# The Impostor Phenomenon and Depression in Higher Education:

# The Moderating Roles of Perceived Social Support and Sense of Belonging

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# Abstract

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The study examined the impostor phenomenon among undergraduate and graduate students at a Predominantly White Institution (PWI). Participants were recruited from various undergraduate and graduate programs at a PWI located in Northeastern U.S. There were 414 participants, all of whom completed an online Qualtrics survey, which included measures on demographics, sense of belonging, impostor phenomenon, mindset, perceived social support, and depression. Results indicated a significantly positive relationship between impostor phenomenon and depression. Perceived social support and sense of belonging significantly moderated this relationship. Female and Other (Transgender, Non-Binary, and Non-Gender-Specified) participants experienced a significantly higher level of impostor feelings than Male participants. Asian and Other (African American, Hispanic, Latinx, Middle Eastern, Biracial, and Multiracial) participants experienced significantly lower levels of perceived social support than White participants, but did not experience significantly different levels of impostor phenomenon or sense of belonging compared to White participants. Lastly, there was no significant relationship between fixed mindset and impostor phenomenon. In light of these results, there are several recommendations for universities, including increasing the amount of support group

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# Dedication

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# Introduction

An increasing number of American students in higher education are experiencing mental health challenges, with depression being one of the most common (Center for Collegiate Mental Health, 2020; Evans et al., 2018). The average demand at college counseling centers grew at least five times faster than average institutional enrollments from 2009 to 2015 (Center for Collegiate Mental Health, 2020). This demand has resulted in lengthy wait times, as students have to wait on average almost seven business days for their first appointment (Association for University and College Counseling Center Directors, 2017). This is especially alarming because it creates a barrier for students with more severe mental health challenges to receive support, including those at high risk for suicide, which is one of the most common causes of death among college students (Turner et al., 2013). In fact, according to the Center for Disease Control and Prevention, from 2007 to 2017, the rate of suicide among 10- to 24-year-olds rose by 56% (Curtin & Heron, 2019).

Furthermore, some studies indicate that there may be significant differences between White and Non-White students in the rate of mental health symptoms, formal diagnoses, and treatment use. For instance, some found that Hispanic, Asian, and Multiracial students endorsed higher rates of depression symptoms than their White peers (Eisenberg et al., 2013). The higher rates of symptoms could be due to stressors like negative stereotypes, racial discrimination, lack of financial aid, employment during school, and lack of familiarity with higher education if they are first-generation college students (Bravata et al., 2019; Cokley et al., 2013; Ewing et al., 1996). However, of note, there have been inconsistencies in the results of studies that have examined the prevalence rates of mental health symptoms or diagnoses by race. As an example, a more recent large-scale study found that Non-White students self-reported the same or lower

rates of formal psychiatric diagnosis as their peers and that Asian/Pacific Islander and multi-racial students experienced higher rates of suicidal ideation and attempts (Chen et al., 2019).

Recent research also indicates that Non-White college students with mental health conditions appear to utilize treatment at much lower rates than White students (Herman et al., 2011; Lipson et al., 2018). The lower utilization and formal diagnosis rates could be due to a higher amount of mental health stigma evident within Non-White populations, such as among Asian American and African-American students. In summary, although some Non-White students appear to endorse a higher level of depression symptoms than their White peers and sometimes experience more suicidal ideation or attempts, they are less likely to seek treatment or receive a formal diagnosis.

Ultimately, there needs to be an improvement in the identification of students in higher education, especially Non-White students, at high risk for severe mental health problems, as well as provision of appropriate support. A better understanding of the predictors of students' mental health symptoms, especially depression, would inform such identification, prevention, and intervention. Although there are a variety of factors that potentially contribute to depression in undergraduate and graduate students, one that would benefit from increased attention in research is the "impostor phenomenon."

"Impostor phenomenon" (also referred to in the lay literature as "impostor syndrome," "impostorism," or "impostor feelings") is a term that was originally coined by psychologists Clance and Imes (1978). The term is used to describe high-achieving individuals who, despite evidence of their successes, persistently doubt themselves, do not internalize their accomplishments, believe they have deceived others about their intelligence, and fear being exposed as an impostor (Bernard et al., 2017; Bravata et al., 2019; Clance & Imes, 1978; Harvey

& Katz, 1985). These individuals tend to attribute their success to causes like error, happenstance, or hard work (Cokley et al., 2013). In addition, the impostor phenomenon has been linked to high perfectionism and low self-esteem as well as significant mental health symptoms such as anxiety and depression (Austin et al., 2009; Bernard et al., 2017; Bravata et al., 2019; Cokley et al., 2013; Cusack et al., 2013; McClain et al., 2016; McGregor et al., 2008; Sonnak & Towell, 2001; Thompson, 1998).

Originally, impostorism was identified as a phenomenon among high-achieving professional women (Clance & Imes, 1978). This was hypothesized to be due to early family dynamics as well as the later introjection of societal sex-role stereotypes (Langford & Clance, 1993). However, research since the seminal work by Clance and Imes (1978) has demonstrated that impostor feelings are experienced by both men and women. Of note, there is inconsistency regarding whether there are significant differences in impostor feelings according to gender, suggesting that more research needs to be done in this area. Some studies have found that women report higher rates of impostor feelings than men (Cohen & McConnell, 2019; Cusack et al., 2013; Henning et al., 1998; King & Cooley, 1995; Kumar & Jagacinski, 2006; McGregor et al., 2008) while others have found no significant gender differences (Bernard et al., 2002; Bravata et al., 2019; Cozzareli & Major, 1990; Langford & Clance, 1993; Thompson, 1998).

In addition, studies have found that the impostor phenomenon impacts students from a variety of ethnic/racial groups (Bernard et. al., 2017; Bravata et al., 2019). For example, studies have demonstrated the prevalence of the impostor phenomenon amongst African American undergraduate and graduate students (Austin et al., 2009; Cokley et al., 2013; Ewing et al., 1996; Lige et al., 2017; Peteet et al., 2014) as well as Asian American and Latinx American undergraduate students (Cokley et al., 2013; Wei et al., 2020). Many of these studies examined

the relationship between impostor feelings and mental health within minority student populations. For instance, McClain et al. (2016) found that impostor feelings and minority status stress were negative predictors of mental health amongst African American undergraduate and graduate students. Peteet et al. (2014) found that higher impostorism was associated with higher psychological stress for these students. In addition, Cokley et al. (2012) found that the impostor phenomenon status was a better predictor of mental health than minority status stress across multiple ethnic minority groups of undergraduates including Asian American, African American, and Latinx American students.

Only Austin et al. (2009) and Bernard et al. (2017)'s studies presented findings on depression symptoms, while others focused on overall mental health or psychological distress. When examining African American undergraduate students, Austin et al. (2009) found that impostor feelings significantly predicted depression. Bernard et al. (2017) examined the longitudinal relationship between impostor feelings and mental health functioning, with racial discrimination and gender as moderators, in a sample of African American female college students and found that impostor feelings were associated with higher levels of depressive symptoms for African American women who experienced high levels of racial discrimination.

Furthermore, when examining the overall literature, only a few studies have examined the relationship between the impostor phenomenon and mental health and/or included multi-ethnic samples. Given the high number of college students, including minority students, that experience mental health challenges such as depression, more research must be done to examine the impostor phenomenon as a predictor of mental health within both White and Non-White student populations.

It would also be beneficial to better understand the moderating factors that influence the relationship between the impostor phenomenon and mental health symptoms, especially depression. This knowledge might aid the creation of effective interventions to help students cope with impostor feelings. Such interventions may help prevent impostorism from leading to severely negative effects on students' mental health and prevent engagement in suicidal ideation or attempts. However, research is very limited regarding such mechanisms. Most studies in the field have focused on the relationship of gender to impostor feelings rather than trying to understand how students can effectively cope with these feelings (Hutchins & Rainbolt, 2017).

Despite this scarcity, one factor that some researchers suggest plays a moderating role in coping with the emotional exhaustion associated with impostor feelings is perceived social support (Whitman & Shanine, 2012). Research has also indicated that higher perceived social support is associated with positive psychological well-being and lower levels of depression (Alsubaie et al., 2019; Zhou et al., 2013). Generally, social support can be defined as "the existence or availability of people on whom we can rely, people who let us know that they care about, value, and love us" and perceived social support is the belief that if needed, help is available (Zhou et al., 2013). Furthermore, some studies have found that there may be differences in the level of social support experienced by students based on their racial groups, for example, that Asian and multi-racial students may experience lower quality social support than their White peers (Hefner & Eisenberg, 2009). Other studies have compared African-American students attending a Historically Black College and University (HBCU) and a Predominantly White Institution (PWI) and found that students who attended a PWI reported that they experienced lower amounts of social support compared to their White peers, as well as compared to African-American students attending a HBCU (Negga et al., 2007).

Results of studies that have examined the relationship between the impostor phenomenon and perceived social support have been variable. Some found that all sources of perceived social support are beneficial to mitigating the impostor phenomenon, while others found that some sources are more helpful than others. Sources of social support investigated in research include support from within the program/major such as classmates and professors as well as from outside the program such as friends, family, and significant others. For example, Cohen and McConnell (2019) examined the impostor phenomenon amongst graduate school students in a variety of fields and found that students who reported above-average perceived social support from friends and family had lower impostor scores than their peers. They also found that increased perceived isolation from students and faculty was linked to significantly higher impostor scores, when controlling for social support from outside the program.

Gardner et al. (2018) found that it may be important to examine the source of social support when trying to better understand the association between impostor feelings and social support. In particular, past research has suggested the possibility that support from peers within an organization may increase impostor feelings due to fear of exposure of deficiencies or negative peer-self comparisons. When examining college students from an accounting program, Gardner et al. (2018) found that compared to seeking support from classmates inside their program, seeking social support from people outside of the program peer group (e.g., friends, family, and significant others) seemed to be more effective in decreasing perceptions of impostorism.

Overall, based on the aforementioned studies, past research has indicated a possible relationship among impostor phenomenon, perceived social support from a variety of sources, and mental health. However, none have quantitatively examined the moderating role of

perceived social support in the relationship between impostor feelings and depression, or examined how this relationship might differ by race. This seems integral to understanding how to most effectively help students cope with these feelings and prevent severe negative impacts on mental health.

Another concept, "sense of belonging," has yet to be extensively studied in relation to the impostor phenomenon. This concept has been ambiguously defined in the literature (Tovar et al., 2009). This is particularly the case with research in higher education. Goodenow (1993) defined "sense of belonging" as "the extent to which students feel personally accepted, respected, included and supported by others in the school social environment."

A strong sense of belonging has been tied to many life outcomes, such as positive psychological well-being (Kawachi & Berkman, 2001) and lower symptoms of depression in various samples, including college students. A study conducted with a sample of first-generation college students found that sense of belonging negatively predicted the frequency that students reported feeling stressed, depressed, or upset (Stebleton et al., 2014). Johnson et al. (2007) found that African American, Asian, and Hispanic undergraduate students experienced a weaker sense of belonging than Caucasian students. Among a group of undergraduate STEM majors, Rainey et al. (2010) found that students of color were significantly less likely to report a sense of belonging than White students. Graham and McClain (2019) found that for a sample of African American undergraduate students, impostor feelings were negatively correlated with belongingness in school. Limited evidence from a qualitative study by Gardner and Holley (2011) found that first-generation graduate students who felt as if they didn't belong were more likely to show signs of impostorism. Another qualitative study by Posselt (2018) found that for female and African-American, Latinx, and Native American doctoral students, the existence of impostor feelings in

combination with the school's intellectual rigor, and experiences with racism and sexism, led them to question their belongingness. However, even though past studies have found relationships between the impostor phenomenon and sense of belonging, and sense of belonging and mental health, no quantitative studies have examined the role of sense of belonging on campus as a moderator between impostor phenomenon and depression in students in higher education, or how this relationship might differ by race.

Furthermore, only a few studies have examined the relationship between "fixed mindset" and impostor phenomenon. A fixed mindset is the belief that abilities cannot be developed over time, compared to a growth mindset, which refers to the belief that abilities can be developed over time (Dweck &Yeager, 2019). Noskeau et al. (2021) found that for a sample of working professionals, those with a fixed mindset experienced more impostor feelings while Kumar and Jacgacinski (2006) found that for female college students, a fixed mindset was significantly associated with impostor feelings. However, this relationship did not appear significant for male college students. This relationship would be important to investigate further because of the efficacy of mindset interventions and the potential for such interventions in also decreasing impostor feelings if there is indeed a significant relationship between the variables.

Ultimately, to date, there have been several areas within the field of impostor phenomenon research that have not been given much attention. Firstly, few studies have analyzed differences in the prevalence of impostor feelings amongst undergraduate and graduate students from a variety of racial groups, including samples of both White and Non-White students, as well as other demographic groups, such as socioeconomic status, first-generation status, major, and year of study (Cokley et al., 2013; MacInnis et al., 2019; Peteet et al., 2017; Sonnak & Towell, 2001). Only two have examined the relationship between the impostor

phenomenon and mindset. Furthermore, few studies have examined the mechanisms through which the impostor phenomenon impacts depression. Specifically, none have examined the moderating role that perceived social support or sense of belonging may play in the relationship between the impostor phenomenon and depression, or how these relationships might differ by race.

However, this knowledge may be important to determining effective coping interventions and preventing severe effects on mental health. For example, if research indicates that sense of belonging on campus does play a significant mediation role, perhaps researchers could create and examine the effectiveness of modified versions of brief sense of belonging interventions, such as those created by Walton and Cohen (2011). These have shown improvement in academic, health, and well-being outcomes for minority college students. Another possible recommendation that could be investigated if perceived social support was a successful moderator, would be increased social support through specific support groups for students that are experiencing the impostor phenomenon, similar to what was suggested originally by Clance and Imes in 1978.

Keeping in mind the limitations found in the literature, this dissertation will be unique in several ways. The participant population will include both White and Non-White undergraduate and graduate students attending a highly selective and predominantly White institution (PWI) in the Northeast. Furthermore, previously established and highly reliable and valid measures of perceived social support, sense of belonging, mindset, and depression will be administered, instead of researcher-created measures or broad mental health measures.

This dissertation has several goals. The first is to examine differences in the level of impostor feelings according to gender and differences in impostor feelings, perceived social support, and sense of belonging according to race. Another goal will be to examine the potential

moderating roles of perceived social support and sense of belonging between the impostor phenomenon and depression. Furthermore, another goal will be to examine the impact of race on these moderating relationships, to see if there are racial differences in those relationships. The last goal will be to examine the relationship between impostor phenomenon and depression as well as fixed mindset. The participants of this study will include White and Non-White undergraduate and graduate students attending Columbia University. The current study will be non-experimental in design. All participants will complete a brief demographic measure along with measures on impostor phenomenon, perceived social support, sense of belonging, mindset, and depression.

# Chapter 1: Review of Literature

There has been a rise in the number of American undergraduate students experiencing mental health challenges (Center for Collegiate Mental Health, 2020). Furthermore, a recent study examining graduate students across twenty-six countries found that compared to the general population, graduate students were six times more likely to experience depression and anxiety (Evans et al., 2018). However, despite these increases, counseling centers are often unable to contend with the high demand for services, and wait times for first appointments can be lengthy (Association for University and College Counseling Center Directors, 2017; Center for Collegiate Mental Health, 2020). This is alarming, given that those with severe mental health problems, including those at high risk for suicide, may not be able to access necessary intervention.

## Depression: Background

One of the most common mental health challenges among American undergraduate and graduate students is depression. It has been associated with many negative outcomes, including low academic performance, self-harm behavior, and a higher risk of attempting or committing suicide (Ebert et al., 2018; Eisenberg et al., 2013; Mackenzie et al., 2011). Thus, it is no surprise that the rates of suicide amongst individuals aged 10 to 24 years old increased by 56% between 2007 to 2017 (Turner et al., 2013). Suicide is one of the most common causes of death among college students (Curtin & Heron, 2019).

According to the Diagnostic and Statistical Manual Mental Disorders (DSM-5), five specific criteria need to be met before Major Depressive Disorder can be formally diagnosed (American Psychiatric Association, 2013). Firstly, five or more symptoms must be present within the same two-week time frame. These symptoms include but are not limited to significant

weight loss or weight gain, insomnia or hypersomnia, psychomotor agitation or retardation nearly every day, and fatigue or loss of energy nearly every day (American Psychiatric Association, 2013). At least one of the symptoms should be either loss of interest/pleasure or depressed mood.

In addition, these symptoms have to result in clinically significant levels of distress or impairment within important areas of functioning, such as social or occupational areas. The depressive episode should not be due to physiological effects from a substance or a different medical condition. Moreover, the episode should not be better explained by psychotic disorders such as schizophrenia, delusional disorders, etc. and there should be no evidence of a manic or hypomanic episode.

