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A Comparison of Impostor Phenomenon in Community College and Public University Students

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A COMPARISON OF IMPOSTOR PHENOMENON IN COMMUNITY COLLEGE AND PUBLIC UNIVERSITY STUDENTS

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ABSTRACT

A COMPARISON OF IMPOSTOR PHENOMENON IN COMMUNITY COLLEGE AND PUBLIC UNIVERSITY STUDENTS

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Impostor Phenomenon (IP) is a feeling of illegitimacy or fraudulence despite evidence to the contrary. Most people experience feelings of impostorism in their lifetime, and it has been associated with several outcomes in the literature. Although there is some evidence higher education may facilitate feelings of IP, community college students have been largely excluded from the literature.

The current study expanded the research by examining the prevalence of IP in community college (CC) students and analyzing differences based on demographic variables: gender, under-represented minority (URM) status, first-generation status, Pell Grant eligibility, and disability. Comparisons were made between CC students and students in their first or second year at a public four-year university. The effect of demographic variables and possible interactions were also explored in the total college student sample. The relationships between self-reported grade point averages (GPA), intent to persist, and IP were investigated to see if IP or GPA were predictive of intent to persist.

This study utilized a quantitative non-experimental design to examine survey data. The Clance Impostor Phenomenon Scale (Clance, 1985) and a short demographic questionnaire were given online to 829 participants. The CC students comprised 63.3% of the sample, and they were from three different community colleges. A factorial analysis of variance was selected to examine group differences. A *t*-test was conducted to look at IP differences between CC and

four-year university students, and a multiple linear regression with correlational analyses were utilized to look at the relationships and predictive power of GPA, IP, and intent to persist. Results showed most CC students indicated frequent feelings of impostorism. There were no significant differences between CC and the four-year university students. Students with a diagnosed disability had significantly higher levels of IP in both the CC and the total college student sample. There were also significant differences based on URM. There were no significant interactions. IP was correlated with intent to persist and IP levels were found to have some predictive value for intent to persist; self-reported GPA did not.

This dissertation is dedicated to Malik, Valeria, and Jerry Sr.

I hope you are all proud of me.

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CHAPTER I

INTRODUCTION

According to the National Student Clearinghouse Research Center (NSCRC), only 33.2% of community college students persisted to degree completion (Shapiro, Dundar, Huie, Wakhungu, Yuan, Nathan, & Hwang, 2018). In the Spring of 2019, there was a 1.7% decrease in enrollments across all postsecondary institutions, and two-year public institutions experienced a 3.4% decrease in initial enrollments overall (NSCRC, 2019). According to the State Council on Higher Education for Virginia (SCHEV), 38% of Virginian community college students completed an academic credential or continued as transfer students after four years, and that number represented a 1.3% decrease from the previous year (2018). The spring of 2019 also brought a 1.7% decrease in enrollments for Virginia institutions of higher education (NSCRC, 2019). The completion rates for racial and ethnic minority and disabled college students are even lower than the overall rates (Shapiro et al., 2018). The presence of the impostor phenomenon (IP) may help to explain some of the gaps in degree completion for college students. Feelings of impostorism have been linked to several psychological and behavioral consequences in college students, which could affect persistence to completion (Parkman, 2016).

Impostor phenomenon (IP) refers to a feeling of incompetence even though there is evidence to the contrary (Clance & Imes, 1978). People experiencing IP tend to feel like frauds (Clance, 1985b) and most people will experience IP at some point in their lifetime (Sakulku & Alexander, 2011). Impostorism can cause people to attribute their achievements to luck, hard work, and skill rather than their own intelligence and talent (Chrisman, Pieper, Clance, Holland, & Hughes, 1995). This could result in the inability to internalize their successes (Clance, 1978). To date, there has been little research on the experience of IP in community college students

(Parkman, 2016). Community college students are an important, and traditionally under-examined, part of the higher education community. Community college students are more diverse than traditional four-year students, and community colleges serve students from groups that have been historically under-served by universities. This study examined the presence of IP in community college students and compared them to four-year public university students in their first or second year of study. This should contribute to the literature by including the community college students who have been overlooked and analyzing how they compare to four-year public university students in their first two years of study.

