sup>, 2020 and ending March 16<sup>th</sup>, 2020 and data analysis beginning soon after, coinciding with the coronavirus pandemic, there was limited time and difficult circumstances under which this thesis could be completed. There were limited responses to the survey as well, as I imagine it fell off of students' to-do lists as they came to grapple with the pandemic. Additionally, all results presented are only preliminary, and need to be explored further. With limited time and awkward phone meetings, data was not as thoroughly analyzed as was hoped for this thesis. In addition to data collection and analysis, the writing of this thesis was completed under stress and limited time, and may be more rushed than it originally would have been. Another limitation is the possibility of human error, of overlooking or incorrectly analyzing or coding data. This thesis is far from being comprehensive or concise.

Although the usage of the BSRI is still debated, some researchers in psychology still rely on it within their studies, beyond the female/male dichotomy (see Stoet, 2019). It is important to acknowledge that the BSRI was created in the 1970s, over 40 years ago. Many things within our society have changed since the 70's, and it is appropriate to assume that general perceived gender roles and how we view gender expression has greatly evolved since then, as the number

of women with a Bachelor's degree has considerably risen (United States Census Bureau, as cited in [https://www.census.gov/newsroom/pdf/women\\_workforce\\_slides.pdf](https://www.census.gov/newsroom/pdf/women_workforce_slides.pdf)), and women's roles have changed. What was considered to be feminine, masculine, or neutral in the 1970s may not be considered to be the same today. Further, because we did not want to give participants the full 60-item BSRI, we used a short-form of the BSRI (Bem 1981, as cited by Choi et al., 2009). While the idea and format of the BSRI is useful for beginning the discussion on gender measurements, the field of psychology is in desperate need of new measures of gender that do not include possibly severely outdated and inappropriate terminology used to describe femininity and masculinity (see Fraser, 2018), and must be keen to acknowledge the work of sociologists and other researchers who are investigating gender measures. Future studies should be attentive to gender and be open to testing any new measures of gender expression (newer than the BSRI) that are informed by both psychological and sociological research. Future studies should also make a point of examining gender expression among individuals who do not self-identify as male or as female. We were unable to within this study due to the small number of individuals who did not self-identify as male or female.

In this study, we did not consider psychology to be part of STEM. Generally, some individuals may while others may not. For example, some universities have the psychology department within the academic domain of the sciences along with math, physics, and chemistry. Some researchers include psychology majors in their consideration as STEM majors (e.g., Thiry et al., 2011). For the purposes of this study, as many respondents were psychology majors, considering psychology as a STEM major may have drastically altered the preliminary results. Furthermore, other universities may have more majors that are considered STEM, and other researchers may have considered more Bellarmine majors to be STEM than we did. Future

research should carefully discuss the differences among STEM and non-STEM majors and careers. Mixtures of STEM and non-STEM double majors and majors/minors were recorded, though not closely examined in this study, and future researchers would do well to examine these mixtures more closely. I would also like to make the point that while STEM careers are extremely valuable, we must as a society begin to shift towards acknowledging the importance of other careers that are not STEM.

There are many valuable careers within this world, though they pay less than STEM careers. This may be due to the gender roles that are associated with these careers. An example of this is teachers. Teachers are vital to society, nourishing and guiding everyone's minds as they grow. Without teachers, society would quickly fall apart. But, due to perceived gender roles, there is a pay gap and teachers are not paid much at all. Teaching is seen as something simple, and often as a job only meant for women. The pay gap partially exists due to the different careers that different sexes believe are available to them. Future researchers should explore other majors that are not divided into STEM and non-STEM categories, possibly focusing on humanities, as well as use qualitative data and ask why individuals chose their major/career. It may be because of the perceived opportunities to make a direct impact in a person's life, and females (again with perceived gender roles) may not see STEM as being that. This also may explain why women in STEM are most often in health-related jobs; these jobs, like teachers, fill the role of caretaker that is traditionally feminine.