***Depression and Racial Factors***

The level of depression symptoms may differ between White and Non-White college students, according to the large-scale Healthy Minds study, conducted by Eisenberg et al. (2013). Researchers measured college students' symptoms through the Patient Health Questionnaire and found that Non-White students experienced a higher level of depression symptoms than their White peers. Lipson et al. (2018) also examined undergraduate and graduate students' responses on the Healthy Minds study and found that only 21% of African American students who had a mental health problem received a diagnosis compared to 48% of White students. These disparities could be due to racial discrimination, negative stereotypes, lack of financial aid, employment during school, and lack of familiarity with higher education if they are first-generation college students (Bravata et al., 2019; Cokley et al., 2013; Ewing et al., 1996).

Chen et al. (2019) conducted a large-scale study with U.S. college students and found that Asian/Pacific Islander and multi-racial students more frequently engaged in behaviors like

suicidal ideation and attempts in comparison to their White peers. Researchers also found that Black and Hispanic students had a lower rate of psychiatric diagnoses than their White peers but the same rate of suicide attempts. One explanation for this could be that Non-White students are less likely to seek treatment than their White peers (Herman et al., 2011; Lipson et al., 2018), possibly due to stigma or racial discrimination (Augsberger et al., 2015; Chen et al., 2019; Lipson et al., 2018). Thus, without seeking treatment, these students would not be able to receive formal diagnoses.

Overall, the literature suggests that although some Non-White students in higher education appear to endorse a higher level of depressive symptoms than their White peers and sometimes experience more suicidal ideation or attempts, they are less likely to seek treatment or receive a formal psychiatric diagnosis. Considering the prevalence rates of mental health challenges like depression among college students, especially Non-White students, these areas need to be better understood. Several avenues of research could be explored to examine this. For instance, to identify students who are at high risk for severe mental health problems, such as depression, research could determine the most appropriate predictors of mental health (Austin et al., 2009). Since therapeutic intervention may not be easily accessible for all students, especially those from racial or ethnic minority backgrounds (due to high demand, racial discrimination, or stigma), these predictors could then be measured and utilized to inform appropriate preventative services (like workshops, programs, etc.) and alternative interventions (like support groups).

### *Mental Illness and Academic Context*

Research has shown that there may be higher levels of stigma on elite academic campuses, enhanced by the pressure of perfection and the promotion of individual agency (Billings, 2021). This perfectionism has also been evident on honors college campuses, whereby

these students have higher personal standards and impostor phenomenon than their general education peers (Cross et al. 2018; Lee et al., 2021). “Duck Syndrome” refers to the idea that individuals are like ducks paddling frenziedly underwater, while above water they seem to glide without putting in a lot of work; researchers have speculated that this may cause students to hide their mental illness, isolate themselves, and thereby increase their risk of suicide (Billings, 2021).

Specifically, Billings (2021) found that lower-status students at Ivy-League Universities had higher personal mental illness stigma than lower-status students at Non-Ivy League Universities. It was speculated that students of lower status at elite colleges may become socialized to adopt values that are more individualistic in nature due to their college context, which may then enhance their mental illness stigma.

There are also possible differences in the experience of psychological distress in Predominantly White Institutions, particularly between Non-White and White students. In a study examining African American and Caucasian undergraduate students attending a Predominantly White Institution, it was found that race was a significant moderator between stress and resilient coping (Oliver et al., 2019). African American students appeared to use more resilient coping strategies than Caucasian students. However, African American students did not experience significantly higher levels of stress than Caucasian students.

### *Mental Illness and Gender Factors*

Few studies have also examined differences in prevalence rates of mental illness based on gender. Lipson et al. (2019) conducted the largest population-level study in relation to this and researchers in the study analyzed data from undergraduate and graduate students who completed the Healthy Minds Study. Symptoms of depression were examined through the Patient Health Questionnaire (PHQ-9). It was found that 78% of students that identified as a gender minority

(transgender, gender queer, other self-identified gender) met criteria for one or more mental health problems, compared to 45% of cisgender students, and 58% of gender minority students were positive for depression (Lipson et al., 2019). Oswalt and Lederer (2017) also found that transgender college students experienced twice the risk for many mental health problems and seven times the risk for schizophrenia compared to cisgender female students. Overall, findings highlight the need to address these issues on college campuses and increase support for gender minority students.

**Impostor Phenomenon: Background**

One predictor of mental health that has not been researched as heavily as others is the "impostor phenomenon." Specifically, the impostor phenomenon has been tied to mental health symptoms such as anxiety and depression, as well as high perfectionism and low self-esteem in a variety of student populations (Austin et al., 2009; Bernard et al., 2017; Bravata et al., 2019, Cokley et al., 2013; Cusack et al., 2013; McClain et al., 2016; McGregor et al., 2008; Sonnak & Towell, 2001; Thompson, 1998).

The impostor phenomenon is a term that was created by Clance and Imes (1978). It depicts high-achieving individuals who persistently doubt themselves, do not internalize their accomplishments, believe they have deceived others about their intelligence, and fear being exposed as an impostor, all despite evidence of their objective successes (Bernard et al., 2017; Bravata et al., 2019; Clance & Imes, 1978; Harvey & Katz, 1985). Students who experience impostor feelings may be unable to feel a sense of joy for their accomplishments and may turn down opportunities that would enable them to advance to their full potential, due to anxiety, self-doubt, and fear of failure (Clance & O'Toole, 1988). This was originally identified as a phenomenon among high-achieving professional women, hypothesized to be due to early family

dynamics, societal values, and later introjection of societal sex-role stereotypes (Clance & Imes, 1978; Langford & Clance, 1993).

Regarding family dynamics, it was thought that the woman's family helped instill a specific self-concept, through selective validation and positive regard (Clance et al., 1995). Thereafter, whenever events occurred which were incongruent with this self-concept, the woman distorted it or didn't recognize it. For example, if a woman only received validation for her attractiveness, she would develop a self-concept around this trait. When an event occurred that suggested that she had high intelligence (a different self-concept), she distorted it by suggesting that it was due to hard work rather than ability, since she hadn't integrated this trait into her self-concept (Clance et al., 1995).

Furthermore, researchers stated that women may internalize societal expectations of women and hold these beliefs as well, unconsciously. They might internalize the idea that females are valued for their warmth, expressiveness, and related traits, unlike males whom society associates with power, assertiveness, etc. (Clance et al., 1995). She may feel anxiety or discomfort as a result of these opposing expectations and more readily attribute her achievements to traits that are accepted as feminine, such as communication skills or empathy. Moreover, because of racial role expectations, oppression, and the normative power hierarchy which places White males at the top, Clance et al. (1995) suggested that women of color may face a particularly difficult time with feelings of impostorism. Lastly, the traditional family duties assigned to a woman's gender could create an added layer of impostorism, as they may feel that perfection is expected both at home and at work.

According to Clance and Imes (1978), there are also several ways that the cycle of impostor phenomenon could be maintained. These include: working diligently to avoid discovery

of being an impostor, not providing authentic viewpoints to avoid a negative evaluation, using perceptiveness and charm to win the approval of those superior to them, and avoiding displays of confidence, independence, and success due to negative stereotypes and societal perception of women with such characteristics. To decrease impostor feelings, Clance and Imes recommended that women participate in a group therapeutic intervention with several high-achieving women who also experienced the impostor phenomenon.

### *Impostor Phenomenon and Higher Education*

In addition to undergraduate students, studies have found that U.S. graduate students across a variety of disciplines experience impostor phenomenon (Bravata et al., 2020; Ewing et al., 1996; Parkman, 2016; Stone et al., 2018). Graduate programs include medical (Brennan-Wydra, 2021; Levant, 2020; Rosenthal et al., 2021; Thomas & Bigatti, 2020; Villwock et al., 2016) nursing (Jacobs & Sasser, 2021), dental (Metz & Mets, 2020), law, business, psychology (Tigranyan, 2020), music education (Sims et al., 2020), STEM (Chakaverty, 2020; Tao & Gloria, 2019), and management (Pervez, 2021).

### *Impostor Phenomenon and Gender*

Research since the seminal work by Clance and Imes (1978) has demonstrated that impostor feelings are experienced by both men and women. Of note, there have been inconsistencies regarding whether there are significant differences in impostor feelings by gender. Some studies have found that women report higher rates of impostor feelings than men (Cohen & McConnell, 2019; Cusack et al., 2013; Henning et al., 1998; King & Cooley, 1995; Kumar & Jagacinski, 2006; McGregor et al., 2008) while others have found no significant gender differences (Bernard et al., 2002; Bravata et al., 2019; Cozzareli & Major, 1990; Langford & Clance, 1993; Thompson, 1998).

Cokley et al. (2015) also found an association between impostor phenomenon and gender stigma consciousness. Furthermore, the impact of impostor feelings on career trajectories may depend on the interaction of gender and career. For example, some research has shown that impostor feelings might affect women's attrition in academia and pursuit of specific fields, such as STEM, since they are stereotyped as more masculine and/or their cohorts contain more males than females (Tao & Gloria, 2018). Overall, more research needs to be conducted to better understand gender differences in impostor feelings.

### *Impostor Phenomenon and Race*

Studies have found that the impostor phenomenon impacts students from a variety of ethnic/racial groups (Bernard et. al., 2017; Bravata et al., 2019). Research has demonstrated the prevalence of the impostor phenomenon amongst African American undergraduate and graduate students (Austin et al., 2009; Cokley et al., 2013; Ewing et al., 1996; Lige et al., 2017; Peteet et al., 2014) as well as Asian American and Latinx American undergraduate students (Cokley et al., 2013; Wei et al., 2020). In terms of racial group differences in the levels of impostor phenomenon, there have been mixed results and very few studies examining such differences. In a large sample of medical students, Brennan-Wydra et al. (2021) and Levant et al. (2020) found no significant differences in impostor feelings between Under-Represented Minority students and Non-Under-Represented Minority students. However, in a study of undergraduate students, it was found that Asian American undergraduate students experienced a higher level of impostor feelings than Latinx or African American students (Cokley et al., 2012).

### *Impostor Phenomenon and Mental Health*

Only a few studies have examined the relationship between impostorism and mental health within U.S. undergraduate or graduate students. This is very important to explore, given

that many U.S. students in higher education experience the impostor phenomenon and also struggle with mental health difficulties. Of note, this review only includes studies with U.S. undergraduate or graduate students, that examined constructs of mental health, depression, psychological distress, or psychological well-being.

**Impostor Phenomenon and Mental Health of White Students.** Two studies examined the relationship between impostor phenomenon and mental health within samples of predominantly White, female, and male college students. One such study, conducted by McGregor et al. (2008) examined the relationship between impostor phenomenon and depression in a sample of predominantly White students (90.9%) from a small liberal arts university in southwest U.S. Students were given the Beck Depression Inventory-II (BDI-II) to directly measure depression. Researchers found a positive correlation between impostor phenomenon scores and BDI-II scores, suggesting that those who experience impostor feelings may also experience depression symptoms.

Another study, conducted by Cusack et al. (2013) also included a predominantly White sample (64.6%), although there were individuals of other races, including African-American students (17%). Researchers found that impostor feelings and mental health were significantly correlated. Overall, when examining studies with these sample compositions, only McGregor et al. (2008)'s study directly measured depression.

**Impostor Phenomenon and Mental Health in Non-White Students.** A few studies have examined the relationship between impostor phenomenon and mental health outcomes among Non-White students. Given the unique stressors that impact their mental health, more research must be done to examine the relationship between the impostor phenomenon and mental health within minority student populations (Cokley et al., 2017).

One study examined the relationship between mental health and the impostor phenomenon within a sample of students from multiple minority backgrounds. This study, conducted by Cokley et al. (2012) examined impostor feelings amongst Asian American, African American, and Latinx American undergraduate students. The Mental Health Inventory was used, which has four subscales, three of which measure psychological distress and one that measures psychological well-being. They found that impostor feelings were significantly related to psychological well-being and distress across all racial groups and that they were a stronger predictor of these variables than minority status stress. There were no significant differences in impostor feelings between African American and Latinx students. However, it was found that Asian American students endorsed more impostor feelings than their peers from other ethnic groups, despite having the highest GPAs. The researchers hypothesized that this could be due to pressure from the model minority stereotype and familial expectations (Cokley et al., 2012).

In contrast to Cokley et al.'s (2012) study, most of the studies that examine the relationship between mental health or psychological distress and the impostor phenomenon within samples of Non-White students, only include African American students. One such study, conducted by Peteet et al. (2014) found that higher impostorism predicted higher levels of psychological distress among a sample of African American undergraduate students. Participants completed the Kessler Psychological Distress Scale, which included items about non-specific psychological distress, such as how often one felt restless and could not sit still. Some limitations of their study are that the sample was mostly women and the scale they used did not examine specific aspects of mental health such as depression, just overall psychological distress/well-being. Also, both Cokley et al. (2012) and Peteet et al. (2014) did not indicate whether the universities that students attended were predominantly White institutions (PWIs). However,

studies have suggested that African American students experience more racism and subsequently, more psychological distress, on such campuses compared to HBCUs (Bernard et al., 2020), which would potentially impact generalizability.

Another study, McClain et al. (2016), found that impostor feelings and minority status stress were negative predictors of mental health among African American undergraduate and graduate students attending PWIs across the country. The Mental Health Inventory (MHI) was used to measure mental health and included subscales of anxiety, depression, loss of behavioral control, and positive affect.

There have only been two studies that examined the direct relationship between impostor phenomenon and depression (specifically) with a sample of Non-White students (Austin et al., 2009; Bernard et al., 2017). However, like the aforementioned studies, the samples only included African American students. Austin et al. (2009) examined African American undergraduate students at a historically Black public university in the Midwest. Researchers found that impostor feelings significantly predicted depression, which was measured by The Center for Epidemiologic Studies Depression Scale. Of note, since the students attended a HBU, not a PWI, they may have had differing experiences with impostor phenomenon and mental health outcomes compared to African American students at PWIs, due to a more supportive climate and positive relationships with faculty and peers (Bernard et al., 2020; Negga et al., 2007).

The second study is also one of three studies that have examined moderators between the impostor phenomenon and mental health. Bernard et al. (2017) examined the longitudinal relationship between impostor feelings and mental health functioning, including depression symptoms, with racial discrimination and gender as moderators, in a sample of African American female college students attending a Southeastern, predominantly White institution.

Subscale items from the Symptom Checklist 90-Revised, including depression subscale items, were used to measure mental health. Researchers found that impostor feelings were associated with higher levels of depressive symptoms for African American women who experienced high levels of racial discrimination. Interestingly, initial levels of impostor feelings did not significantly predict later mental health until the moderators of racial discrimination and gender were taken into consideration. One possible explanation is that impostor feelings and mental health may be more complicated than described in past literature, that is, the relationship may rely on other variables like racial discrimination or gender. Thirdly, over time, impostor feelings may indirectly influence mental health by increasing or decreasing the influence of variables related to mental health functioning, such as emotional exhaustion (Crawford et al., 2016).

Subsequently, Bernard et al. (2020) examined John Henryism and institutional racial composition as moderators between impostor feelings and psychological well-being in a sample of African American college students, with equal numbers attending either PWIs or HBCUs. John Henryism is defined as "the individual's self-perception that they can meet [the] demands of their environment through hard work and determination" (Bernard et al., 2020). Researchers found that there was a stronger association between the impostor phenomenon and self-esteem among students at PWIs compared to HBCUs. They also found that John Henryism and racial composition jointly moderated the link between impostorism and social anxiety. Those who attended PWIs and reported high levels of John Henryism experienced the strongest association between the impostor phenomenon and social anxiety.

Wei et al. (2020) examined moderators and mediators between impostor feelings and an aspect of mental health, in the form of psychological distress. Participants in this study were all Asian American undergraduate students attending a public university in Eastern United States.

Of note, this is one of only two studies that have examined impostor feelings and mental health within Asian American undergraduate students. Researchers found that interpersonal shame partially mediated the relationship between impostor feelings and psychological distress. Furthermore, self-compassion moderated the relationship between impostor feelings and interpersonal shame as well as moderated the mediation relationship between impostor feelings, interpersonal shame, and psychological distress. One limitation is that the self-compassion scale only had two items and low Coefficient alphas.

### *Impostor Phenomenon and Mental Health of Students: Research Gaps and Limitations*

Overall, studies that examine the relationship between mental health and impostor phenomenon among U.S. college students either use samples of predominantly White students or students from one or a few minority background(s), such as African-American students only, Asian-American students only, or African American, Asian American, and Latinx students. Moreover, only one study by Cokley et al. (2013) examined differences in the prevalence of impostor feelings among various racial groups, but the groups compared were African American, Asian American, and Latinx American students. Thus, a major gap found in the literature is that no studies have examined differences in the prevalence of impostor feelings among Non-White students and White students from the same campus. Further examination in this area would be valuable in determining appropriate support.