It is possible that the community college's open-door policy leads to lower levels of impostorism. However, because of the lack of research on IP in community college students, assumptions on this issue are not advisable. Measuring impostorism in the college student population should be beneficial for creating more inclusive environments with targeted interventions for students who are at risk (Parkman, 2016). This study may assist college administrators, stakeholders, and researchers in knowing if community colleges and public universities foster environments where students feel like they belong. By measuring IP, and the college students who are more likely to experience it, stakeholders can ultimately work towards increasing student persistence and success.

Background of the Study

Clance and Imes (1978) first recognized the impostor phenomenon in clinical observations with successful female clients. They noticed a reluctance to take credit for accomplishments. The patients would often attribute their successes to luck instead of personal skills or talent (Clance, 1985b). These women were constantly afraid that they would be found out as the frauds they believed themselves to be, and they downplayed their achievements

(Clance & Imes, 1978). Clance (1985b) described a cycle of impostorism. The cycle usually began with an important task. A person suffering with IP would feel increased pressure and stress and as a result, they would either over-prepare or procrastinate. Upon task completion, there would be a short-lived sense of relief. However, any praise or commendation received was explained away as luck or hard work (Clance, 1985b). The end result was an inability to internalize success and excess stress. The cycle would begin again with the next critical project (Clance, 1985b).

Although first identified in women (Clance & Imes, 1978), IP has been found in similar levels in men (Jarrett, 2010; Langford & Clance, 1993). In the literature, people suffering from IP had several psychological and personality characteristics in common (Clance & Imes, 1978). They not only felt self-doubt, but they also had excessive worry, anxiety and fear (Clance & Imes, 1978, Topping & Kimmel, 1985). Research revealed positive correlations between impostorism and neuroticism (Chae, Piedmont, Estadt, & Wicks, 1995), depression (Bernard, Dollinger, & Ramaniah, 2002), perfectionist cognitions with avoidance of imperfections (Ferrari & Thompson, 2006), introversion (Crouch, Powell, Grant, Posner-Cahill, & Rose, 1991), Type A personalities (Hayes & Davis, 1993), and the need to look perfect (Ferrari & Thompson, 2006). It was negatively correlated with conscientiousness and age (Chae et al., 1995; Harvey, 1981; Bernard, Dollinger, & Ramaniah, 2002). Impostorism was positively associated with decreased motivation and lack of confidence (Chrisman, Pieper, Clance, Holland, & Glickauf-Hughes, 1995; Clance, 1985b; Bernard, Dollinger, & Ramaniah, 2002). Individuals who felt like impostors demonstrated a fear of failure, but they also feared success and the expectations that it would bring (Henning, Ey, & Shaw, 1998; Leary, Patton, Orlando, & Funk, 2000; Thompson, 1998).

In addition to psychological consequences, IP was also associated with several behavioral outcomes. Higher levels of impostorism have been connected to refusal of advancement opportunities and a devaluation of performance (Clance et al., 1995; Kets de Vries, 2005). Self-handicapping was related to feelings of impostorism as was procrastination (Clance, 1985b; Henning, Ey, & Shaw, 1998). Self-handicapping is defined as "protecting one's self-image with behaviors that create a handy excuse for later failure" (Myers & Twenge, 2017, p. 55). Higher levels of IP were associated with the need to look perfect and avoid any semblance of imperfections (Ferrari & Thompson, 2006). As a result, impostors were less likely to volunteer for advancement opportunities for fear of being found out as a fraud (Clance & O'Toole, 1988). They also constantly self-monitored to make sure they were presenting themselves in the best light possible (Ferrari & Moderski, 1995; Kets de Vries, 2005). In relationships, people with higher levels of IP showed anxious attachment styles and a perceived sense of entitlement (Gibson-Beverly & Schwartz, 2008).

Parkman (2016) documented impostorism in higher education and showed it had the potential to negatively affect the retention of not only students but also faculty and staff. A negative correlation between feelings of IP, self-esteem, and college success was identified in the literature (Lige, Peteet, Brown, 2017). The higher education environment lends itself to feelings of inadequacy and impostorism, and students are at an increased risk for IP because of the atmosphere (Parkman, 2016; Topping & Kimmel, 1985). Students are constantly evaluated by faculty, staff, and peers. Impostorism was shown to be related to increased stress and anxiety about academic performance (Sakulku & Alexander, 2011).

In student populations, Parkman (2016) also found a significant relationship between IP and mental health. It was found to be significantly associated with depression (Harvey & Katz,

1985; Thompson, 1998) and psychological distress (Henning, Ey, & Shaw., 1998). Henning, Ey, and Shaw (1998) found that impostorism was the strongest predictor of psychological distress in their study of college students. It is essential to understand the prevalence of IP in different student populations.