In growing the research on why students choose to go into certain fields or not and why people generally make the choices that they do, it is important to understand the points of views of the person making the decision. This study did begin to explore how peers and faculty influence choice, with plans to investigate need for approval and personality. However, it may be

advantageous to ask participants in future studies directly if they enjoy their major choice, if they wish they could change their major, and generally why exactly they chose to be in their major. It is difficult to measure why any person makes any choice. It is likely that there are not many women or people of color in STEM fields because of the society that we live in, which controls interest and passion.

Future research would do well to continue to explore and create more modern measures of gender. It is important that researchers capture the relevant experiences of their participants as best as they can, as these experiences influence the responses of participants. Future researchers must ensure that they are careful with the usage of gender expression, gender identity, and sex. These are each distinct pieces of a person, no matter if they are part of the LGBTQ+ community or not. It is a little awkward for us to have compared gender expression and gender identity in these ways, as each have their own importance, though it is vital that we recognize that gender is shifting from the traditional ways that we know it. It is not sufficient to only give the options of “male,” “female,” and “other.” Non-traditional gender language is slowly becoming the norm within our modern world (see Fraser, 2018), and research that aims to describe the human experience (psychology) must adjust to accommodate this. Answers to self-report questions will slowly become intricate, and psychologists must be able to study all intricacies of them. Additionally, future research should make a point of attempting to examine the experiences and points of view of individuals who self-identify as androgynous, gender neutral, or gender queer. There were only 10 individuals who identified as such or similarly, as “other” than self-identified female or self-identified male, within this study, making it difficult to have conclusive results; we had to focus on the female/male self-identity dichotomy, which turned out to be useful to comparing self-identified gender with gender expression in the BSRI.

There is much more to examine within these research questions that I have posed, and within the data that has been collected. For example, there were several individuals who double-majored within a STEM and non-STEM major, that may have not been closely analyzed. Additionally, we asked each participant for their year in school not only for demographic purposes in order to describe the population, but also to further investigate the differences among social support, self-efficacy, and academic and intellectual development between class levels.

Each demographic variable that was used for this study should be further explored. Residential status, sources of social support, family education level, socioeconomic status, race, ethnicity, personality, first-generation status, gender, overall GPA, major GPA, major retention, the combination of STEM and non-STEM majors, and more variables are all unique to each college student and must be addressed in some way. This thesis has contributed to the field in identifying and collecting pertinent data that may be analyzed at a later date. Right now, these variables only function as descriptor variables. This study did focus mainly on quantitative data, and future research would do well to take the time to collect more qualitative data in order to get a better and deeper understanding of social support, self-efficacy, academic outcomes, gender, and major.

These questions are big, simply put. There are many variables to consider. The future research surrounding major choice and gender will likely never stop, though we should not be discouraged in our attempts to understand one another's experiences as they impact our lives. Overall, there are webs of variables, that should be tested in many different ways, that influence our lives. The SCCT web (Lent et al., 1994; 2000; as cited by Lent et al., 2005) is a good beginning. But each time we are aware of a new part of the web, we have done something significant. With my thesis, we have begun to support that social support and self-efficacy and

large parts of the web, and that gender roles play a large part in our social support, self-efficacy within different areas, and our college major and career decisions and choice in persistence. Gender roles, identity, and expression influence us, and are separate from sex and must be recognized as so.

### **Personal Reflection on the Thesis Process**

Due to the nature of this thesis process, I would like to take a moment to reflect upon it. This thesis process, as I am sure is the case for all others, was not without its ups and downs. Throughout this process, I had to learn to take a step back and narrow my focus onto specific topics, and limit the part of myself that gets too ambitious. This limiting was a good thing for me. Additionally, throughout many setbacks, we did not begin data collection until January 31<sup>st</sup> of 2020. Bellarmine University canceled all in person classes and events beginning March 12<sup>th</sup>, and my survey closed around March 16<sup>th</sup>. Analyzing data and discussing the direction of this thesis was difficult to do digitally, while simultaneously grappling with the effects of the pandemic. This was a balancing act that I would not wish upon anyone.