In addition, there are several other gaps and limitations among the studies that examine the impostor phenomenon and mental health. One is campus contexts and samples. For instance, only one study included a large sample of Non-White students at a Northeastern university. Most of the other studies have focused on schools in the Southern region of the U.S. Regarding the studies that include predominantly White students, results cannot be generalized to Non-White

students, or vice versa. Furthermore, campus contexts differed amongst the samples across studies of Non-White students. Some were conducted with Non-White students that attended Historically Black Colleges, while others attended Predominantly White Institutions. Other studies did not specify the type of college students attended. It has been established that African American students may experience more psychological distress at PWIs due to the greater prevalence of racism (Bernard et al., 2020), so the generalizability of these studies may be limited to PWIs. Also, only two studies included Asian American undergraduate students in their sample (Cokley et al., 2013; Wei et al., 2020). Considering that some of these researchers found that this racial group may experience higher levels of impostor feelings than other students of color (Wei et al., 2020), it would be beneficial to conduct further studies that include Asian American students in the sample.

There is also great variability in the "mental health" constructs measured. Most examined psychological distress, overall mental health, or specific aspects of mental health such as depression. Only three studied depression directly and among those, one used a subscale to do so (Bernard et al., 2017) while the others used a full depression scale (Austin et al., 2009; McGregor et al., 2008). However, the relatively high incidence of suicide attempts/rates and levels of depression among college-age students, including minority students, suggests that more research should be conducted on the relationship between the impostor phenomenon and depression.

Furthermore, most studies that have examined the relationship between the impostor phenomenon and mental health have not examined how students can cope with the impostor feelings or how to lessen the negative effects that impostorism has on mental health (Hutchins & Rainbolt, 2017). Also, only one study examined moderators of the relationship between impostor

feelings and mental health functioning (including depression symptoms), racial discrimination, and gender (Bernard et al., 2017). Two studies examined either moderators and/or mediators between impostor feelings and psychological distress. Bernard et al. (2020) examined the moderating variables of John Henryism and institutional racial composition and Wei et al. (2020) examined self-compassion. Out of all the studies that examined the relationship between the impostor phenomenon and mental health, only Wei et al. (2020) examined a mediating variable, interpersonal shame.

It would be beneficial to expand this area of research and better understand the moderating variables that influence the relationship between the impostor phenomenon and mental health symptoms, especially depression. This knowledge might aid the creation of effective interventions to help students cope with impostor feelings, prevent negative effects on students' mental health and lower the incidence of suicidal ideation or suicide attempts.

## Perceived Social Support: Background

Researchers have found that impostor feelings can be affected by social relationships such as those with peers and mentors (Cohen & McConnell, 2019). Social support can be defined as "the existence or availability of people on whom we can rely, people who let us know that they care about, value, and love us" and there are two types: functional or perceived support and structural or received social support (Barrera, 1986). Structural or received social support refers to the existence and size of one's social network, frequency of contact, and receipt of tangible assistance, feedback, or emotional support (Hefner & Eisenberg, 2009). Perceived social support is the belief that if needed, help is available (Zhou et al., 2013).

### *Perceived Social Support and Mental Health*

Researchers have found that higher perceived social support is associated with positive psychological well-being and lower levels of depression (Alsubaie et al., 2019; Hefner & Eisenberg, 2009; Zhou et al., 2013). Furthermore, researchers have suggested that perceived social support may have a stronger influence on psychological well-being than receipt of social support (Hagerty et al., 1992; Hefner & Eisenberg, 2009; Wethington & Kessler, 1986; Whitman & Shanine, 2012). Others have suggested a framework that posits perceived social support as a moderator in coping with emotional exhaustion associated with impostor feelings (Whitman & Shanine, 2012).

***Perceived Social Support and Race***

Hefner and Eisenberg (2009) found that there were differences in the level of perceived social support experienced by students based on their racial groups. For example, they found that Asian and multi-racial students experienced lower quality perceived social support than their White peers (Hefner & Eisenberg, 2009). Of note, researchers examined students' perceived social support from friends, family, and significant others, referred to as a "special person." "Special person" was intentionally left ambiguous so that individuals could consider other potentially important sources of support such as mentors, professors, classmates, etc.

In addition, Negga et al. (2007) compared students attending a Historically Black College and University (HBCU) and Predominantly White Institution (PWI), and found that African-American students attending a PWI reported having lower levels of social support compared to their White peers, as well as compared to African-American students attending a HBCU.

Overall, there is limited research on the differences among racial groups in perceived social support. This is in contrast to demographic variables like gender, as several studies have

found that women perceive a higher level of social support than men (Hefner & Eisenberg, 2009).

### *The Impostor Phenomenon and Perceived Social Support*

Only two studies have examined the relationship between the impostor phenomenon and perceived social support within the context of higher education, one with an undergraduate population and the other with a graduate population. Cohen and McConnell (2019) examined the impostor phenomenon amongst graduate school students in a variety of fields. Students attended a predominantly White university in the Midwest. To measure perceived social support from outside the program, respondents were asked how much they agreed or disagreed with items examining the extent that they felt they had family, friends, and others they could rely on. Perceived graduate program environment was also examined via questions about mentorship quality, perceived competition for funding, and perceived isolation from faculty and students. They found that students who reported above-average perceived social support from friends and family had lower impostor scores than their peers. They also found that increased perceived isolation from students and faculty was linked to significantly higher impostor scores, when controlling for perceived social support from friends and family.

Limitations of this study included that the survey given to students was described as a study about mental health and stress experiences, so those who were either more aware of these issues or experienced these problems might have been more likely to participate (Cohen & McConnell, 2019). Furthermore, the race distribution of students was not provided, which would be helpful to determining generalizability to students based on race. Lastly, their measure of perceived social support did not specify whether the social support that students rated was from outside or inside the program.

Unlike the aforementioned researchers, Gardner et al. (2018) explored the possibility that support from peers within an organization may be less helpful for coping with impostor feelings than support outside of one. It was thought that peer support could enhance fear of exposure of deficiencies or negative peer-self comparisons (Gardner et al., 2018; Nadler & Fisher, 1986). Gardner et al. (2018) defined seeking social support in two categories, reaching in and reaching out. Reaching in referred to classmates within the program, while reaching out meant friends, significant others, and family (e.g., parents, spouse, siblings). Support from outside was measured through the Multidimensional Scale of Perceived Social Support (1988) and support from inside was measured through questions about how much support they received from each student that was in their section. Gardner et al. (2018) used undergraduate accounting majors as participants. They found that compared to seeking support from classmates inside their program, seeking social support from people outside of the program peer group (e.g., friends, family, and significant others) seemed to be more effective in decreasing their perceptions of impostorism.

One limitation of this study was that peer support was measured by a two-item questionnaire created by the researchers, so it failed to encapsulate multiple forms of support. The items asked to what extent the peer helped with homework and to what extent they provided support. The peer support measure from within the program also focused more on the construct of received social support than perceived social support. The other measure (MSPSS) focused on perceived social support, so the measures used seem incompatible. Furthermore, it is unclear whether there was overlap in the measurement of social support outside and inside the program, as students could have had "friends" that were also classmates. Finally, demographic data such as race distribution was not provided, limiting conclusions about generalizability to students of

color. It is also unclear where in the United States the program took place and whether or not the school was a PWI.

Overall, although research has found relationships between perceived social support and depression, and impostor phenomenon and perceived social support, no studies have quantitatively examined the possible moderating role of perceived social support in the relationship between impostor feelings and depression, or examined how this relationship might differ by race. This seems integral to understanding how to most effectively help students cope with these feelings and prevent severe negative impacts on mental health. Furthermore, specific limitations include that some studies are unclear about the construct they are measuring; sometimes they indicate that it is perceived social support when it's actually received social support, or vice versa. Also, studies often did not specify whether the social support that students rated came from outside or inside the program. Future research should be clear about which construct is being measured and ensure that participants understand which source of social support they should consider when completing the measures. Without this clarity, interventions based on the research may not target the most effective source or type of support.

**Sense of Belonging: Background**

The concept of belonging has been identified as an essential factor associated with psychological health ever since Maslow (1968) recognized it as one of the basic human needs in his hierarchy. However, the construct has been ambiguously defined in the literature (Tovar et al., 2009). Other terms use to describe this construct are "belongingness" and "school belonging." According to Goodenow (1993), belonging is "the extent to which students feel personally accepted, respected, included and supported by others in the school social environment." During COVID-19, it appears that sense of belonging for undergraduate and

graduate students may have decreased. For instance, Zuckerman et al. (2021) found that there was a significant decrease in classroom social support and Blankstein et al. (2020) found that students didn't feel a sense of belonging or a very strong connection to their peers.

In the literature reviewed previously, one study, conducted by Cohen and McConnell (2019), found a connection between the feeling of being an impostor and social perceptions, such as perceived mentorship quality and perceived isolation from faculty and students, or sense of belonging. This study will explore further the relationship of the impostor syndrome to sense of belonging.

### *Sense of Belonging and Mental Health*

A strong sense of belonging has been tied to many life outcomes, including psychological well-being (Kawachi & Berkman, 2001) and lower symptoms of depression among college students. Stebleton et al. (2014) found that sense of belonging negatively predicted the frequency that students reported feeling stressed, depressed, or upset. Gummadam et al. (2016) found that among college students from a variety of ethnic backgrounds, school belonging had a positive relationship with perceived self-worth and a negative relationship with depressive symptoms.

### *Sense of Belonging and Race*

Studies indicate that African-American students are more likely to experience a low sense of belonging, especially at PWIs (Graham & McClain, 2019). Johnson et al. (2007) found that African American, Asian, and Hispanic undergraduates experienced a lower sense of belonging than Caucasian students. Among STEM majors, Rainey et al. (2010) found that students of color were significantly less likely to report a sense of belonging than White students. In a study conducted by Mooney and Becker (2021), it was found that as a result of the COVID-19

pandemic, there was a significant reduction in belongingness for students who didn't identify as an ethnic/racial minority.

### *The Impostor Phenomenon and Sense of Belonging*

A small body of research suggests that sense of belonging may be associated with impostor feelings in both undergraduate and graduate students. Interviews conducted by Posselt (2018) found that among female African-American, Latinx, and Native American doctoral students, a combination of impostor feelings, the school's intellectual rigor, and experiences with racism and sexism, led students to question their belonging. They also found that faculty support, specifically validation of competence and potential, seemed to empower students to face impostorism and questions about belonging.

There has also been speculation that impostor feelings may be associated with sense of belonging among undergraduate students (Ramsey & Brown, 2018). However, only one quantitative study has actually examined this relationship. Graham and McClain (2019) found that impostor feelings were negatively correlated with belongingness, which was measured with the Campus Connectedness Scale, for a sample of African American undergraduate students at a PWI. However, the sample was comprised of 79% female students, which limits generalizability to male students.

To date, quantitative studies have not examined the role of belongingness as a moderator between the impostor phenomenon and depression in college-age students, or how this relationship might differ by race. Data of this sort would help construct appropriate interventions for coping with impostorism.

## Mindset: Background

The entity theory of intelligence (fixed mindset) and incremental theory of intelligence (growth mindset) have been examined often in past research studies. Those with more of a growth mindset are said to hold the belief that abilities such as personality characteristics can be developed over time, while those with more of a fixed mindset hold the belief that such characteristics cannot be fixed or changed (Yeager & Dweck, 2020).

According to Yeager and Dweck (2020), mindset theory grew out of the desire to determine why students that had equal abilities had dissimilar tendencies to helpless attributions or performance goals (terms based on attribution theory and achievement goal theory). Among those who are experiencing challenges, it is thought that mindset can affect achievement through the different goals and attributions held in those situations.

In summary, mindset theory posits that those with a growth mindset tend to choose goals that are learning-oriented, which typically lead to effort attribution, and lead to positive emotions and behaviors such as following through with the task at hand. In contrast, those with a fixed mindset tend to choose goals that are ability-oriented, which typically lead to ability attribution, and lead to negative emotions and behaviors such as not following through with a task. Smiley et al. (2016) conducted a path analysis examining these variables and found that results for the most part supported the framework outlined by Carol Dweck.

### *Mindset and Mental Health*

All studies that have examined the relationship between mindset and mental health have included adolescent participants. No studies have examined the relationship between mindset of intelligence and mental health within the higher education population.

For instance, in a sample of adolescents, Da Fonseca et. al (2008) examined the effects of exposure to implicit theory manipulation on IQ test performance. They found that there was a significant association between entity theory (fixed mindset) and anxiety. However, this study did not utilize the full theory of intelligence scale; instead, there was an implicit theory index that was based on an incremental theory item and entity theory item. Schleider and Weisz (2015) found that adolescents who had a fixed mindset or entity theory (either of intelligence, personality, or peer relationships) had more severe problems with their mental health. However, others have suggested that the type of entity theory matters and that specific ones like entity theory of personality may have more of an impact on mental health than others (Schleider & Weisz, 2015). Relatedly, in another study involving adolescents, it was found that theories of intelligence did not predict depressive symptoms or well-being when controlling for theories of emotion (Romero et al. 2014). Interventions on mindset have been examined in relation to mental health outcomes. Schleider and Weisz (2018) found that after a nine-month follow-up, a single session of an intervention targeting growth mindset significantly improved youth-reported depression, youth-reported anxiety, and youth-reported perceived behavioral control, as well as parent-reported youth depression.

***Mindset and Race***

There have only been a few studies that have examined the relationship between mindset and race; these studies have inconsistent results. When examining mindset of math intelligence, one study found that White students (in tenth and twelfth grades) were more likely to view intelligence as a fixed trait than Non-White students (Hwang et al., 2019). However, another study did not find significant differences among undergraduate students based on race/ethnicity (Cavanagh et al., 2018). Regarding outcomes of mindset interventions and race, one study found

that when African-American and White undergraduate students participated in a mindset intervention, African-American students who were encouraged to view intelligence as malleable obtained higher grade point average than their White peers (Aronson et al., 2002). In regards to non-college populations, a study found that Asian, Black, and Latina female adolescents reported a higher level of growth mindset regarding math than their White peers and Black and Asian male adolescents reported a higher level of growth mindset than their White peers (Seo et al., 2019).

### *Mindset and Perceived Social Support*

To date, no studies have examined the relationship between mindset and perceived social support. However, Zander et al. (2018) examined the relationship between growth mindset and integration into academic and social support networks and found that growth mindsets were significantly related to integration with academic support networks. It was thought that students who had growth mindsets were more often than those with fixed mindsets to be selected as partners that were helpful and collaborative due to their lack of social comparisons and amount of effort-related feedback.

### *Mindset and Sense of Belonging*

There is no evidence-based on the current literature that growth mindset and sense of belonging in the school environment are significantly related. Dixson (2020) found no significant correlation between sense of belonging and growth mindset in a population of male adolescents. Burnette et al. (2017) examined a sample of adolescent girls and found that when administered a mindset intervention, their growth mindset scores were not significantly correlated to school belonging scores. However, there haven't been any studies conducted examining the relationship mindset and sense of belonging in older populations, such as young adult or adult populations.

### *The Impostor Phenomenon and Mindset*

Kumar and Jagacinski (2006) found that fixed mindset was significantly related to impostor feelings for female college students, but not for male college students. However, it should be noted that this correlation was very weak and that the sample size of female participants in Kumar and Jagacinski (2006)'s study was very small ($N = 42$), which is a significant limitation. Additionally, Noskeau and Wang (2021), found that working adults that had a fixed mindset tended to experience more feelings of impostorism at work, and fear of failure explained this relationship. However, a limitation is that the mean participant age in Noskeau and Wang (2021)'s study was 40 years, which limits generalizability to folks of other age ranges. Overall, because of the contradicting results with past research, further research should be conducted to examine the relationship between impostor phenomenon and fixed mindset.

**Purpose:**

The purpose of this dissertation is to expand on the impostor phenomenon literature. Previous samples have been limited in terms of racial composition and geographic location. Thus, the present study's participant population will include both White and Non-White undergraduate and graduate students attending a highly selective and predominantly White institution (PWI) in the Northeast. The study will also examine differences in the overall level of impostor feelings according to gender and race. Furthermore, very few studies have examined potential moderators in the relationship between impostor phenomenon and depression within a multi-ethnic sample. Thus, perceived social support and sense of belonging will be examined as moderators for the relationship between impostor phenomenon and depression, and the impact of race on these moderating relationships will also be examined, to see if there are racial

differences. Lastly, very few studies have examined the relationship between mindset and impostor phenomenon, particularly in a population of undergraduate and graduate students, so this will also be explored. In addition, past measures used to examine perceived social support, sense of belonging, and depression, have had several limitations; for instance, some were researcher-created measures, measures with an insufficient number of items, or omnibus mental health measures. Therefore, for this study, only previously established and highly reliable and valid measures of perceived social support, sense of belonging, and depression will be administered.