Not only has IP been shown to have negative consequences in post-secondary education, but it also has the potential to affect student well-being in many ways. Students higher in impostorism felt more shame and guilt. For students at four-year colleges, IP has been correlated with lower self-esteem, depression, stress, anxiety, psychological distress, and maladjustment (Clance & Imes, 1978; Cowman & Ferrari, 2002; Cokley, McClain, Enciso, & Martinez, 2012). Impostorism has also been linked with negative academic outcomes, differences in achievement orientations, and perfectionism in students (Ferrari & Thompson, 2006; King & Cooley, 1995; Thomason, Davis, & Davidson, 1998). Students with more impostorism felt less disciplined and less capable (Bernard, Dollinger, & Ramaniah, 2002).

Certain student populations have been shown to have higher levels of impostorism. Male students and students with more masculine traits had lower IP scores (French, Ullrich-French, & Follman, 2008; Oriel, Plane, & Mundt, 2004). September, McCarrey, Baranowsky, Parent, and Schindler (2001) discovered that masculine traits were associated with more confidence and well-being in higher education. First generation students and underrepresented minority students have been shown to have higher levels of impostorism also (Harvey & Katz, 1985; Martin, 2018; Peteet, Brown, Lige, & Lanaway, 2015). Martin (2018) revealed that 90% of first generation female undergraduate students experienced impostor feelings, and almost half experienced frequent feelings of IP. Peteet, Brown, Lige, and Lanaway (2015) found that IP predicted self-esteem and psychological distress in African American college students. Graduate students

demonstrated higher levels of IP in the research also (Clancy, 2013; Gibson-Beverly & Schwartz, 2008). Students who externalized successes and internalized failures had more negative emotions and more harsh self-evaluations (Thompson, Davis, & Davidson, 1997).

There are three measures utilized to measure IP in the literature. Chrisman, Pieper, Clance, Holland, and Glickauf-Hughes (1995) assessed the differences between the three scales and provided validation for the Clance Impostor Phenomenon Scale (CIPS) which was utilized in most of the literature. Chrisman et al. (1995) showed the validity of the CIPS using both construct and discriminate validity. The reliability of the scale was also demonstrated in the literature (Chrisman et al., 1995). The Harvey Impostor Phenomenon Scale (HIPS) (Harvey, 1981) and the Perceived Fraudulence Scale (PFS) (Kolligian & Sternberg, 1991) are the other two measures developed to assess the impostor phenomenon. Both the HIPS and PFS are longer and take more time to complete. In addition, scores on the CIPS strongly correlate with both the HIPS and PFS (Chrisman et al., 1993). The CIPS also had the most internal consistency findings (Clance, 1985b).

Statement of the Problem

In a time when enrollment in higher education is declining, and persistence to completion is the objective, it is imperative to consider any and all factors that can affect admission, continuation, and graduation. Impostorism has been associated with several personality, psychological, and behavioral outcomes that may affect student success. It is essential to examine the rates of IP in students at community colleges and public four-year institutions to see which students have the highest levels of IP and to determine how they can be best served by the institutions they have chosen to attend. It is also important to note that there is a lack of research on impostorism in community college students, and a high proportion of under-represented racial

and ethnic minority group students will start their postsecondary education at a community college (SCHEV, 2018). As a result, there is a gap in our understanding of how impostorism affects students at different types of institutions, and there could be consequences for school choice if significant differences between community colleges and the public four-year university are discovered. If students felt more impostorism at the 4-year public institution than at the community college, then students may be more apt to attend the community college.

Purpose of the Study

The purpose of this study was to examine impostorism among Virginian community college students and students who are in their first or second year at four-year public universities. Using the Clance Impostor Phenomenon Scale (CIPS), this non-experimental quantitative study compared impostorism scores for community college students to the scores of first- and second-year public four-year university students. Additionally, the study explored whether variables such as under-represented racial/ethnic minority group status, first generation status, Pell Grant eligibility, or disability status affected the CIPS scores of college students. Finally, the relationship between IP scores, self-reported grade point average (GPA), and intent to persist was examined. In addition, self-reported GPA and impostorism scores were evaluated for their ability to predict intent to persist.