As I stated previously, the data collection, data analysis, and the completion of the writing of this thesis were all completed under great time restraints, as well as under great personal distress. I think I can say that this applies to most seniors attempting to complete a thesis, as well as their primary advisors and readers. My primary advisor, Dr. Wolfe, I know has had to balance many things throughout this process. Despite having to act as an elementary school teacher to her two young kids and teaching several online classes at Bellarmine (including the psychology research methods class, which is a lot to do in person let alone online), has continued to push me every step of the way. There are countless times where I wanted to give up on this project or felt that this project had no clear direction. Every time Dr. Wolfe was able to



push me to go a bit further; this thesis was completed with baby steps that Dr. Wolfe pushed every ounce of. Without Dr. Wolfe, this thesis would not have ever even come close to completion. It has been an honor to work so closely with such a kind, intelligent, dedicated, passionate, understanding, calming, and simply amazing advisor such as Dr. Wolfe. Thank you, Dr. Wolfe!!!

Throughout this thesis process, I have had to be pushed to let go of my own perfectionism. As I personally have grown throughout my senior year at Bellarmine, I have had to attempt to let go of many things that do not serve me and the goals that I have. This has been difficult, and there is still work to be done, but being placed within a corner with this thesis in which my only option to complete it is to have it be a little messy and imperfect has actually been good for me. Learning to let go and to trust myself and the process made this process go more smoothly, as this I associate with the ability to go with the flow. With this thesis, I quickly learned that I cannot stubbornly hang on to my original plans. I must recognize what works, and learn to let go of what does not work and what clouds my view. There are several threads that I can pull on within this subject matter, which I feel are partially shown through the discussion section of this thesis, but I had to focus on select things. The result of this thesis is not exactly what I had planned, and is only preliminary, and constantly shifted throughout these three semesters. But I think I ended up with a unique result. Maybe I can revisit the data that was collected because of this thesis eventually, and maybe allow myself the time to pick it to death, but for now I must focus on the good. And that is a good thing.

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**Appendix A****Survey Form for the Present Study**

Social Support in Academia

Undergraduate Honors Thesis Project

## Informed Consent

January 31st 2020 - March 2020

Dear Participant:

You are being invited to complete the attached questionnaires about peer support and faculty support, and how peer and faculty support is associated with academic success in college students. There are no reasonably foreseeable risks associated with your participation in this study. Your participation may or may not benefit you directly. However, the information learned in this study may be helpful to others. The data you provide will be used for an undergraduate honors thesis research project. The questionnaires will take approximately 30 minutes to complete. Your completed questionnaires will be stored online at Bellarmine University. Individuals from the Bellarmine Psychology Department and the Bellarmine University Institutional Review Board may inspect these records. In all other respects, however, the data will be held in confidence to the extent permitted by law. Your participation and survey responses will be completely anonymous.

Please remember that your participation in this study is voluntary. By completing and submitting the attached questionnaires, you are voluntarily agreeing to participate. You are free to decline to answer any particular question that may make you feel uncomfortable or which may render you prosecutable under law.

You acknowledge that all your present questions have been answered in language you can understand. If you have any questions about the study, please contact Dr. Christy Wolfe ([cwolfe@bellarmine.edu](mailto:cwolfe@bellarmine.edu)) or Kasey Phelps ([kphelps@bellarmine.edu](mailto:kphelps@bellarmine.edu)). If you have any questions about your rights as a research subject, you may call the Institutional Review Board (IRB) office at 502-272-8032. You will be given the opportunity to discuss any questions about your rights as a research subject, in confidence, with a member of the committee. This is an independent committee composed of members of the University community and lay members of the community not connected with this institution. The IRB has reviewed this study.