**Hypotheses:**

The study seeks to examine the following hypotheses:

1a. When controlling for age, race, first-generation status, and degree, Female participants will have a significantly higher level of impostor phenomenon than Male participants.

1b. When controlling for age, race, first-generation status, and degree, Female participants will have a significantly higher level of impostor phenomenon than Male participants and "Other" participants combined. ("Other" participants refer to those who identified as transgender, non-binary, or non-gender-specified. More information is provided in Participants below).

1c. When controlling for age, race, first-generation status, and degree, Male participants will have a significantly lower level of impostor phenomenon than Female participants and "Other" participants combined.

2a. When controlling for age, gender, first-generation status, and degree, Asian participants will have a significantly higher level of impostor phenomenon, lower level of sense of belonging, and lower level of perceived social support compared to White participants.

2b. When controlling for age, gender, first-generation status, and degree, Other[1] participants will have a significantly higher level of impostor phenomenon, lower level of sense of belonging, and lower level of perceived social support compared to White participants.

2c. When controlling for age, gender, first-generation status, and degree, Asian participants will have a significantly higher level of impostor phenomenon, perceived social support, and sense of belonging compared to Other participants.

3. The level of impostor phenomenon will significantly correlate with the level of depression.
    a. The level of perceived social support will significantly moderate the relationship between impostor phenomenon and depression, when controlling for age, gender, first-generation status, race, and degree.
    b. The moderating effect of perceived social support will differ significantly between Asian, Other, and White participants.
    c. Sense of belonging will significantly moderate the relationship between impostor phenomenon and depression, when controlling for age, gender, first-generation status, race, and degree.
    d. The moderating effect of sense of belonging will differ significantly between Asian, Other, and White participants.
4. The level of impostor phenomenon will significantly and positively correlate with the level of fixed mindset.

[1] Since the sample sizes for each Non-White racial group besides Asian American (African-American, Hispanic or Latinx, Biracial or Multiracial, Middle Eastern) were small, a new variable was computed called "Other" that included these groups.

Figure 1

*Model of Variables with Sense of Belonging as Moderator*

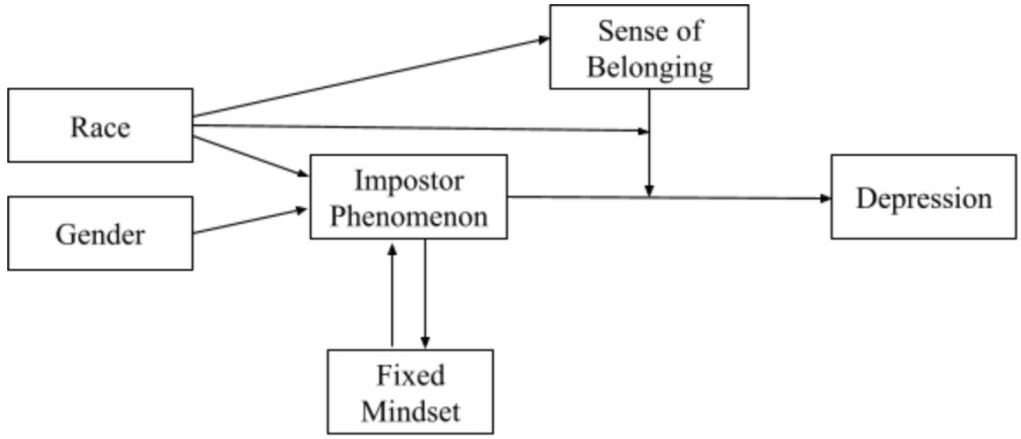
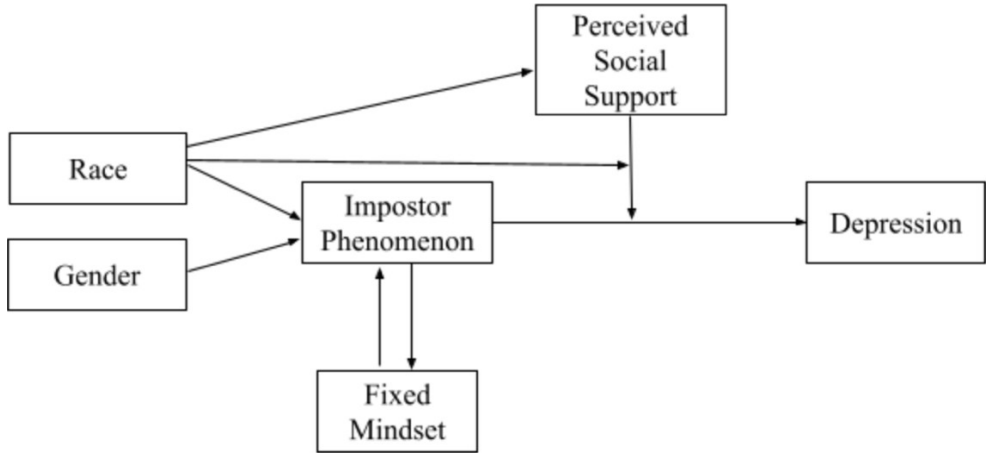



Figure 2

*Model of Variables with Perceived Social Support as Moderator*



# Chapter 2: Methodology

## Participants

Undergraduate and graduate students enrolled in a large private, Predominantly White Institution (PWI) located in the Northeastern United States were recruited for this study. The study received approval from the university's Institutional Review Board, after which participants were recruited through various methods, including physical and online flyers, online bulletins, emails, and the university-based research participant pool. Most undergraduate student participants received course credit for their participation in the study. Some graduate student participants received extra credit for a course upon completion of the study. If participants chose to leave the study, they were unable to receive course credit or extra credit for their course. According to a power analysis conducted with G* Power (Faul et al., 2009), it was determined that 105 participants would be needed for this study.

The overall sample originally comprised 438 participants. After the removal of incomplete responses and those that did not meet the inclusion criteria (currently enrolled as undergraduate or graduate students), the final sample comprised 414 participants ($N = 414$). The majority of the sample were undergraduate students ($n = 246$, 59.7%) and 40.3% were graduate students ($n = 167$). The sample included 43.6% White/Caucasian ($n = 179$), 26.3% Asian American ($n = 108$), 12.8% Biracial or Multiracial ($n = 53$), 8.5% Hispanic or Latinx ($n = 35$), 5.4% African-American ($n = 22$), and 3.4% Middle Eastern ($n = 14$) participants. Since the sample sizes for each Non-White racial group besides Asian American (African-American, Hispanic or Latinx, Biracial or Multiracial, Middle Eastern) were small, a new variable was computed that included the rest of the groups. Furthermore, 87% of the sample was female ($n = 360$), 10.4% was male ($n = 43$), and 2.6% was non-binary, transgender or non-gender-specified

participants ($n$ = 11). Due to the small sample sizes, non-binary, transgender, and non-gender-specified participants were grouped into an "Other" variable. The mean participant age was 22.86 and ranged from 18-67. Lastly, 77.3% of the sample consisted of non-first-generation college students ($n$ = 320) and 22.7% consisted of first-generation college students ($n$ = 94). Table 1 shows the frequencies and percentages for the aforementioned demographic variables.

**Table 1.**

*Sample Sizes for Categorical Demographic Variables of Final Sample*

| Variable | *n* | *%* |
|---|---|---|
| Gender | 414 | 100.0 |
| Female | 360 | 87.0 |
| Male | 43 | 10.4 |
| Other | 11 | 2.6 |
| Race | 411 | 100.0 |
| African-American | 22 | 5.4 |
| White or Caucasian | 179 | 43.6 |
| Asian-American | 108 | 26.3 |
| Hispanic or Latinx | 35 | 8.5 |
| Middle Eastern | 14 | 3.4 |
| Biracial or Multiracial | 53 | 12.8 |
| First Generation Status | 414 | 100.0 |
| First Generation | 94 | 22.7 |
| Not First Generation | 320 | 77.3 |
| Degree | 414 | 100.0 |
| Undergraduate | 247 | 59.7 |
| Graduate | 167 | 40.3 |

**Design**

This study was non-experimental in design. The dependent variables were self-reported symptoms of depression and fixed mindset. The independent variable was the impostor

phenomenon. Moderator variables were perceived social support and sense of belonging.

**Procedure**

All of the study measures were presented to participants through an online Qualtrics survey. Study recruitment was done through various methods. Initially, physical flyers were posted on approved surfaces of the university's undergraduate and graduate campuses. This flyer included a QR code that provided direct access to the Qualtrics survey link. The principal investigator of the study and volunteer graduate research assistants from the university engaged in this task. Online flyers were also posted on various campus bulletin boards and emailed to various university faculty from undergraduate and graduate campuses. Within the recruitment emails was information about eligibility requirements, a portable document format version of the flyer, and an electronic link that directed viewers to the Qualtrics survey. Lastly, the study was posted on a university-based research participant pool. This is where most undergraduate participants signed up to take the study.

To take the survey, all participants clicked on an electronic link and completed an online Qualtrics survey. Overall, this survey involved an informed consent form, demographics questionnaire, and several measures. The first few pages included a description of the study, information about their rights as participants, and an informed consent form for them to electronically initial. Once initialed, the participant was able to view and complete the following pages. These pages included measures on demographics, impostor phenomenon, perceived social support, sense of belonging, mindset, and depression. At the end of the study, the participants viewed a final page with contact information for the university counseling center.

**Materials**

The materials consisted of a demographic questionnaire and measures of the impostor

phenomenon, perceived social support, sense of belonging, mindset, and depression, which were completed by all participants. To reduce order effects, the questionnaires were presented in random order to each participant.

***Demographics***

The demographics questionnaire requested information regarding gender, race, age, socio-economic status, cumulative grade-point average, first-generation college status, degree status, year in school, and declared or intended major.

***The Clance Impostor Phenomenon Scale (CIPS; Clance, 1985) (see Appendix A)***

Participants completed the 20-item *The Clance Impostor Phenomenon Scal*e (CIPS; Clance, 1985), which measured the degree that the person felt impostor feelings, on a scale from 1 (not true at all) to 5 (very true). This is the most widely used measure of impostor phenomenon and has a reported Cronbach's alpha from .92 to .96 (Chrisman et al., 1995; Holmes et al., 1993). In terms of construct and discriminant validity, Rohrmann et al. (2016) conducted confirmatory factor analyses and found that impostorism is a separate construct and can be distinguished from constructs such as depression, neuroticism, and perfectionism. In terms of convergent validity, the CIPS has been positively correlated with other measures of impostorism (Chrisman et al., 1995). Sample items include "Sometimes I'm afraid others will discover how much knowledge or ability I really lack." The higher the cumulative score, the greater the level of Impostor Phenomenon. In the current study, the Cronbach's alpha was 0.92.

***Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) (see Appendix B)***

Participants completed the 12-item scale, which measured the degree that they perceived social support from family, friends and significant others, on a scale from 1 (very strongly

disagree) to 7 (very strongly agree). The scale has a reported Cronbach's alpha of .88. Sample item includes "I can count on my friends when things go wrong." For the purposes of this study, the scores on this measure were not broken down by type of social support and instead were summed into a total score for each participant. Thus, the higher the score, the greater the level of perceived social support. In the current study, the Cronbach's alpha was 0.90.

***The Psychological Sense of School Membership (PSSM; Goodenow, 1993) (see Appendix C)***

Participants completed an 18-item scale, which measured their sense of the belonging to their school, on a scale from 1 (not at all true) to 5 (completely true). This is the most frequently used instrument to measure the construct of sense of belonging within an educational context. Although the instrument has been used predominantly in K-12 settings, recent studies have adapted it for usage with college-level participants. Within samples of middle school students, internal consistency reliability was reported to be from .77 to .88 depending on the sample (Goodenow, 1993). Freeman et al. (2007) adapted the scale for college students and separated the scales into two measures: university belonging and class belonging. The measure of university belonging had a reported alpha of .79 and class belonging had an alpha of .90. Gummadam et al. (2016) adapted the instrument for U.S. college students from a variety of ethnic backgrounds and reported an internal consistency of .89 and .87-.89 across the ethnic groups. Furthermore, Alkan (2016) translated and adapted the instrument for a large sample of Turkish college students and reported that the instrument had an internal consistency of .84. Regarding scoring, some items are reverse coded. Thus, as the total score increases, the sense of belonging increases. In the current study, the Cronbach's α was 0.89.

***Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) (see Appendix D)***

Participants completed a 20-item scale, which measured the degree that the person experiences depressive symptoms within the past week, on a scale from rarely or none of the time (less than 1 day) to most or all of the time (5-7 days). This scale has a reported internal consistency that ranges from .85 to .90 as well as substantial evidence of construct validity (Radloff, 1977). Higher scores indicate higher levels of depressive symptoms. In the current scale, the Cronbach's α was 0.91.

***Implicit Theories of Intelligence (Dweck 1999) (see Appendix E)***

Participants completed an 8-item scale, which measured the degree that the person experiences a growth mindset, on a 6-point Likert scale, from strongly agree to strongly disagree. Four items were indicative of growth mindset, and four were indicative of fixed mindset. Some items are reverse scored. This scale has been widely used in past studies and has good internal reliability and test-retest reliability. For instance, Zhou and Bai (2020) found that the fixed mindset items had a Cronbach's α of 0.89 and the growth mindset items had a Cronbach's α of 0.92. In the current study, the fixed mindset items had a Cronbach's α of .93 while the growth mindset items had a Cronbach's α of 0.92.

# Chapter 3: Results

Statistical analyses were conducted using Statistical Product and Service Solutions (SPSS) Version 28 (IBM Corp, 2021). The items within the Implicit Theories of Intelligence, Center for Epidemiologic Studies Depression Scale, and the Psychological Sense of School Membership measure that required reverse coding were reverse-coded. Sums of scores for these quantitative measures along with the others were then computed into separate variables, resulting in variables for: Impostor Phenomenon, Depression, Sense of Belonging, Mindset, and Perceived Social Support. In addition, there were five demographic variables: Age, Gender, Race, Degree, and First-Generation Status. These demographic variables were dummy coded. One dummy variable each was created for the First-Generation Status and Degree variables. For First-Generation Status, 0 = Non-First Generation and 1 = First-Generation, and for Degree, 0 = Undergraduate and 1 = Graduate. Two dummy variables were created for the race variables, due to the three levels in each, with the code of "1" indicating the individual identified as that race and the code of "0" indicating that they did not identify as that race. Two dummy variables were also created for the gender variables, due to the three levels in each, with the code of "1" indicating the individual identified as that gender and the code of "0" indicating that they did not identify as that gender.

After the final sample was determined, descriptive statistics were first analyzed, such as sample sizes, means, and standard deviations. Pearson correlations were conducted to examine associations between the study's variables, including the association between impostor phenomenon and depression symptoms, as well as impostor phenomenon and fixed mindset.

Several univariate analyses of covariance (ANCOVA) tests were run to examine the differences between Female and Male, Female and Non-Female, and Male and Non-Male

participants in regards to impostor phenomenon, when controlling for age, race, first generation status, and degree. These demographic variables were controlled because they were significantly correlated with one or more major variables of interest.

Several univariate analyses of covariance (ANCOVA) tests were also run to examine the differences between White and Asian, Asian and Other, and White and Other participants in regards to impostor phenomenon, sense of belonging, and perceived social support, when controlling for age, gender, first generation status, and degree. These demographic variables were controlled because they were significantly correlated with one or more major variables of interest.

Multiple regression analyses were conducted to test the moderation interactions for the two moderators, perceived social support and sense of belonging, while controlling for age, gender, first generation status, and degree. These demographic variables were controlled because they were significantly correlated with one or more major variables of interest. The continuous independent variables were centered to avoid high multicollinearity with the interaction terms. Additional analyses were conducted to examine racial differences among the potential moderating effects of perceived social support and sense of belonging.

Lastly, supplementary analyses were conducted to examine differences in impostor phenomenon, mindset, perceived social support, sense of belonging, and depression based on degree status (undergraduate or graduate), after controlling for age, gender, race, and first-generation status. These demographic variables were controlled because they were significantly correlated with one or more major variables of interest. A multivariate analysis of covariance (MANCOVA) test was run to compare the level of these variables in undergraduate and graduate participants.