Research Questions

The research will be guided by the following questions:

1. What are the levels of impostorism in Virginia community college student populations?
2. Are there statistically significant differences in CIPS scores between community college students based on demographic characteristics: Specifically, (a) under-

represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status.

3. Are main effect demographic differences in CIPS scores qualified by interactions between different demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?
4. Is there a statistically significant difference in CIPS scores between community college students and students in their first or second year at a public four-year university?
5. Are there statistically significant differences in the CIPS scores between community college students and students in the first or second year at a public four-year university based on demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?
6. Are main effect demographic differences in CIPS scores qualified by interactions between community college students and students in the first or second year of study at a four-year public university based on the type of institution and demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?
7. Is there a significant relationship between impostorism scores, self-reported GPA, and intent to persist at the current institution of higher education?
8. Does level of impostorism or self-reported GPA predict intent to persist?

Significance of the Study

This study will offer some insight into the feelings of impostorism in college students. The literature has indicated IP has the potential to negatively impact student performance and overall well-being (Parkman, 2016). However, the majority of this research has been with students in four-year intuitions and there is very little research with students enrolled in community colleges, leaving a gap in our knowledge (Parkman, 2016). This study adds to the literature by exploring IP in a population of students that has been largely overlooked.

Better understanding of impostorism in the college student population could be beneficial in creating more inclusive environments with targeted interventions for students who are in jeopardy (Parkman, 2016). This study should be informative to college stakeholders and researchers in knowing whether community colleges foster an environment where students feel more authentic and recognized for their talents and abilities.

College enrollments are declining and less than half of community college students are persisting to degree completion (NSCRC, 2019). It is necessary to examine the institutional environments for places where students may struggle. By comparing a four-year public institution to a community college, stakeholders at both types of institutions may begin to better understand what can be done to foster student psychological well-being and future success. By examining the demographic groups that are most likely to feel like they are frauds in post-secondary education, institutions can look at the structures and programs they have in place that may or may not be working well for their students. Finally, examining the intersectional identities of students and how they may foster or protect against feelings of impostorism could potentially help increase retention and completion for the most at-risk student groups and that should be the goal of all institutions of higher education.

Overview of the Methodology

I utilized a non-experimental quantitative methodology to gather data. The Clance Impostor Scale (CIPS) was utilized to measure the existence of impostorism in Virginian community college and public four-year university students. The CIPS is the most widely used measure of IP and it has been validated and normed on several populations in the literature (Chrisman et al., 1995). Demographic information was also collected and analyzed. The result was a non-experimental quantitative examination of impostorism in Virginian college students. The influence of IP and selected demographic variables was also evaluated in the college student sample. In addition, the relationships between IP, GPA, and intent to persist were explored with further analysis of the capacity of IP and GPA to predict intent to persist.

Prior to data collection, approval for the study was obtained from the Darden College of Education and Professional Studies Human Subjects Review Committee at Old Dominion University and each review committee from the three community colleges selected. Students were recruited to participate in this study via email, and all students who completed the survey were included in the study. The only qualification was that the participants must be a college student who is eighteen or older. Dual enrollment students were excluded from the study. The survey invitations were sent from the principal investigator. The initial recruitment email went to all students and included an explanation of the study, confidentiality, and the consent procedures. The consent was collected electronically and was included at the beginning of the Qualtrics survey. Instructors and institutions did not have access to survey data. Only the research team which was composed of Shanda Jenkins and Dr. Williams had access to survey data. It was expected that completion of each survey would take 10 minutes or less. In the consent form, the participants were informed about the purpose of the study and a brief description of the research

being conducted. In addition, the risks and benefits of taking part in the study were detailed in the consent form, as was the voluntary nature of the study. Participants were given the option to include their personal information in order to be included in the gift card drawing. Repeat invitations and reminders were sent out at least one more time over the span of a month to recruit participants.