Sincerely,

Dr. Christy Wolfe &amp; Kasey Phelps

I have read the informed consent and am over the age of 18.\* (\*Required an answer)

\_Yes\_No

**Peer-Group Interactions**

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select the "1" if you Strongly Disagree

Select the "2" if you Disagree

Select the "3" if you are Neutral

Select the "4" if you Agree

Select the "5" if you Strongly Agree

- Since coming to this university I have developed close personal relationships with other students.
- The student friendships I have developed at this university have been personally satisfying.
- My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes, and values.
- My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas.
- It has been difficult for me to meet and make friends with other students.
- Few of the students I know would be willing to listen to me and help me if I had a personal problem.
- Most students at this university have values and attitudes different from my own.

**Interactions with Faculty**

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select the "1" if you Strongly Disagree

Select the "2" if you Disagree

Select the "3" if you are Neutral

Select the "4" if you Agree

Select the "5" if you Strongly Agree

- My non-classroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes.
- My non-classroom interactions with faculty have had a positive influence on my intellectual growth and interest in ideas.

- My non-classroom interactions with faculty have had a positive influence on my career goals and aspirations.
- Since coming to this university I have developed a close, personal relationship with at least one faculty member.
- I am satisfied with the opportunities to meet and interact informally with faculty members.

### **Faculty Concern for Student Development and Teaching**

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select the "1" if you Strongly Disagree

Select the "2" if you Disagree

Select the "3" if you are Neutral

Select the "4" if you Agree

Select the "5" if you Strongly Agree

- Few of the faculty members I have had contact with are generally interested in students.
- Few of the faculty members I have had contact with are generally outstanding or superior teachers.
- Few of the faculty members I have had contact with are willing to spend time outside of class to discuss issues of interest and importance to students.
- Most of the faculty members I have had contact with are interested in helping students grow in more than just academic areas.
- Most faculty members I have had contact with are genuinely interested in teaching.

### **Academic and Intellectual Development**

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select the "1" if you Strongly Disagree

Select the "2" if you Disagree

Select the "3" if you are Neutral

Select the "4" if you Agree

Select the "5" if you Strongly Agree

- I am satisfied with the extent of my intellectual development since enrolling at this university.

- My academic experience has had a positive influence on my intellectual growth and interest in ideas.
- I am satisfied with my academic experience at this university.
- Few of my courses this year have been intellectually stimulating.
- My interest in ideas and intellectual matters has increased since coming to this university.
- I am more likely to attend a cultural event (i.e., concert, lecture, art show) now than I was before coming to this university.
- I have performed academically as well as I anticipated I would.

### **Institutional and Goal Commitments**

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select the "1" if you Strongly Disagree

Select the "2" if you Disagree

Select the "3" if you are Neutral

Select the "4" if you Agree

Select the "5" if you Strongly Agree

- I am confident that I made the right decision in choosing to attend this university.
- It is likely that I will register at this university next fall.
- It is important to me to graduate from this university.
- I have no idea at all what I want to major in.
- Getting good grades is not important to me.
- It is not important to me to graduate from this university.

### **Social Support**

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Select the "1" if you Very Strongly Disagree

Select the "2" if you Strongly Disagree

Select the "3" if you Mildly Disagree

Select the "4" if you are Neutral

Select the "5" if you Mildly Agree

Select the "6" if you Strongly Agree

Select the "7" if you Very Strongly Agree

- There is a special person who is around when I am in need.
- There is a special person with whom I can share my joys and sorrows.
- My family really tries to help me.
- I get the emotional help and support I need from my family.
- I have a special person who is a real source of comfort to me.
- My friends really try to help me.
- I can count on my friends when things go wrong.
- I can talk about problems with my family.
- I have friends with whom I can share my joys and sorrows.
- There is a special person in my life who cares about my feelings.
- My family is willing to help me make decisions.
- I can talk about my problems with my friends.