**Table 2**

*Means, Standard Deviations, and Correlations for Study Variables*

| Variable | *1* | *2* | *3* | *4* | *5* | *6* | *7* |
|---|---|---|---|---|---|---|---|
| 1. MS | - | | | | | | |
| 2. DEP | .02 | - | | | | | |
| 3. IP | .02 | .54** | - | | | | |
| 4. PSS | .02 | -.39** | -.21** | - | | | |
| 5. SB | -.02 | -.57** | -.38** | .37** | - | | |
| 6. Age | -.01 | -.11* | .04 | .04 | .06 | - | |
| 7. FGS | -.05 | .07 | .10* | -.15** | -.14** | .10* | - |
| 8. Degree | -.05 | -.07 | .10* | -.02 | .00 | .64** | .06 |
| *n* | 414 | 414 | 414 | 414 | 414 | 411 | 414 |
| *M* | 2.97 | 43.15 | 74.2 | 65.26 | 60.21 | 22.86 | 0.57 |
| *SD* | 1.17 | 11.24 | 14.23 | 13.84 | 11.0 | 6.88 | 0.50 |

*Note*. All continuous variables were mean centered prior to Pearson correlation (pairwise) analysis. MS = Fixed Mindset, DEP = Depression, IP = Impostor Phenomenon, PSS = Perceived Social Support, SB = Sense of Belonging, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation, and for Degree, 0 = Undergraduate and 1 = Graduate. *n* indicates sample size, *M* indicates mean, *SD* indicates standard deviation.

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

**Hypothesis 1a**

When controlling for age, race, first-generation status, and degree, Female participants will have a significantly higher level of impostor phenomenon than Male participants.

**Results**

An ANCOVA test was conducted for the dependent variable: impostor phenomenon, with the independent variable of gender (Female or Male), while controlling for age, race, first-generation status, and degree.

According to the univariate test, there were significant differences between Female and Male participants on the level of impostor phenomenon $F$ (1, 1948.38) = 9.93, $p$ = .002. Descriptive statistics revealed that Female participants had a significantly higher level of impostorism ($M$ = 74.83, $SD$ = 14.08) compared to Male participants ($M$ = 67.14, $SD$ = 14.35).

**Hypothesis 1b**

When controlling for age, race, first-generation status, and degree, Female participants will have a significantly higher level of impostor phenomenon than Male participants and "Other" participants combined.

**Results**

An ANCOVA test was conducted for the dependent variable: impostor phenomenon, with the independent variable of gender (Female or Non-Female), while controlling for age, race, first-generation status, and degree.

According to the univariate test, there were no significant differences between Female and Non-Female participants on the level of impostor phenomenon $F$ (1, 746.10) = 3.78, $p$ = .053.

**Hypotheses 1c**

When controlling for age, race, first-generation status, and degree, Male participants will have a significantly lower level of impostor phenomenon than Female participants and "Other" participants combined.

**Results**

An ANCOVA test was conducted for the dependent variable: impostor phenomenon, with the independent variable of gender (Male or Non-Male), while controlling for age, race, first-generation status, and degree.

According to the univariate test, there were significant differences between Male and Non-Male participants on the level of impostor phenomenon $F$ (1, 2081.80) = 10.72, $p$ = .001. Descriptive statistics revealed that Male participants had a significantly lower level of impostorism ($M$ = 67.14, $SD$ = 14.35) compared to Non-Male participants ($M$ = 75.04, $SD$ = 14.00).

**Hypothesis 2a**

When controlling for age, gender, first-generation status, and degree, Asian participants will have a significantly higher level of impostor phenomenon, lower level of sense of belonging, and lower level of perceived social support compared to White participants.

**Results**

Several univariate ANCOVA tests were conducted for the dependent variables: impostor phenomenon, perceived social support, and sense of belonging, with the independent variable of race (Asian or White), while controlling for age, gender, first generation status, and degree.

According to the first univariate test, there were no significant differences between Asian and White participants on the level of impostor phenomenon $F$ (1, 279) = .10, $p$ = .750. The

second univariate test indicated significant differences on the level of perceived social support $F$ (1, 279) = 17.84, $p < .001$. Descriptive statistics revealed that Asian participants had a significantly lower level of perceived social support ($M$ = 61.20, $SD$ = 13.77) compared to White participants ($M$ = 68.72, $SD$ = 13.02). The third univariate test indicated no significant differences in sense of belonging between Asian and White participants $F$ (1, 279) = .024, $p$ = .876.

**Hypothesis 2b**

When controlling for age, gender, first generation status, and degree, Other participants will have a significantly higher level of impostor phenomenon, lower level of sense of belonging, and lower level of perceived social support compared to White participants.

**Results**

Several univariate ANCOVA tests were conducted for the dependent variables: impostor phenomenon, perceived social support, and sense of belonging, with the independent variable of race (Other or White), while controlling for age, gender, first generation status, and degree.

According to the first univariate test, there were no significant differences between Other and White participants on the level of impostor phenomenon $F$ (1, 297) = 1.33, $p$ = .250. The second univariate test indicated significant differences on the level of perceived social support $F$ (1, 297) = 4.42, $p$ = .036. Descriptive statistics revealed that Other participants had a significantly lower level of perceived social support ($M$ = 63.71, $SD$ = 13.96) compared to White participants ($M$ = 68.72, $SD$ = 13.02). The third univariate test indicated no significant differences in sense of belonging between Other and White participants $F$ (1, 297) = 1.50, $p$ = .222.

**Hypothesis 2c**

When controlling for age, gender, first generation status, and degree, Asian participants will have a significantly higher level of impostor phenomenon, perceived social support and sense of belonging compared to Other participants.

**Results**

Several univariate ANCOVA tests were conducted for the dependent variables: impostor phenomenon, perceived social support, and sense of belonging, with the independent variable of race (Other or White), while controlling for age, gender, first generation status, and degree.

According to the first univariate test, there were no significant differences between Asian and Other participants on the level of impostor phenomenon $F$ (1, 228) = 1.45, $p$ = .230. The second univariate test also indicated no significant differences on the level of perceived social support $F$ (1, 228) = 3.06, $p$ = .081. Lastly, the third univariate test indicated no significant differences in sense of belonging between Asian and Other participants $F$ (1, 228) = 1.18, $p$ = .278.

**Hypothesis 3**

The level of impostor phenomenon will significantly correlate with the level of depression.

**Results**

A Pearson correlation coefficient was computed to assess the linear relationship between level of impostor phenomenon and level of depression. There was a significant correlation between the level of impostor phenomenon and the level of depression, $r$ [414] = .54, $p < .001$. This significant positive relationship suggests that as the level of impostor phenomenon increases, the level of depression symptoms increases.

**Hypothesis 3a**

The level of perceived social support will significantly moderate the relationship between impostor phenomenon and depression, when controlling for age, gender, first generation status, race, and degree.

**Results**

To test the hypothesis, a multiple regression analysis was conducted. Five demographic variables were included: age, gender, degree, race, and first-generation status. To avoid potentially problematic high multicollinearity with the interaction term, the independent (impostor phenomenon) and moderator (perceived social support) variables were centered.

Results indicated none of the covariates were significant: race (White vs. Other) ($\beta$ = .02, $p$ = .681), race (Asian vs. Other) ($\beta$ = -.08, $p$ = .096), degree ($\beta$ = -.08, $p$ = .103), gender (Male vs. Other) ($\beta$ = -.01, $p$ = .937), gender (Female vs. Other) ($\beta$ = .01, $p$ = .860), first-generation status ($\beta$ = -.01, $p$ = .863), and age ($\beta$ = -.06, $p$ = .264). The main effect for perceived social support ($\beta$ = .30, $p$ = .158) was not statistically significant. The main effect for impostor phenomenon ($\beta$ = 1.04, $p$ < .001) was statistically significant. The interaction term between impostor phenomenon and perceived social support was significant ($\beta$ = -.75, $p$ = .004), indicating a significant moderation between the level of impostor phenomenon and the level of perceived social support on the level of depression. Please see table 3.

**Table 3.**

*Regression Coefficients for Predicting Depression based on Perceived Social Support and Impostor Phenomenon: Main Effects and Two-Way Interaction*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | .76 | 12.54 | | .06 | .952 |
| Race (White) | .44 | 1.08 | .02 | .41 | .681 |
| Race (Asian) | -1.95 | 1.17 | -.08 | -1.67 | .096 |

| | | | | | |
|---|---|---|---|---|---|
| Degree | -1.91 | 1.17 | -.08 | -1.64 | .103 |
| Gender (Male) | -.24 | 3.06 | -.01 | -.08 | .937 |
| Gender (Female) | .48 | 2.73 | .01 | .18 | .860 |
| FGS | -.19 | 1.11 | -.01 | -.17 | .863 |
| Age | -.09 | .08 | -.06 | -1.12 | .264 |
| PSS | .24 | .17 | .30 | 1.42 | .158 |
| IP | .82 | .16 | 1.04 | 5.29 | <.001 |
| IP x PSS | -.01 | .00 | -.75 | -2.91 | .004 |

*Note*. IP = Impostor Phenomenon, PSS = Perceived Social Support, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

Figure 1 shows the interaction plot between impostor phenomenon and perceived social support on depression. Examination of the plot showed that as impostor phenomenon increased and perceived social support decreased, level of depression increased. At the low level of impostor phenomenon, level of depression was highest for low perceived social support and level of depression was lowest for high perceived social support. Those with high levels of impostor phenomenon and low levels of perceived social support had the highest levels of depression.

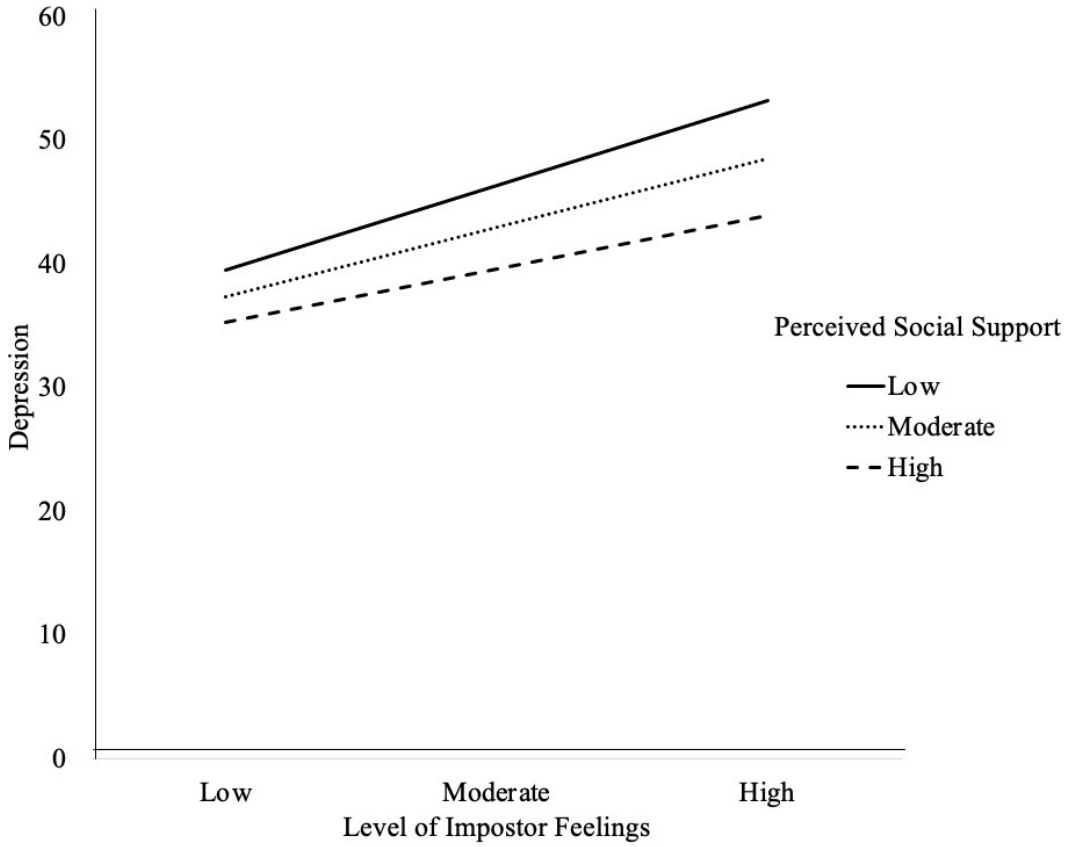



**Figure 3.** Two-way interaction between Impostor Phenomenon and Perceived Social Support on Depression.

*Note:* The levels of impostor phenomenon and perceived social support were divided into Low, Moderate, and High groups based on values 1 *SD* below the mean, the mean, and 1 *SD* above the mean.

A multiple regression analysis was also run with the five demographic variables and main effects for perceived social support and impostor phenomenon. None of the covariates were significant: race (White vs. Other) ($\beta$ = .03, $p$ = .572), race (Asian vs. Other) ($\beta$ = -.07, $p$ = .131), degree ($\beta$ = -.07, $p$ = .154), gender (Male vs. Other) ($\beta$ = -.02, $p$ = .843), gender (Female vs. Other) ($\beta$ = .00, $p$ = .978), first-generation status ($\beta$ = .01, $p$ = .911), and age ($\beta$ = -.08, $p$ = .148). The main effects for perceived social support ($\beta$ = -.31, $p$ < .001) and impostor phenomenon ($\beta$ = .48, $p$ < .001) were statistically significant. Please see table 4.

**Table 4.**

*Regression Coefficients for Predicting Depression based on Perceived Social Support and Impostor Phenomenon: Main Effects*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | 34.73 | 4.65 | | 7.47 | <.001 |
| Race (White) | .62 | 1.09 | .03 | .57 | .572 |
| Race (Asian) | -1.78 | 1.18 | -.07 | -1.51 | .131 |
| Degree | -1.68 | 1.17 | -.07 | -1.43 | .154 |
| Gender (Male) | -.61 | 3.08 | -.02 | -.20 | .843 |
| Gender (Female) | .08 | 2.76 | .00 | .03 | .978 |
| FGS | .12 | 1.11 | .01 | .11 | .911 |
| Age | -.12 | .08 | -.08 | -1.45 | .148 |
| PSS | -.25 | .03 | -.31 | -7.32 | <.001 |
| IP | .38 | .03 | .48 | 11.80 | <.001 |

*Note*. IP = Impostor Phenomenon, PSS = Perceived Social Support, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

**Hypothesis 3b**

The moderating effect of perceived social support will differ significantly between Asian, Other, and White participants.

**Results**

To test the hypothesis of whether the moderating effect of perceived social support on depression differs significantly by race, several multiple regression analyses were conducted based on different referents of race.

In the first analysis, the referent category of race was "Other." Five demographic variables were included: age, gender, degree, race, and first-generation status. The dependent variable was depression. The centered terms for impostor phenomenon and perceived social

support were also part of the model. Several interaction terms were added to the equation: impostor phenomenon x perceived social support, impostor phenomenon x White, impostor phenomenon x Asian, impostor perceived social support x White, perceived social support x Asian, impostor phenomenon x perceived social support x White, and impostor phenomenon x perceived social support x Asian.

None of the covariates were significant: race (White vs. Other) ($\beta$ = .32 $p$ = .798), race (Asian vs. Other) ($\beta$ = .15, $p$ = .901), degree ($\beta$ = -.08, $p$ = .106), (gender (Male vs. Other) ($\beta$ = -.00, $p$ = .964), gender (Female vs. Other) ($\beta$ = .01, $p$ = .867), first-generation status ($\beta$ = -.01, $p$ = .837), and age ($\beta$ = -.06, $p$ = .272). The main effect for impostor phenomenon ($\beta$ = 1.15, $p <$ .001) was statistically significant. The interaction term between impostor phenomenon and perceived social support was significant ($\beta$ = -.93, $p$ = .023). The interaction terms between impostor phenomenon and White ($\beta$ = -.47, $p$ = .703) and impostor phenomenon and Asian ($\beta$ = -.30, $p$ = .798) were not significant. The interaction term between perceived social support and White ($\beta$ = -.45, $p$ = .720) and perceived social support and Asian ($\beta$ = -.29, $p$ = .805) were also not significant. The interaction term between impostor phenomenon, perceived social support, and White was not significant ($\beta$ = .62, $p$ = .612) and the interaction term between impostor phenomenon, perceived social support, and Asian ($\beta$ = .35, $p$ = .751) was not significant. Since the referent category was the race of "Other," these results indicate that the moderating effect of perceived social support does not differ significantly between Asian and Other participants or White and Other participants. Please see table 5.