Both the CIPS and the demographic questionnaire were administered to students via Qualtrics. A link was emailed to all students. The CIPS has a Likert scale ranging from 1 ("not at all true") to 5 ("very true") (Clance, 1985). The numbers were added together for each of the twenty items and scores ranged from 20 to 100 (Clance, 1985). On the CIPS, scores of 41-60 indicate moderate levels of impostorism, 61-80 show frequent IP feelings, and 81 and above indicate frequent feelings of impostorism (Clance, 1985). The demographic variables selected for analysis were under-represented racial/ethnic minority status, Pell Grant eligibility, disability, and first-generation status. A factorial analysis of variance (ANOVA) was utilized to detect significant group differences and interactions. Descriptive statistics which included group means and standard deviations were obtained to summarize and describe the data. An independent samples *t*-test was used to identify differences in impostorism between community college and public university students in their first or second year of study. Additionally, a correlational analysis was done to examine the relationships between GPA, IP scores, and intent to persist. Finally, a linear regression was utilized to look at the ability of GPA and IP to predict intent to persist in both community college and public four-year university students in their first or second year of study.

Delimitations

The first delimitation was that the study focused on a sample of three community colleges and one four-year public university which was a small select number of institutions. As such, they may not be representative of the larger community college or public four-year university student populations. Secondly, only volunteer data were utilized. As a result, people who participated may have been different from those who chose not to. Having a self-selected sample and only analyzing one construct with demographic characteristics limited the scope of the study. The study was confined to Virginia college students also. There was a constraint of three community colleges and one four-year public university. Although there were three available measures of impostorism, this study was limited to scores on a single measure. The literature has linked IP to several things including personality, psychological, and behavioral outcomes, however, none of these were analyzed in this study.

Definition of Key Terms

The following key terms were used in this study:

- *Clance Impostor Phenomenon Scale*: A self-reporting 20-item survey that measures feelings of impostorism in respondents (Chrisman et al., 1995).
- *Disabled Student*: A student who self-reports being diagnosed with a physical, psychological, or learning disability.
- *First-generation College Student*: A student whose parents have not earned a 4-year college degree (Martin, 2018).
- *Impostor*: A person who experiences the impostor phenomenon (Clance, 1978).
- *Impostorism*: the experience of the impostor phenomenon. Feeling like successes are the result of luck or effort instead of personal ability and talent (Clance, 1978).

- *Impostor Phenomenon*: the psychological experience of feeling like a fake or phony. Feeling as if successes are the result of luck or effort instead of personal ability and talent (Clance, 1978).
- *Pell Grant Eligible*: Students who qualify for the federal Pell Grant which is based solely on financial need.
- *Under-represented Racial and Ethnic Minority*: A student who self identifies as African American, Asian, Non-White Hispanic, Native American, Pacific Islander, Multi-Racial, or Other.

Summary

With the information known about impostor phenomenon and its potential impact on student success, it is vital to better understand this construct and how it affects all post-secondary students and institutions. Because individuals who experience IP feel like frauds and constantly fear being discovered as less intelligent or competent than they appear to be, post-secondary institutions must create ways to validate students and their experiences (Clance & Imes, 1978). The culture of higher education with its frequent evaluations and perceived hierarchies can lend itself to feelings of impostorism in students and faculty (Parkman, 2016). It is important that college stakeholders better understand impostor phenomenon, which students are most vulnerable to it, and the ways that institutions of higher education can take steps to eradicate it.

CHAPTER II

LITERATURE REVIEW

The literature review is divided into five research areas relating to impostor phenomenon (IP). It starts with a general discussion of IP, its definition, when it was identified, its prevalence, how it develops, and how it is measured. The review then synthesizes some of the empirical research on the characteristics of IP, the outcomes of IP, and IP in higher education. Finally, the review concludes with an analysis of the gaps in the research with a particular focus on studies related to the research questions.

Method of Literature Review

The review of literature took place over several months and included a variety of sources and search engines. The library databases at Old Dominion University, Norfolk State University, and Thomas Nelson Community College were searched. In addition, Google Scholar was also utilized to obtain some open resources that did not require subscriptions. The search terms varied, and some Boolean Search operators were utilized to narrow the focus of the results. The preliminary searches included the term "Impostor Phenomenon". However, later searches were also conducted using "Imposter Phenomenon", "Impostor Syndrome", and "Impostorism" in an attempt to review most of the literature on IP. Although, most of the focus was on peer reviewed journal articles, books and a couple non-peer reviewed sources were also examined. A few dissertations were cited as well as some popular non-academic resources like the *Chronicle of Higher Education* and *Psychology Today*. A couple of interviews were also cited. The combination searches included IP and students, community college, race, ethnicity, socioeconomic status, first generation students, gender, disability, Pell Grant, persistence, and

grade point average (GPA). The research on IP was not limited to students in the United States and a few International journal articles were included in the review

In addition to the research on impostorism, research on student outcomes was also examined. The U.S. Department of Education, National Center for Education Statistics (NCES) was searched, and several reports were retrieved for data cited in this literature review. More specifically, information on student outcomes were reviewed based on gender, racial and ethnic minority status, disability, first generation status, and Pell Grant eligibility. Student outcomes were also accessed in community college students overall, and by the same demographic information as the four-year university students. Higher Education legislation was also consulted and referenced to better understand the literature as well as student access and success in post-secondary education.