### **Self-Efficacy**

The following 20 items concern your confidence in various aspects of college. Using the scale below, please indicate how confident you are as a student (at Bellarmine University or your respective college) that you could successfully complete the following tasks. If you are extremely confident, mark a 10. If you are less confident, mark a 1. If you are more or less confident, find the number between 10 and 1 that best describes you.

Levels of confidence vary from person to person, and there are no right or wrong answers; just answer honestly.

- Make new friends at college.
- Divide chores with others you live with.
- Talk to university staff.
- Manage time effectively.
- Ask a question in class.
- Participate in class discussions.
- Get a date when you want one.
- Research a term paper.
- Do well on your exams.
- Join a student organization.
- Talk to your professors.
- Join an intramural sports team.
- Ask a professor a question.
- Take good class notes.
- Get along with others you live with.
- Divide space in your residence.
- Understand your textbooks.
- Keep up to date with your schoolwork.
- Write course papers.
- Socialize with others you live with.

**Grade Point Average**

What is your current overall GPA?

[Short answer text]

What is your current overall major GPA? (Your major GPA consists only of grades from classes that are required for your major.)

[Short answer text]

**Current Major**

What is your current major(s) (and minor(s), if applicable)?

[Short answer text]

Have you ever changed your major?

\_Yes

\_No

If yes, what previous major(s) did you have?

[Short answer text]

What is the likelihood that you will change your major in the future?

1 (Not Likely) to 5 (Very Likely)

**Demographic Data**

Please self-report your gender identity.

[Short answer text]

**Demographic Data**

For the following questions, please use the scale below to describe yourself as you generally are now, not as you wish to be in the future. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence.

With 1 being almost never true, 7 being almost always true, and 4 being neutral.

- I am assertive.
- I am understanding.
- I am sympathetic.

- I have leadership ability.
- I am dominant.
- I have a strong personality.
- I am eager to soothe hurt feelings.
- I am sensitive to the needs of others.
- I am compassionate.
- I am forceful.
- I love children.
- I am aggressive.
- I am affectionate.
- I am gentle.
- I am warm.
- I am willing to take a stand.
- I am tender.
- I am independent.
- I defend my own beliefs.
- I am willing to take risks.

**Demographic Data**

Do you attend Bellarmine University?

\_Yes

\_No

Please self-report your race.

[Short answer text]

Please self-report your ethnicity.

[Short answer text]

Are you a first-generation student? (First-generation refers to neither of your parents completing a 4-year college or university.)

\_Yes

\_No

Do you live on campus, or have you ever lived on campus?

\_Yes

\_No

Highest level of education represented in your household by your parents/guardians:

- Less than 12th grade

- High school graduate or the equivalent
- Some college credit, less than 1 year
- 1 or more years of college
- Associate's Degree
- Bachelor's Degree
- Master's Degree
- Professional School Degree
- Doctorate Degree

The approximate total income of your household earned by your parents/guardians:

- Less than \$20,000
- \$20,000 to \$34,999
- \$35,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- Over \$100,000

What year are you currently in?

- First-year student
- Sophomore
- Junior
- Senior

### **Personality**

For the following questions, please describe yourself as you generally are now, not as you wish to be in the future. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence.

Indicate for each statement whether it is:

1. Very Inaccurate
2. Moderately Inaccurate
3. Neither Accurate Nor Inaccurate
4. Moderately Accurate, or
5. Very Accurate

as a description of you.

- I am not concerned with making a good impression.
- I conform to others' opinions.
- I worry about what other people think of me.
- I need the approval of others.