**Table 5.**

*Regression Coefficients for Predicting Depression based on Perceived Social Support, Impostor Phenomenon, and Race: Main Effects and Three-Way Interactions*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | -3.54 | 18.74 | | -.19 | .850 |
| Race (White) | 7.20 | 28.10 | .32 | .26 | .798 |
| Race (Asian) | 3.88 | 31.21 | .15 | .12 | .901 |
| Degree | -1.91 | 1.18 | -.08 | -1.62 | .106 |
| Gender (Male) | -.14 | 3.09 | -.00 | -.05 | .964 |
| Gender (Female) | .46 | 2.76 | .01 | .17 | .867 |
| FGS | -.23 | 1.13 | -.01 | -.21 | .837 |
| Age | -.09 | .09 | -.06 | -1.10 | .272 |
| PSS | .33 | .27 | .41 | 1.23 | .218 |
| IP | .91 | .24 | 1.15 | 3.76 | <.001 |
| IP x PSS | -.01 | .00 | -.93 | -2.28 | .023 |
| IP x White | -.14 | .37 | -.47 | -.38 | .703 |
| IP x Asian | -.10 | .40 | -.30 | -.26 | .798 |
| PSS x White | -.14 | .40 | -.45 | -.36 | .720 |
| PSS x Asian | -.12 | .47 | -.29 | -.25 | .805 |
| IP x PSS x White | .00 | .01 | .62 | .51 | .612 |
| IP x PSS x Asian | .00 | .01 | .35 | .32 | .751 |

*Note*. IP = Impostor Phenomenon, PSS = Perceived Social Support, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

In the second analysis, the referent category of race was "Asian." Five demographic variables were included: age, gender, degree, race, and first-generation status. The dependent variable was depression. The centered terms for impostor phenomenon and perceived social support were also part of the model. Several interaction terms were added to the equation: impostor phenomenon x perceived social support, White x perceived social support, Other x perceived social support, White x level of impostor phenomenon, Other x impostor phenomenon, impostor phenomenon x perceived social support x White, and impostor phenomenon x perceived social support x Other.

None of the covariates were significant: race (Other vs. Asian) ($\beta$ = -.16, $p$ = .901), race (White vs. Asian) ($\beta$ = .15 $p$ = .920), degree ($\beta$ = -.08 $p$ = .106), gender (Male vs. Other) ($\beta$ = -.00

$p$ = .964), gender (Female vs. Other) ($\beta$ = .01 $p$ = .867), first-generation status ($\beta$ = -.01, $p$ = .837), and age ($\beta$ = -.06, $p$ = .272). The main effect for impostor phenomenon ($\beta$ = 1.02, $p$ = .013) was statistically significant. The interaction terms between impostor phenomenon and Other ($\beta$ = .33, $p$ = .798) and between impostor phenomenon and White ($\beta$ = -.12, $p$ = .931) were not significant. The interaction term between perceived social support and Other ($\beta$ = .31, $p$ = .805) and perceived social support and White ($\beta$ = -.09, $p$ = .954) were also not significant. The interaction term between impostor phenomenon, perceived social support, and Other ($\beta$ = -.41, $p$ = .751) and the interaction term between impostor phenomenon, perceived social support, and White was not significant ($\beta$ = .17, $p$ = .906). Since the referent category was the race of "Asian," these results indicate that the moderating effect of perceived social support does not differ significantly between White and Asian participants or Other and Asian participants. Please see table 6.

**Table 6.**

*Regression Coefficients for Predicting Depression based on Perceived Social Support, Impostor Phenomenon, and Race: Main Effects and Three-Way Interactions*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | $t$ | Sig |
|---|---|---|---|---|---|
| Constant | .34 | 25.66 | | .01 | .990 |
| Race (Other) | -3.88 | 31.21 | -.16 | -.12 | .901 |
| Race (White) | 3.32 | 33.23 | .15 | .10 | .920 |
| Degree | -1.91 | 1.18 | -.08 | -1.62 | .106 |
| Gender (Male) | -.14 | 3.09 | -.00 | -.05 | .964 |
| Gender (Female) | .46 | 2.76 | .01 | .17 | .867 |
| FGS | -.23 | 1.13 | -.01 | .21 | .837 |
| Age | -.09 | .09 | -.06 | -1.10 | .272 |
| PSS | .22 | .38 | .27 | .58 | .565 |
| IP | .80 | .32 | 1.02 | 2.49 | .013 |
| IP x PSS | -.01 | .01 | -.71 | -1.28 | .203 |
| IP x Other | .10 | .40 | .33 | .26 | .798 |
| IP x White | -.04 | .43 | -.12 | -.09 | .931 |

| | | | | | |
|---|---|---|---|---|---|
| PSS x Other | .12 | .47 | .31 | .25 | .805 |
| PSS x White | -.03 | .48 | -.09 | -.06 | .954 |
| IP x PSS x Other | -.00 | .01 | -.41 | -.32 | .751 |
| IP x PSS x White | .00 | .01 | .17 | .12 | .906 |

*Note*. IP = Impostor Phenomenon, PSS = Perceived Social Support, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

In the third analysis, the referent category of race was "White." Five demographic variables were included: age, gender, degree, race, and first-generation status. The dependent variable was depression. The centered terms for impostor phenomenon and perceived social support were also part of the model. Several interaction terms were added to the equation: impostor phenomenon x perceived social support, impostor phenomenon x Other, impostor phenomenon x Asian, perceived social support x Other, perceived social support x Asian, impostor phenomenon x perceived social support x Other, and impostor phenomenon x perceived social support x Asian.

None of the covariates were significant: race (Other vs. White) ($\beta$ = -.30 $p$ = .798), race (Asian vs. White) ($\beta$ =- .13, $p$ = .920), degree ($\beta$ = -.08, $p$ = .106), gender (Male vs. Other) ($\beta$ = -.00, $p$ = .964), gender (Female vs. Other) ($\beta$ = .01, $p$ = .867), first-generation status ($\beta$ = -.01, $p$ = .837), and age ($\beta$ = -.06, $p$ = .272). The main effect for impostor phenomenon ($\beta$ = .97, $p$ = .006) was statistically significant. The interaction terms between impostor phenomenon and Other ($\beta$ = .45, $p$ = .703) and impostor phenomenon and Asian ($\beta$ = .11, $p$ = .931) were not significant. The interaction term between perceived social support and Other ($\beta$ = .39, $p$ = .720) and perceived social support and Asian ($\beta$ = .07, $p$ = .954) were also not significant. The interaction term between impostor phenomenon, perceived social support, and Other was not significant ($\beta$ = -.56, $p$ = .612) and the interaction term between impostor phenomenon, perceived social support,

and Asian ($\beta$ = -.14, $p$ = .906) was not significant. Since the referent category was the race of "White," these results indicate that the moderating effect of perceived social support does not differ significantly between Asian and White participants or Other and White participants. Please see table 7.

**Table 7.**

*Regression Coefficients for Predicting Depression based on Perceived Social Support, Impostor Phenomenon, and Race: Main Effects and Three-Way Interactions*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | 3.66 | 21.77 | | .17 | .867 |
| Race (Other) | -7.20 | 28.10 | -.30 | -.26 | .798 |
| Race (Asian) | -3.32 | 33.23 | -.13 | -.10 | .920 |
| Degree | -1.91 | 1.18 | -.08 | -1.62 | .106 |
| Gender (Male) | -.14 | 3.09 | -.00 | -.05 | .964 |
| Gender (Female) | .46 | 2.76 | .01 | .17 | .867 |
| FGS | -.23 | 1.13 | -.01 | -.21 | .837 |
| Age | -.09 | .09 | -.06 | -1.10 | .272 |
| PSS | .19 | .30 | .24 | .64 | .520 |
| IP | .77 | .28 | .97 | 2.74 | .006 |
| IP x PSS | -.01 | .00 | -.63 | -1.42 | .157 |
| IP x Other | .14 | .37 | .45 | .38 | .703 |
| IP x Asian | .04 | .43 | .11 | .09 | .931 |
| PSS x Other | .14 | .40 | .39 | .36 | .720 |
| PSS x Asian | .03 | .48 | .07 | .06 | .954 |
| IP x PSS x Other | -.00 | .01 | -.56 | -.51 | .612 |
| IP x PSS x Asian | -.00 | .01 | -.14 | -.12 | .906 |

*Note*. IP = Impostor Phenomenon, PSS = Perceived Social Support, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

**Hypothesis 3c**

Sense of belonging will significantly moderate the relationship between impostor phenomenon and depression, when controlling for age, gender, first generation status, race, and degree.

**Results**

To test the hypothesis of whether sense of belonging moderates the relationship between the impostor phenomenon and depression, a multiple regression analysis was conducted. Five demographic variables were included: age, gender, degree, race, and first-generation status. To avoid potentially problematic high multicollinearity with the interaction term, the independent (impostor phenomenon) and moderator (sense of belonging) variables were centered.

None of the covariates were significant: race (White vs. Other) ($\beta$ = .01, $p$ = .763), race (Asian vs. Other) ($\beta$ = -.02, $p$ = .612), degree ($\beta$ = -.07, $p$ = .171), gender (Male vs. Other) ($\beta$ = -.11, $p$ = .156), gender (Female vs. Other) ($\beta$ = -.07, $p$ = .378), first-generation status ($\beta$ = -.01, $p$ = .846), and age ($\beta$ = -.06, $p$ = .256). The main effect for sense of belonging was not significant ($\beta$ = -.06, $p$ = .757). The main effect for impostor phenomenon ($\beta$ = .78, $p$ < .001) was significant. The impostor phenomenon and sense of belonging interaction was significant ($\beta$ = -.44, $p$ = .036), indicating a significant moderation between the impostor phenomenon and sense of belonging on the level of depression. Please see table 8.

**Table 8.**

*Regression Coefficients for Predicting Depression based on Sense of Belonging and Impostor Phenomenon: Main Effects and Two-Way Interaction*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | $t$ | Sig |
|---|---|---|---|---|---|
| Constant | 28.24 | 12.53 | | 2.25 | .025 |
| Race (White) | .31 | 1.02 | .01 | .30 | .763 |
| Race (Asian) | -.56 | 1.10 | -.02 | -.51 | .612 |

| | | | | | |
|---|---|---|---|---|---|
| Degree | -1.51 | 1.10 | -.07 | -1.37 | .171 |
| Gender (Male) | -4.09 | 2.88 | -.11 | -1.42 | .156 |
| Gender (Female) | -2.26 | 2.57 | -.07 | -.88 | .378 |
| FGS | -.20 | 1.04 | -.01 | -.19 | .846 |
| Age | -.09 | .08 | -.06 | -1.14 | .256 |
| SB | -.06 | .18 | -.06 | -.31 | .757 |
| IP | .61 | .16 | .78 | 3.94 | <.001 |
| IP x SB | -.01 | .00 | -.44 | -2.11 | .036 |

*Note*. IP = Impostor Phenomenon, SB = Sense of Belonging, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

Figure 2 shows the interaction plot between impostor phenomenon and sense of belonging on depression. Examination of the plot showed that as impostor phenomenon increased and sense of belonging decreased, level of depression increased. At the low level of impostor phenomenon, level of depression was highest for low sense of belonging and level of depression was lowest for high sense of belonging. Those with high levels of impostor phenomenon and low levels of sense of belonging had the highest levels of depression.

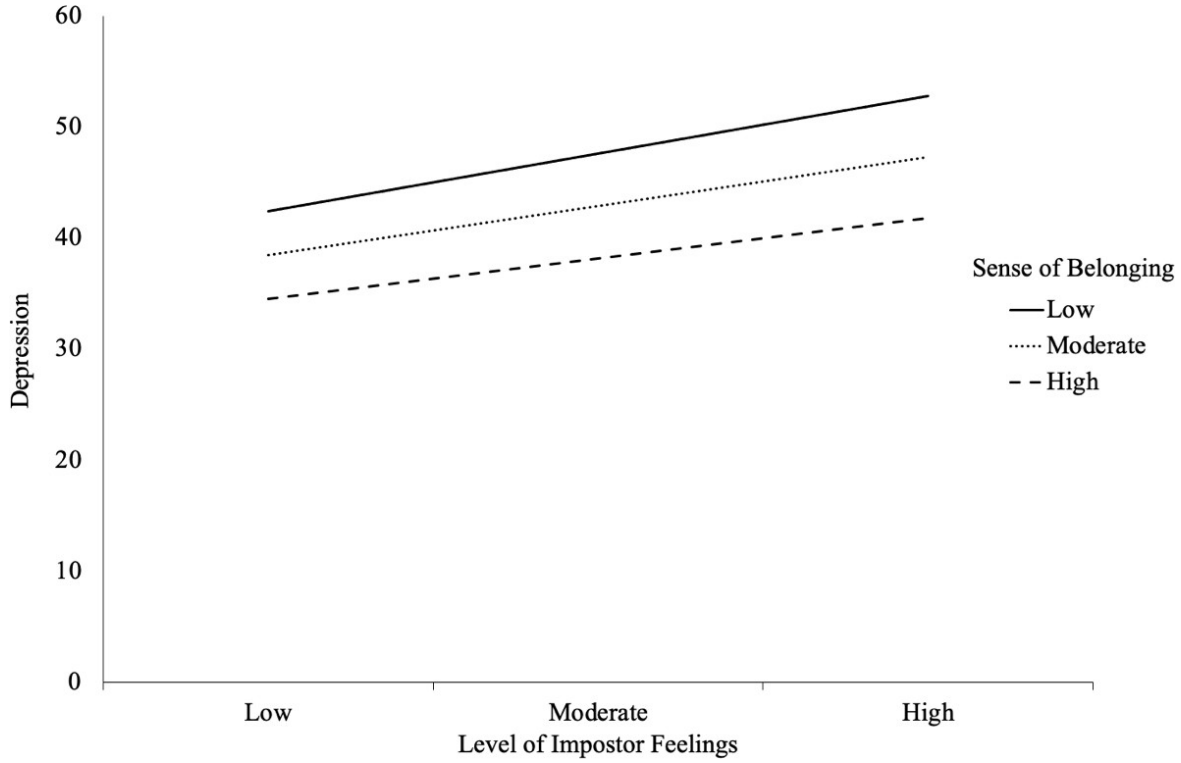



**Figure 4.** Two-way interaction between Impostor Phenomenon and Sense of Belonging on Depression.

*Note:* The levels of impostor phenomenon and sense of belonging were divided into Low, Moderate, and High groups based on values 1 *SD* below the mean, the mean, and 1 *SD* above the mean.

A multiple regression analysis was also run with the five demographic variables and main effects for sense of belonging and impostor phenomenon. None of the covariates were significant: race (White vs. Other) ($\beta$ = .01, $p$ = .790), race (Asian vs. Other) ($\beta$ = -.02, $p$ = .586), degree ($\beta$ = -.07, $p$ = .165), gender (Male vs. Other) ($\beta$ = -.12, $p$ = .127), gender (Female vs. Other) ($\beta$ = -.07, $p$ = .362), first-generation status ($\beta$ = -.00, $p$ = .948), and age ($\beta$ = -.05, $p$ = .295). The main effects for sense of belonging ($\beta$ = -.42, $p$ < .001) and impostor phenomenon ($\beta$ = .37, $p$ < .001) were statistically significant. Please see table 9.

**Table 9.**

*Regression Coefficients for Predicting Depression based on Sense of Belonging and Impostor Phenomenon: Main Effects*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | 52.41 | 5.04 | | 10.40 | <.001 |
| Race (White) | .27 | 1.02 | .01 | .27 | .790 |
| Race (Asian) | -.60 | 1.11 | -.02 | -.55 | .586 |
| Degree | -1.54 | 1.11 | -.07 | -1.39 | .165 |
| Gender (Male) | -4.41 | 2.88 | -.12 | -1.53 | .127 |
| Gender (Female) | -2.35 | 2.58 | -.07 | -.91 | .362 |
| FGS | -.07 | 1.05 | -.00 | -.07 | .948 |
| Age | -.08 | .08 | -.05 | -1.05 | .295 |
| SB | -.43 | .04 | -.42 | -10.42 | <.001 |
| IP | .29 | .03 | .37 | 9.03 | <.001 |

*Note*. IP = Impostor Phenomenon, SB = Sense of Belonging, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

**Hypothesis 3d**

The moderating effect of sense of belonging will differ significantly between Asian, Other, and White participants.

**Results**

To test the hypothesis of whether the moderating effect of sense of belonging differs significantly by race, another multiple regression analysis was conducted. Five demographic variables were included: age, gender, degree, race, and first-generation status. The centered terms for impostor phenomenon and sense of belonging were also part of the model.

In the first analysis, the referent category of race was "Other." None of the covariates were significant: race (White vs. Other) ($\beta$ = .98, $p$ = .448), race (Asian vs. Other) ($\beta$ = .56, $p$ =

.699), degree ($\beta$ = -.07, $p$ = .145), gender (Male vs. Other) ($\beta$ = -.11, $p$ = .172), gender (Female vs. Other) ($\beta$ = -.07, $p$ = .381), first-generation status ($\beta$ = -.01, $p$ = .893), and age ($\beta$ = -.05, $p$ = .309). At the main effect levels, sense of belonging ($\beta$ = .25, $p$ = .482) was not significant, while impostor phenomenon ($\beta$ = 1.05, $p$ = .005) was significant. The interaction term between impostor phenomenon and sense of belonging was significant ($\beta$ = -.81 $p$ = .045). The interaction terms between impostor phenomenon and White race ($\beta$ = -.99, $p$ = .428) and impostor phenomenon and Asian race ($\beta$ = -.69, $p$ = .612) were not significant. The interaction terms between sense of belonging and White race ($\beta$ = -1.14, $p$ = .352) and sense of belonging and Asian race were also not significant ($\beta$ = -.85, $p$ = .531). Lastly, the interaction term between the impostor phenomenon, sense of belonging, and White race ($\beta$ = 1.15, $p$ = .330) and the interaction term between the impostor phenomenon, sense of belonging, and Asian race ($\beta$ = .95, $p$ = .452) were not significant. This indicates that the moderating effect of sense of belonging does not differ significantly between Asian and Other or White and Other participants. Please see table 10.