Purpose

The purpose of this study is to examine impostorism among Virginian community college students and similar students who are in their first or second year at four-year public universities. Using the Clance Impostor Phenomenon Scale (CIPS), this non-experimental quantitative study will compare impostorism scores for community college students to the scores of first- and second-year public four-year university students. Additionally, the study will explore whether variables such as race/ethnicity, first generation status, Pell Grant eligibility, and disability status affect the CIPS scores of community college students.

Impostor Phenomenon: Definition, Prevalence, and Foundational Research

Impostor phenomenon (IP) refers to the feeling of incompetence even though there is external evidence of success (Clance & Imes, 1978). People who experience IP tend to attribute their achievements to luck and skill rather than their own intellect and talent (Chrisman, Pieper,

Clance, Holland, & Hughes, 1995). Clance and Imes (1978) described it as the feeling that one is intellectually inept despite evidence to the contrary. People who suffer from IP feel phony (Clance, 1978). The experience of IP is common. Many high achieving individuals have reported feeling like impostors. One prominent researcher, Dr. Kevin Cokley, summed it up well in an interview for the New York Times. He said, "I felt like an impostor; I felt like people were looking at me and that I was going to be found out as not belonging there" (Wong, 2018, para. 10).

Joan Harvey (1981) developed the widely used Harvey Impostor Scale (HIPS) and also wrote extensively about impostorism, its definition, and its implications (Harvey & Katz, 1985). Harvey and Katz (1985) described an impostor as someone who:

> knows he has worked hard for his success. Yet, he feels 'I am nothing but an impostor and a fake. I don't deserve my success; I haven't really earned it. I've been fooling other people into thinking I'm a lot smarter and more talented than I really am.' (p. 3)

The authors noted that pronoun *he* was used to represent both men and women without the intention of any sexual bias (Harvey & Katz, 1985).

Prevalence

Michelle Obama (2018, December 4) said "I still have a little impostor syndrome, it never goes away…that feeling that you shouldn't take me seriously…We all have doubts in our abilities, about our power and what that power is" (para. 1). According to Sakulku and Alexander (2011), an estimated 70 percent of people will experience IP at some point in their lifetime. Subani, Huebert, Crowley, and Das (2019) stated "most people with impostor feelings suffer in silence given that the core of impostorism is a fear of being 'found out'" (p. 30).

Bravata, Watts, Keefer, Madhusudhan, Taylor, Clark, Nelson, Cokley, and Hagg (2019) conducted a systematic review of the prevalence, predictors, and treatment of IP. They considered 284 peer-reviewed studies for inclusion. Ultimately, they analyzed 66 articles which described 62 studies conducted between 1990 until 2018 (Bravata et al., 2019). The studies were conducted in the United States, Canada, Austria, Australia/New Zealand, Germany, Iran, the United Kingdom, Belgium, and Korea. When looking at prevalence of IP, they found varied results depending on the scale utilized and the preset cutoff to determine symptoms (Bravata et al., 2019). Although most of the research utilized the Clance Impostor Phenomenon Scale, six studies used the Harvey Impostor Phenomenon Scale, one used the Perceived Fraudulence Scale, two studies used the Leary Imposter Scale, and two used self-developed scales (Bravata et al., 2019). The results varied widely and ranged from 9 to 82% of participants experiencing feelings of impostorism, largely depending on the scales and cutoffs used to determine significant IP (Bravata et al., 2019). Of note, none of the studies included community college student populations (Bravata et al., 2019).

Impostorism is pervasive and it has been associated with several negative mental health consequences (Chae, Piedmont, Estadt, & Wicks, 1995; Fried-Buchalter, 1997; Sonnak & Towell, 2001). Research has examined the presence of IP in many different groups of people, and several studies have examined its widespread presence in higher education (Gibson-Beverly & Schwartz, 2008; Parkman, 2016; Thompson, Davis, & Davidson, 1997). It has also been widely observed in high achieving individuals (Clance & Imes, 1978; Gottlieb, Chung, Battaglioli, Sebok-Syer, & Kalantari, 2020; Levant, Villwock, & Manzardo, 2020). Gottlieb et al. (2020) in their review of studies found that up to sixty percent of physicians and physicians in training experienced IP.