- I don't care what others think.
- I want to amount to something special in others' eyes.
- I do what others do.
- I feel it's OK that some people don't like me.
- I want to form my own opinions.
- I want to be different from others.
- I try to please everyone.
- I follow directions.
- I do what others want me to do.
- I hate to seem pushy.
- I follow orders.
- I don't care what others think.
- I quickly recognize possibilities.
- I give in to no one.
- I want to be different from others.
- I believe only in myself.
- I am always prepared.
- I pay attention to details.
- I often forget to put things back in their proper place.
- I get chores done the right way.
- I like order.
- I leave my belongings around.
- I follow a schedule.
- I am exacting in my work.
- I make a mess of things.
- I shirk my duties.
- I want to be left alone.
- I prefer to do things by myself.
- I seek quiet.
- I can't do without the company of others.
- I don't mind eating alone.
- I enjoy silence.
- I enjoy my privacy.
- I enjoy being part of a group.
- I enjoy spending time by myself.
- I enjoy teamwork.

**Submit - Thank you!**

Thank you for completing this questionnaire on social support in academia.

Once you click submit, your answers will be recorded and will be kept confidential. On the next screen, there will be a link for a separate form if your Bellarmine professor is offering extra credit for the completion of this form.

If you feel you need to seek support, and attend Bellarmine University, please contact the Bellarmine University Counseling Center at 502.272.8480 Monday-Friday, 8 a.m.-5 p.m., or Campus Safety anytime at 502.272.7777.

Thank you for completing this survey! If you would like to include your name for extra-credit purposes, please click on the link below to take you to a separate document to record your name and professor's name. Your responses to this survey will stay separate and anonymous.

<https://forms.gle/WKDf4iLq9ur6qqPm7>

**Appendix B****Extra Credit Only Form**

Please enter your name and your professor's name for extra credit. This form is kept separate from the survey form to ensure that you stay anonymous. Thank you for completing my form!

What is your name?\*

[Short answer text]

What is your professor's name?\*

[Short answer text]

## Appendix C

### IRB Approval Letter

**From:** Francis T. Hutchins  
**Sent:** Tuesday, November 19, 2019 6:43 PM  
**To:** Christy D. Wolfe  
**Cc:** Connie R. Smith  
**Subject:** IRB #803

11/19/19  
Dr. Christy Wolfe  
Psychology Bellarmine University  
IRB #803, "Associations Between Peer Support and Academic Success"

Dr. Wolfe,

The IRB has received your application for the project entitled "Associations Between Peer Support and Academic Success." The project has been designated protocol #803. Your project is exempt. As always, the IRB expects full compliance with relevant policies and procedures inclusive of informed consent. If any issues emerge that may alter the protocol and/or an adverse event occurs, you are required to contact the IRB chair as soon as possible. If you have any questions, please feel free to contact me. We wish you the best with your project.

Regards,

Frank Hutchins, PhD  
Professor of Anthropology  
110A Pasteur Hall  
Bellarmine University  
2001 Newburg Road  
Louisville, KY 40205  
(502) 272-8393

**Appendix D****IRB Amendment Approval Letter**

(Addition of SES measures)

**From:** Francis T. Hutchins <fhutchins@bellarmine.edu>  
**Sent:** Thursday, January 23, 2020 11:53 AM  
**To:** Christy D. Wolfe <cwolfe@bellarmine.edu>  
**Cc:** Connie R. Smith <csmith6@bellarmine.edu>  
**Subject:** IRB #803

1/23/20  
Dr. Christy Wolfe  
Psychology Bellarmine University  
IRB #803, "Associations Between Peer Support and Academic Success"  
Dr. Wolfe,

Your study amendment request dated Jan. 16, 2020 was reviewed by a member of the Bellarmine University IRB. Under this amendment, you will be adding two items to your measurement of SES. You may proceed with this revised project. This study's review period now extends until Jan. 23, 2021. Please submit a study Termination Form if data collection is completed before that time. These documents are found at <http://www.bellarmine.edu/academicaffairs/effective/research-and-creativity/irb/>

Regards,

Frank Hutchins, PhD  
Professor of Anthropology  
110A Pasteur Hall  
Bellarmine University  
2001 Newburg Road  
Louisville, KY 40205  
(502) 272-8393