**Table 10.**

*Regression Coefficients for Predicting Depression based on Sense of Belonging and Impostor Phenomenon, and Race: Main Effects and Three-Way Interactions*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | $t$ | Sig |
|---|---|---|---|---|---|
| Constant | 12.49 | 23.53 | | .53 | .596 |
| Race (White) | 22.07 | 29.09 | .98 | .76 | .448 |
| Race (Asian) | 14.25 | 36.83 | .56 | .39 | .699 |
| Degree | -1.63 | 1.12 | -.07 | -1.46 | .145 |
| Gender (Male) | -3.98 | 2.91 | -.11 | -1.37 | .172 |
| Gender (Female) | -2.27 | 2.59 | -.07 | -.88 | .381 |
| FGS | -.14 | 1.06 | -.01 | -.14 | .893 |
| Age | -.08 | .08 | -.05 | -1.02 | .309 |
| SB | .25 | .36 | .25 | .70 | .482 |

| | | | | | |
|---|---|---|---|---|---|
| IP | .83 | .29 | 1.05 | 2.83 | .005 |
| IP x SB | -.01 | .01 | -.81 | -2.01 | .045 |
| IP x White | -.30 | .37 | -.99 | -.79 | .428 |
| IP x Asian | -.23 | .46 | -.69 | -.51 | .612 |
| SB x White | -.41 | .44 | -1.14 | -.93 | .352 |
| SB x Asian | -.35 | .56 | -.85 | -.63 | .531 |
| IP x SB x White | .01 | .01 | 1.15 | .98 | .330 |
| IP x SB x Asian | .01 | .01 | .95 | .75 | .452 |

*Note*. IP = Impostor Phenomenon, SB = Sense of Belonging, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

In the second analysis, the referent category of race was "White." None of the covariates were significant: race (Other vs. White ($\beta$ = -.91, $p$ = .448), race (Asian vs. White) ($\beta$ = -.31, $p$ = .814), degree ($\beta$ = -.07, $p$ = .145), gender (Male vs. Other) ($\beta$ = -.11, $p$ = .172), gender (Female vs. Other) ($\beta$ = -.07, $p$ = .381), first-generation status ($\beta$ = -.01, $p$ = .893), and age ($\beta$ = -.05, $p$ = .309). The sense of belonging main effect was not significant ($\beta$ = -.15, $p$ = .535) while impostor phenomenon ($\beta$ = .68, $p$ = .020) main effect was statistically significant. The interaction term between impostor phenomenon and sense of belonging was not significant ($\beta$ = -.32, $p$ = .280). The interaction terms between impostor phenomenon and Other race ($\beta$ = .95, $p$ = .428) and impostor phenomenon and Asian race ($\beta$ = .18, $p$ = .883) were not significant. The interaction terms between sense of belonging and Other race ($\beta$ = 1.02, $p$ = .352) and sense of belonging and Asian race were also not significant ($\beta$ = .14, $p$ = .908). Lastly, the interaction term between the impostor phenomenon, sense of belonging, and Other race ($\beta$ = -1.05, $p$ = .330) and the impostor phenomenon, sense of belonging, and Asian race ($\beta$ = -.04, $p$ = .970) were not significant. This indicates that the moderating effect of sense of belonging does not differ significantly between Asian and White or Other and White participants. Please see table 11.

**Table 11.**

*Regression Coefficients for Predicting Depression based on Sense of Belonging and Impostor Phenomenon, and Race: Main Effects and Three-Way Interactions*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | 34.56 | 17.47 | | 1.98 | .049 |
| Race (Other) | -22.07 | 29.09 | -.91 | -.76 | .448 |
| Race (Asian) | -7.82 | 33.17 | -.31 | -.24 | .814 |
| Degree | -1.63 | 1.12 | -.07 | -1.46 | .145 |
| Gender (Male) | -3.98 | 2.91 | -.11 | -1.37 | .172 |
| Gender (Female) | -2.27 | 2.59 | -.07 | -.88 | .381 |
| FGS | -.14 | 1.06 | -.01 | -.14 | .893 |
| Age | -.08 | .08 | -.05 | -1.02 | .309 |
| SB | -.16 | .25 | -.15 | -.62 | .535 |
| IP | .53 | .23 | .68 | 2.33 | .020 |
| IP x SB | -.00 | .00 | -.32 | -1.08 | .280 |
| IP x Other | .30 | .37 | .95 | .79 | .428 |
| IP x Asian | .06 | .42 | .18 | .15 | .883 |
| SB x Other | .41 | .44 | 1.02 | .93 | .352 |
| SB x Asian | .06 | .50 | .14 | .12 | .908 |
| IP x SB x Other | -.01 | .01 | -1.05 | -.98 | .330 |
| IP x SB x Asian | .00 | .01 | -.04 | -.04 | .970 |

*Note*. IP = Impostor Phenomenon, SB = Sense of Belonging, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

In the third analysis, the referent category of race was "Asian." None of the covariates were significant: race (Other vs. Asian) ($\beta$ = -.59, $p$ = .699), race (White vs. Asian) ($\beta$ = .35, $p$ = .814), degree ($\beta$ = -.07, $p$ = .145), gender (Male vs. Other) ($\beta$ = -.11, $p$ = .172), gender (Female vs. Other) ($\beta$ = -.07, $p$ = .381), first-generation status ($\beta$ = -.01, $p$ = .893), and age ($\beta$ = -.05, $p$ = .309). The main effects sense of belonging ($\beta$ = -.10, $p$ = .819) and impostor phenomenon ($\beta$ = .75, $p$ = .092) were not statistically significant. The interaction term between impostor phenomenon and sense of belonging was not significant ($\beta$ = -.34, $p$ = .470). The interaction terms between impostor phenomenon and Other race ($\beta$ = .75, $p$ = .612) and impostor

phenomenon and White race ($\beta$ = -.21, $p$ = .883) were not significant. The interaction terms between sense of belonging and Other race ($\beta$ = .87, $p$ = .531) and sense of belonging and White race were also not significant ($\beta$ = -.16, $p$ = .908). Lastly, the interaction term between the impostor phenomenon, sense of belonging, and Other race ($\beta$ = -1.01, $p$ = .452) and the interaction term between the impostor phenomenon, sense of belonging, and White race ($\beta$ = .05, $p$ = .970) were not significant. This indicates that the moderating effect of sense of belonging does not differ significantly between White and Asian or Other and Asian participants. Please see table 12.

**Table 12.**

*Regression Coefficients for Predicting Depression based on Sense of Belonging and Impostor Phenomenon, and Race: Main Effects and Three-Way Interactions*

| Variables | Unstandardized $\beta$ | Coefficients SE | Standardized Coefficients Beta | *t* | Sig |
|---|---|---|---|---|---|
| Constant | 26.73 | 28.73 | | .93 | .353 |
| Race (Other) | -14.25 | 36.83 | -.59 | -.39 | .699 |
| Race (White) | 7.82 | 33.17 | .35 | .24 | .814 |
| Degree | -1.63 | 1.12 | -.07 | -1.46 | .145 |
| Gender (Male) | -3.98 | 2.91 | -.11 | -1.37 | .172 |
| Gender (Female) | -2.27 | 2.59 | -.07 | -.88 | .381 |
| FGS | -.14 | 1.06 | -.01 | -.14 | .893 |
| Age | -.08 | .08 | -.05 | -1.02 | .309 |
| SB | -.10 | .43 | -.10 | -.23 | .819 |
| IP | .60 | .35 | .75 | 1.69 | .092 |
| IP x SB | -.00 | .01 | -.34 | -.72 | .470 |
| IP x Other | .23 | .46 | .75 | .51 | .612 |
| IP x White | -.06 | .42 | -.21 | -.15 | .883 |
| SB x Other | .35 | .56 | .87 | .63 | .531 |
| SB x White | -.06 | .50 | -.16 | -.12 | .908 |
| IP x SB x Other | -.01 | .01 | -1.01 | -.75 | .452 |
| IP x SB x White | .00 | .01 | .05 | .04 | .970 |

*Note*. IP = Impostor Phenomenon, SB = Sense of Belonging, FGS = First Generation Status. For First Generation Status, 0 = Non-First Generation and 1 = First-Generation and for Degree, 0 = Undergraduate and 1 = Graduate.

**Hypothesis 4**

The level of impostor phenomenon will significantly and positively correlate with the level of fixed mindset.

**Results**

A Pearson correlation coefficient was computed to assess the linear relationship between level of impostor phenomenon and level of fixed mindset. There was no significant correlation between the level of impostor phenomenon and the level of fixed mindset, $r$ [414] = .02, $p$ = .651.

**Supplemental Analyses**

A one-way between-subjects multivariate analysis of covariance was performed on five dependent variables: depression, level of perceived social support, level of impostor phenomenon, level of fixed mindset, and level of sense of belonging, after controlling for age, gender, race, and first-generation status. The independent variable was degree status (Undergraduate or Graduate). The Box's M of 12.11 indicates that the homogeneity of variances and covariances was assumed ($F$ (15, 488682.00) = .796, $p$ = .683). The multivariate result for degree was not significant, Pillai's trace = .022, $F$ (1, 399) = 1.81, $p$ = .110.

The covariate of White was significantly related to the level of perceived social support $F$ (1, 403) = 4.97, $p$ = .026 and the covariate of Asian was also significantly related to the level of fixed mindset, $F$ (1, 403) = 11.07, $p$ < .001. The covariate of Male was significantly related to the impostor phenomenon $F$ (1, 403) = 10.49, $p$ = .001, perceived social support $F$ (1, 403) = 11.61 $p$ < .001, and depression $F$ (1, 403) = 7.38, $p$ = .007. The covariate of Female was

significantly related to perceived social support $F$ (1, 403) = 9.92, $p$ = .002. The covariate of first-generation status was significantly related to sense of belonging ($F$ (1, 403) = 6.85, $p$ = .009) and perceived social support ($F$ (1, 394) = 6.65, $p$ = .010). Age and degree were not significantly related to any of the dependent variables.

# Chapter 4: Discussion

The overall purpose of this study was to investigate the relationships between impostor phenomenon, depression, perceived social support, sense of belonging, mindset, age, degree status, first-generation status, and race within a diverse undergraduate and graduate student population attending a Predominantly White Institution. More specifically, this study was interested in investigating whether perceived social support and sense of belonging moderate the relationship between impostorism and depression. The hypotheses will be discussed in the order that they were presented earlier.

It was hypothesized that the level of impostor feelings would differ significantly between male and female participants, male and nonmale participants, as well as between female and nonfemale participants, when controlling for age, race, first-generation status, and degree. The current data showed that female participants experienced a significantly higher level of impostor feelings than males. This result aligns with some past research findings (Cohen & McConnell, 2019; Cusack et al., 2013; Henning et al., 1998; King & Cooley, 1995; Kumar & Jagacinski, 2006; McGregor et al., 2008) but does not align with some other findings that indicated no significant differences in impostor feelings between males and females (Bernard et al., 2002; Bravata et al., 2019; Cozzareli & Major, 1990; Langford & Clance, 1993; Thompson, 1998). It is clear that more research needs to be conducted to investigate the relationship between gender and impostorism and what factors influence this relationship.

The current data also showed that female, transgender, non-binary, and non-gender-specified students experienced a significantly higher level of impostor feelings than males. To date, no prior studies have examined the impostor phenomenon within transgender or non-binary participants. However, the results found in the current study could be explained by the fact that

transgender and non-binary folks are a gender minority and experience high levels of stigma in a variety of contexts due to their gender (White et al., 2015). Gender stigma consciousness has been found to be significantly associated with impostor phenomenon according to a study conducted by Cokley et al. (2015). Minority stress and gender stigma consciousness may exacerbate feelings of impostorism for transgender and non-binary folks, similar to how these feelings can increase in females when they are in settings where they are the minority or stigmatized (Noskeau & Wang, 2021).

Moreover, it was hypothesized that there would be significant differences in the level of impostor feelings, sense of belonging, and perceived social support, between Asian, Other (African American, Hispanic, Latinx, Middle Eastern, Biracial, and Multiracial), and White participants, when controlling for age, gender, first-generation status, and degree. Data analyses showed that there were no significant differences in the level of impostor feelings across racial groups. Prior to this study, no studies had examined the differences in impostor feelings between Asian, White, and Other (African American, Hispanic, Latinx, Middle Eastern, Biracial, and Multiracial) participants. The current study's findings do however align with those from studies conducted by Brennan-Wydra et al. (2021) and Levant et al. (2020). They found no significant differences in impostor feelings between Under-Represented Minority students and Non-Under-Represented Minority students. However, the current study's findings regarding comparisons between Asian and Other groups don't align with a prior study which found that Asian American undergraduate students experienced a significantly higher level of impostor feelings than African-American and Latinx American groups (Cokley et al., 2012). The academic context may play a role in these differences. For instance, Bernard et al. (2020) found that African-American students who attended PWIs experienced significantly higher levels of impostor feelings

compared to those at HBCUS. There is also a noted pressure of perfectionism on elite college campuses such as Ivy League Institutions, as well as honors colleges (Billings, 2021; Cross et al., 2018), and honors college students have been found to experience a significantly higher level of impostorism than non-honors college students. The mean impostorism score was 74.2 in the current study, which is much higher compared to the mean impostorism score across past studies of impostorism ($M$ = 52.6 - 66.6). The current study also took place at an Ivy League Institution as did Brennan-Wydra's study, whereas the Cokley et al. (2012) study did not take place in such a setting. Thus, it is possible that there were no significant differences in impostorism by race in this particular study because there is an overall higher level of impostorism on top tier and Predominantly White campuses and academic context has more of an impact than race on impostorism for students attending such elite campuses.

The current study also found no significant differences in sense of belonging across racial groups, which is inconsistent with past studies; they have indicated that African-American students are more likely to experience a low sense of belonging, especially at PWIs (Graham & McClain, 2019) and that African American, Asian, and Hispanic undergraduates experience a lower sense of belonging than Caucasian students (Johnson et al., 2007). Current findings may be due to the dynamics present on campus due to COVID-19. Several research studies have found that undergraduate and graduate students have experienced an overall lower sense of belonging on campus due to virtual and hybrid learning during COVID-19, including students who identify as White (Blankstein et al., 2020; Mooney & Becker, 2021; Zuckerman et al., 2021). Thus, an overall lower sense of belonging for all students could explain why there were no differences found by racial group in this study.

However, in the current study, it was found that Asian and Other participants experienced significantly lower levels of perceived social support than their White peers. These results are supported by past research. Hefner and Eisenberg (2009) found that Asian and multi-racial students experienced lower quality perceived social support than their White peers and Negga et al. (2007) found that African-American students attending a PWI experienced lower levels of social support compared to their White peers. Given that the COVID-19 pandemic has disproportionately impacted students of color and their families in a variety of contexts, it is also possible that students of color have felt a lower level of perceived social support from their family, friends, and significant others, compared to their White peers (Lopez-Castro et al., 2021).

It was also hypothesized that impostor feelings and depression would be significantly and positively correlated. The current study found a significant positive correlation between impostor feelings and depression, meaning that as the participants' level of impostor feelings increased, their level of depression also increased. This aligns with past research, which found a positive correlation between impostor phenomenon scores and depression among predominantly White students (McGregor et al., 2008) and African-American students (Austin et al., 2009; Bernard et al., 2017). Furthermore, only two past studies had examined this relationship among Non-White participants, but only included African-American students; this study expanded on past literature by examining the relationship among a more racially/ethnically diverse population.

Additionally, it was hypothesized that perceived social support would moderate the relationship between impostor feelings and depression, which was supported. This finding is supported by several past studies, which found significant relationships between impostor feelings and perceived social support, and perceived social support and depression (Alsubaie et al., 2019; Cohen & McConnell, 2019; Gardner et al., 2018; Whitman & Shanine, 2012; Zhou et

al., 2013). However, race did not significantly affect the moderating relationship, although this was hypothesized. This insignificant finding might be due to there being an overall increase in depression during the pandemic and some studies have found that mental health during this time hasn't significantly differed among ethnic/racial groups (Kecojevic et al., 2020; Trammell et al., 2021).