It is important to note the high prevalence of impostorism may be the result of some publication bias because there may be a tendency to publish studies with findings endorsing feelings of being an impostor (Bravata et al., 2019). In their systematic review of the literature on IP published between 1966 and 2018, Bravata et al. (2019) found all the studies described at least some participants reporting feelings of impostorism. The absence of research reporting no IP implies some publication bias (Bravata et al., 2019). Either way, impostorism is an experience that has been widely studied and seems to be fairly common in higher education settings and in high achieving individuals.

Foundational Research

Impostor Phenomenon (IP) first appeared in the literature in the late 1970s (Clance & Imes, 1978). Clance and Imes (1978) observed it in therapy sessions with high achieving women. Clance and Imes (1978) observed that many successful women believed they were not smart and had fooled others into believing otherwise. The women felt they would be found out and so they tried to avoid detection as the frauds or impostors they believed themselves to be. They tended to credit their successes to external causes or luck (Clance & Imes, 1978).

Harvey (1981) examined the relationship between impostorism self-monitoring, thoughts about self-presentation, and the social contexts where successes happen. She describes how impostors are overly concerned with how they appear to others. They are extremely sensitive to all cues that involve the self (Harvey, 1981). As a result, they constantly monitor themselves in the presence of others. Harvey also hypothesized that those high in IP tended to see the contexts where they obtained their achievements as ambiguous which reinforced their feelings of impostorism (Harvey, 1981). The true impostor held the perception that there were multiple causes for their achievements which increased the ambiguity of the contexts and led to

attributional confusion (Harvey, 1981). According to Harvey, the inability to internalize successes is what really separated impostors from others (1981). Those suffering from IP often attributed their accomplishments to things like the assets they possess, their interpersonal behaviors, or demographic characteristics associated with identity (Harvey, 1981).

Development of Impostor Phenomenon. According to Clance (1985b) family environment plays a role in the development of IP. A positive correlation was found between impostorism and family conflict (Bussotti, 1990). More specifically, parents have a large influence on how children see themselves. Links have been discovered between parental over protection and increased feelings of impostorism (Bussotti, 1990; Sonnak & Towell, 2001; Want & Kleitman, 2006). Parents that emphasize achievement, promote competition, and give inconsistent messages about academic success tend to have children who score higher in levels of impostorism (King & Cooley, 1995). Clance (1985b) discussed the role that families play in the experience of impostorism; they stated

> Many of our fundamental views about ourselves…began with our families and how our parents and/or siblings saw us and how they conveyed what they saw. These messages given to us when we are very young, stay with us and have a profound effect on the self-image we develop (Clance, 1985b, p. 32).

Children who feel their parents care and have cohesive families that are expressive tend to suffer less from feelings of impostorism (Bussotti, 1990; Sonnak & Towell, 2001; Want & Kleitman, 2006).

The Cycle of Impostor Phenomenon. One important aspect of IP identified by Clance (1985b) was the presence of a cycle. The Impostor Cycle was usually triggered by a challenging task or assignment that was connected to some measure of success. People with high levels of IP

felt increased levels of anxiety, pressure, and stress. As a result, they either procrastinated on the task or the extreme opposite, they prepared too much (Clance, 1985b). When the task or assignment was completed impostors felt a sense of relief and accomplishment. Unfortunately, those feelings did not last. They began to see the positive feedback they received as related to their hard work or even luck. They did not credit their intellect or personal abilities (Clance, 1985b). Consequently, when another achievement related task was presented, the cycle started again.