Next, it was predicted that sense of belonging would moderate the relationship between impostor feelings and depression, and this was also found. Again, this finding is supported by several past studies, which discovered significant relationships between impostor feelings and sense of belonging, and sense of belonging and depression (Graham & McClain, 2019; Stebleton et al., 2014)., Although it was hypothesized that race would moderate the relationship, it did not, which again might be due to an overall increase in depression during the COVID-19 pandemic that hasn't significantly differed across ethnicity/race.

The last hypothesis predicted that impostor feelings and fixed mindset would be significantly and positively correlated. The data from the current study did not support this. This investigation expanded the current literature because previously, this relationship was only examined within working professional or undergraduate student populations. In contrast, the current study examined undergraduate and graduate students' experiences. However, some past research has found significant relationships between these variables. For instance, Kumar and Jagacinski (2006) found that fixed mindset was significantly related to impostor feelings for female college students, but not for male college students. Despite this, it should be noted that this correlation was very weak and that the sample size of female participants in Kumar and Jagacinski (2006)'s study was very small ($N = 42$), which is a significant limitation. In contrast, the current study's sample comprised 360 female participants ($N = 360$). Additionally, Noskeau

and Wang (2021), found that working adults that had a fixed mindset tended to experience more impostor feelings at work. The participants in the current study, however, were likely not all working adults, although this question was not asked during the demographic survey. It is possible that the relationship between level of impostor phenomenon and fixed mindset is different when individuals are working professionals compared to only students. The ages of the samples could have also contributed to the different findings between these studies, as the mean participant age in Noskeau and Wang (2021)'s study was 40 years and the mean age in the current study's sample was 22.94 years.

Supplemental analyses were also conducted to examine differences between undergraduate and graduate students in depression, perceived social support, impostor phenomenon, fixed mindset, and sense of belonging, after controlling for age, gender, race, and first-generation status. There were no significant differences in any of these variables. No prior studies have examined the differences in mindset, impostor phenomenon, perceived social support, or sense of belonging between undergraduate and graduate students. Clearly, more research needs to be done in this area.

In regards to impostorism, there were significant differences by degree status when controlling for age, race, or gender, but there were no significant differences when controlling for first-generation status. Thus, first-generation status appeared to account for more variance in impostorism than the other demographic variables analyzed and contributed to the insignificant finding.

The finding regarding depression aligns with past studies that found no significant differences in depression between undergraduate and graduate students (Atkinson, 2020). However, other studies before and during the pandemic found significant differences. Before the

pandemic, Eisenberg et al. (2013) found that graduate students had significantly lower depression compared to undergraduate students and during the pandemic, Wang et al. (2020) found that doctoral students had significantly less depression than undergraduates and masters' students had significantly less depression than freshmen, sophomores, and juniors. In the current study, analyses were not conducted by specific year of undergraduate program or whether students were from masters or doctoral programs. In regards to Eisenberg et al. (2013), it is possible that the COVID-19 pandemic raised the amount of depression for all participants, leading to nonsignificant differences between graduate and undergraduate students. Furthermore, Eisenberg et al. (2013) examined data from multiple institutions, most of which were public institutions, and Wang et al. (2020)'s study also sampled public university students. Again, academic context may place a role in these inconsistent results.

**Limitations**

There are several limitations in the current study. Firstly, since this was a correlational study, it is not possible to determine cause and effect relationships among variables.

Also, due to the small sample sizes, participants who identified as African American, Middle Eastern, Hispanic, Latinx, Biracial, or Multiracial were coded into one group, labeled "Other." However, it should be acknowledged that the experiences of individuals in the "Other" category are likely not uniform. For instance, Cokley et al. (2012) found that African American students experienced higher minority status stress than Asian American and Latinx American students. Furthermore, Chen et al. (2019) found that African American and Hispanic students experienced a lower level of psychiatric diagnoses than their White peers while Eisenberg et al. (2013) found that Asian, Hispanic, and Multiracial students experienced more severe depressive symptoms than their White peers.

There are several limitations in the sample that affect generalizability. Firstly, the sample was obtained from one Predominantly White Institution (PWI), which limits generalizability to other institutions, particularly non-PWIs. The majority of the sample consisted of participants who identified as female, which makes the results less generalizable to the broader, more gender-diverse population. The average age of the sample was also about 23 years old, so results are not generalizable for all age groups, including adolescents or older adults.

Another limitation is that participants' international student status was not a question on the demographics survey. This would have been helpful information since there may be some differences in the social experiences of international and non-international students that may have influenced the results. For instance, international students may have a lower level of perceived social support from Americans, given that most of their initial support system might be abroad. Chavajay (2013) found that international students perceived a higher level of socioemotional and instrumental support from non-American peers compared to American peers. Thus, if there isn't a large international student body, this may have negative implications for an international students' level of perceived social support. Also, some international students may have difficulties adjusting to the new culture and language in the university environment, which may impact their sense of belonging.

**Future Directions**

Firstly, since this study was conducted during the COVID-19 pandemic, it is possible that results may be lower in generalizability during a time when there isn't a pandemic. This is especially the case given the increase in mental health challenges during this time period.

Because of the insufficient sample sizes based on racial/ethnic groups, unfortunately, Non-Asian and Non-White participants were grouped under one category, "Other." However, it

would be very beneficial for future studies to contain larger sample sizes of participants from several ethnic/racial groups so that examination of differences in impostor feelings by racial/ethnics group can be conducted. In particular, no study has examined differences in impostorism between African-American and Caucasian students or Hispanic/Latinx and Caucasian students, which could help colleges better understand how to best support their student body.

Since the relationship of impostorisn and sexual orientation hasn't yet been investigated it would also be beneficial if future research studies obtained a highly gender-diverse sample, with more transgender, non-binary, and non-gender-identified participants. It is also possible that those without a heterosexual orientation experience lower levels of impostor feelings because they are less influenced by stereotypical gender roles, given what we know about some of the origins of impostorism as it relates to gender.

Future studies should also examine differences in the impostor phenomenon between top tier and lower tier colleges and universities. There may be differences that are solely due to the academic context. Past studies have explored differences between other academic contexts, such as students attending Historically Black College students compared to Predominantly White Institutions, as well as students attendings honors-colleges compared to non-honors colleges and found significant results. Furthermore, it would be helpful for studies to recruit a national sample to see if there are differences in impostorism by region. It is possible that there are higher levels of impostorism in regions of the country where education is the most valued or where the most prestigious universities are located. Also in regards to academic context, differences by discipline could be examined. For instance, researchers could examine students enrolled in typically female-dominated fields versus typically those enrolled male-dominated fields.

Although this study examined depression, other mental health constructs could be analyzed in relation to impostor phenomenon. For example, externalizing symptoms haven't been as extensively examined as internalizing symptoms. Sometimes, depression can result in more externalizing behaviors that may not be well detected through a depression scale.

Also, because of the contradicting results with past research regarding the relationship between impostor phenomenon and fixed mindset, further research should be conducted to examine this relationship. Perhaps mindset of emotions or personalities could be examined instead since some studies have indicated that there may be more of an impact of these types of mindsets on mental health outcomes, compared to the mindset of intelligence. Future studies can also create and study the effectiveness of interventions that target decreasing feelings of impostor phenomenon.

**Implications**

It is clear from this study that impostorism has a significant impact on graduate and undergraduate students' levels of depression, and that sense of belonging and perceived social support can be potential buffers for negative mental health. These results suggest that college campuses should implement interventions that focus on decreasing impostor feelings and increasing social support and sense of belonging. In past research, sense of belonging interventions have shown to be particularly helpful in improving academic outcomes for students of color at a Predominantly White Institution (Walton & Cohen, 2011). Given that Asian American and "Other" students experienced significantly lower perceived social support than their peers in the current study, and the fact that there have been disproportionately negative impacts on students of color as a result of COVID-19, efforts should be made to enhance perceived social support for students on college campuses, especially students of color.

Interventions can be designed in a variety of ways. They can be workshops, seminars, open forums, or support groups. These interventions can have members share experiences with impostorism and help them form healthy coping strategies to manage these feelings. Mentorship programs can be set up for new students to help them adjust to the culture of the school and enhance belonging. It is recommended that mentors within such programs be open about their own negative experiences or mistakes to normalize this for the new students. Faculty and supervisors would benefit students by sharing their own experiences with impostorism and how they have managed the phenomenon. Lastly, it is suggested that mental health clinicians employed at university counseling centers become familiar with the signs of impostor phenomenon so that they can identify when their students are experiencing impostor feelings and intervene in an appropriate manner. Past research has suggested that an integrative approach may be the most effective. Cognitive-behavioral therapy can be utilized to challenge maladaptive thinking patterns while psychodynamic and interpersonal therapy can assist with processing family and social dynamics (Clance & Imes, 1978; McClain et al., 2016).

**Conclusion**

The purpose of this study was to examine the relationship between impostor phenomenon and depression, as well as moderating roles of perceived social support and sense of belonging on this relationship, in a diverse sample of graduate and undergraduate students. Although there is some alignment between current findings and those from past studies, there are also some inconsistencies, which could be partially explained by the unique academic and social context (particularly during the COVID-19 pandemic). The current study provides us with information that can change students' trajectory to severe depression. The study's findings especially indicate

the importance of intervention related to impostor phenomenon on college campuses for all students.

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# Appendix A

Clance Impostor Phenomenon Scale

For each question, please circle the number that best indicates how true the statement is of you. It is best to give the first response that enters your mind rather than dwelling on each statement and thinking about it over and over.

1. I have often succeeded on a test or task even though I was afraid that I would not do well before I undertook the task.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

2. I can give the impression that I'm more competent than I really am.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

3. I avoid evaluations if possible and have a dread of others evaluating me.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

4. When people praise me for something I've accomplished, I'm afraid I won't be able to live up to their expectations of me in the future.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

5. I sometimes think I obtained my present position or gained my present success because I happened to be in the right place at the right time or knew the right people.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

6. I'm afraid people important to me may find out that I'm not as capable as they think I am.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

7. I tend to remember the incidents in which I have not done my best more than those times I have done my best.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

8. I rarely do a project or task as well as I'd like to do it.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

9. Sometimes I feel or believe that my success in my life or in my job has been the result of some kind of error.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

10. It's hard for me to accept compliments or praise about my intelligence or accomplishments.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

11. At times, I feel my success has been due to some kind of luck.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

12. I'm disappointed at times in my present accomplishments and think I should have accomplished much more.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

13. Sometimes I'm afraid others will discover how much knowledge or ability I really lack.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

14. I'm often afraid that I may fail at a new assignment or undertaking even though I generally do well at what I attempt.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

15. When I've succeeded at something and received recognition for my accomplishments, I have doubts that I can keep repeating that success.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

16. If I receive a great deal of praise and recognition for something I've accomplished, I tend to discount the importance of what I've done.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

17. I often compare my ability to those around me and think they may be more intelligent than I am.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

18. I often worry about not succeeding with a project or examination, even though others around me have considerable confidence that I will do well.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

19. If I'm going to receive a promotion or gain recognition of some kind, I hesitate to tell others until it is an accomplished fact.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

20. I feel bad and discouraged if I'm not "the best" or at least "very special" in situations that involve achievement.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

*Note*. From The Impostor Phenomenon: When Success Makes You Feel Like A Fake (pp. 20-22), by P.R. Clance,1985, Toronto: Bantam Books. Copyright 1985 by Pauline Rose Clance, Ph.D., ABPP. Reprinted by permission. Do not reproduce without permission from Pauline Rose Clance, drpaulinerose@comcast.net, www.paulineroseclance.com.

# Appendix B

Multidimensional Scale of Perceived Social Support

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

Circle the "1" if you **Very Strongly Disagree**

Circle the "2" if you **Strongly Disagree**

Circle the "3" if you **Mildly Disagree**

Circle the "4" if you are **Neutral**

Circle the "5" if you **Mildly Agree**

Circle the "6" if you **Strongly Agree**

Circle the "7" if you **Very Strongly Agree**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | There is a special person who is around when I am in need. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | SO |
| 2. | There is a special person with whom I can share my joys and sorrows. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | SO |
| 3. | My family really tries to help me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fam |
| 4. | I get the emotional help and support I need from my family. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fam |
| 5. | I have a special person who is a real source of comfort to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | SO |
| 6. | My friends really try to help me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fri |
| 7. | I can count on my friends when things go wrong. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fri |
| 8. | I can talk about my problems with my family. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fam |
| 9. | I have friends with whom I can share my joys and sorrows. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fri |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 10. | There is a special person in my life who cares about my feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | SO |
| 11. | My family is willing to help me make decisions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fam |
| 12. | I can talk about my problems with my friends. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fri |

The items tended to divide into factor groups relating to the source of the social support, namely family (Fam), friends (Fri) or significant other (SO).

*Note*. From Zimet, G.D., Dahlem, N.W., Zimet, S.G. & Farley, G.K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, *52*, 30-41.

# Appendix C

Psychological Sense of School Membership Scale

1. I feel like a real part of Columbia University.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

2. People here notice when I'm good at something.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

3. It is hard for people like me to be accepted here.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

4. Other students at Columbia University take my opinions seriously.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

5. Most professors at Columbia University are interested in me.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

6. Sometimes I feel as if I don't belong here.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

7. There's at least one professor or staff member in this school I can talk to if I have a problem.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

8. People at this school are friendly to me.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

9. Professors here are not interested in people like me.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

10. I am included in lots of activities at Columbia University.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

11. I am treated with as much respect as other students.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

12. I feel very different from most other students here.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

13. I can really be myself at this school.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

14. The professors here respect me.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

15. People here know I can do good work.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

16. I wish I were in a different school.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

17. I feel proud of belonging to Columbia University.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

18. Other students here like me the way I am.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| (not at all true) | (rarely) | (sometimes) | (often) | (very true) |

*Note*. From Goodenow, C. (1993). The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools, 30,* 79-90.

# Appendix D

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

| | **During the Past Week** | | | |
|---|---|---|---|---|
| | Rarely or none of the time (less than 1 day) | Some or a little of the time (1-2 days) | Occasionally or a moderate amount of time (3-4 days) | Most or all of the time (5-7 days) |
| 1. I was bothered by things that ☐ usually don't bother me. | ☐ | ☐ ☐ | | |
| 2. I did not feel like eating; my ☐ appetite was poor. | ☐ | ☐ ☐ | | |
| 3. I felt that I could not shake ☐ off the blues even with help from my family or friends. | ☐ | ☐ ☐ | | |
| 4. I felt I was just as good as ☐ other people. | ☐ | ☐ ☐ | | |
| 5. I had trouble keeping my ☐ mind on what I was doing. | ☐ | ☐ ☐ | | |
| 6. I felt depressed. | ☐ | ☐ | ☐ | ☐ |

| | | | | |
|---|---|---|---|---|
| 7. I felt that everything I did was an effort. | ☐ | ☐ | ☐ | |
| 8. I felt hopeful about the future. | ☐ | ☐ | ☐ | |
| 9. I thought my life had been a failure. | ☐ | ☐ | ☐ | ☐ |
| 10. I felt fearful. | ☐ | ☐ | ☐ | ☐ |
| 11. My sleep was restless. | ☐ | ☐ | ☐ | ☐ |
| 12. I was happy. | ☐ | ☐ | ☐ | ☐ |
| 13. I talked less than usual. | ☐ | ☐ | ☐ | ☐ |
| 14. I felt lonely. | ☐ | ☐ | ☐ | ☐ |
| 15. People were unfriendly. | ☐ | ☐ | ☐ | ☐ |
| 16. I enjoyed life. | ☐ | ☐ | ☐ | ☐ |
| 17. I had crying spells. | ☐ | ☐ | ☐ | ☐ |
| 18. I felt sad. | ☐ | ☐ | ☐ | ☐ |
| 19. I felt that people dislike me. | ☐ | ☐ | ☐ | ☐ |
| 20. I could not get "going." | ☐ | ☐ | ☐ | ☐ |

SCORING: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

*Note*. From Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385–401. doi: 10.1177/014662167700100306

# Appendix E

### Implicit Theories of Intelligence

Dweck, C. S. (1999). Self-theories: their role in motivation, personality and development. Philadelphia, PA: Psychology Press.

This questionnaire has been designed to investigate ideas about intelligence. **There are no right or wrong answers.** We are interested in your ideas.

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements by writing the number that corresponds to your opinion in the space next to each statement.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly Agree | Agree | Mostly Agree | Mostly Disagree | Disagree | Strongly Disagree |

_____. You have a certain amount of intelligence, and you can't really do much to change it.

_____. Your intelligence is something about you that you can't change very much.

_____. No matter who you are, you can significantly change your intelligence level.

_____. To be honest, you can't really change how intelligent you are.

_____. You can always substantially change how intelligent you are.

_____. You can learn new things, but you can't really change your basic intelligence.

_____. No matter how much intelligence you have, you can always change it quite a bit.

_____. You can change even your basic intelligence level considerably.