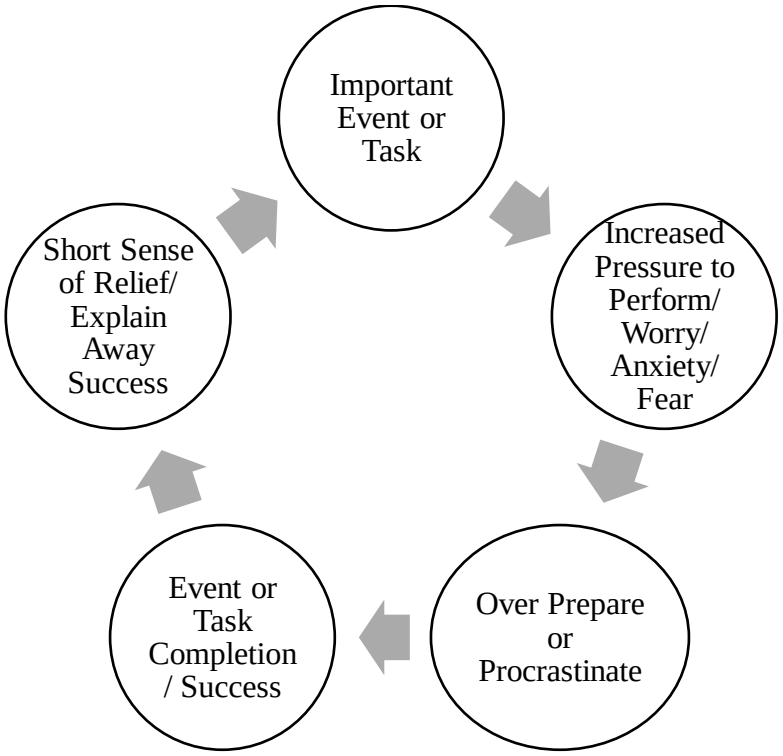

Figure 1. Diagram depicting the Impostor Cycle based on Clance (1985b)

Measuring the Impostor Phenomenon

Since its discovery, several scales have been developed to measure IP. Chrisman, Pieper, Clance, Holland, and Glickauf-Hughes (1995) examined the differences between the three most commonly used scales and provided validation for the Clance Impostor Phenomenon Scale (CIPS), which was utilized in most of the literature. The Chrisman et al. (1995) study provided both construct validity and discriminant validity for the CIPS. The discriminate validity was based on comparisons with measures of "psychological well-being, depression, self-esteem, self-monitoring, and social anxiety" (p. 458). The goal was to discriminate IP from general negative affect. With a sample of 269 undergraduate students Chrisman et al. (1995) found an internal reliability of α=.92 for the CIPS. Scores on the CIPS correlated strongly with scores on the Perceived Fraudulence Scale (PFS) and The Harvey Impostor Phenomenon Scale (HIPS). Finally, their analysis showed IP was related to several constructs; however, it could be substantially differentiated from depression, self-esteem, social anxiety, and self-monitoring (Chrisman et al., 1995).

Mak, Kleitman, and Abbott (2019) did a systematic review of impostor phenomenon measurement scales. They assessed the quality of several impostorism scales with a framework they developed to assess the quality of the instruments in clinical and research settings. They searched empirical studies examining the "conceptualization, development, or validation of self-report impostor phenomenon scales" (Mak et al., 2019, p. 1). They analyzed the four most common scales which included the CIPS, the Harvey Impostor Scale, the Perceived Fraudulence Scale, and the learn Impostor Scale. They started with 716 potential studies and ended with 18 studies that met the criteria for inclusion. It is important to note that some of the criteria included being published in the English language, reporting psychometric data on the IP measure and

using an adult sample. Overall, they found good ratings for internal consistency in the scales. They were not able to determine a criterion validity because there is no established standard with which to compare (Mak et al., 2019). The studies that utilized more than one scale, found high correlations between scores. However, the studies did not examine repeated measures and did not retest after any time period. Mak et al. (2019) concluded that the scales showed adequate psychometric properties and could be trusted as valid measures of the construct. However, they noted several holes in the research including lack of longitudinal studies and qualitative data (Mak et al., 2019).

Leonhardt, Bechtoldt, and Rohrmann (2017) looked at whether impostor phenomenon was a homogeneous construct or if there were different types of impostors. They found there were two basic types of impostors. They suggested there were some "true impostors" which had mostly unfavorable traits, and there were "strategic impostors" which were described as less hindered by self-doubt (Leonhardt et al., 2017). The true impostors were plagued by negative self-views and high levels of anxiety. They also showed high levels of perfectionism and procrastination. On the other hand, strategic impostors were not excessively anxious and did not display more dysphoria. They had positive emotions and good self-evaluations. It is important to note that there were not significant differences between the overall IP scores between the true and strategic impostors (Leonhardt et al., 2017). They concluded "persons with impostor self-concept form a heterogeneous group and the construct need to be considered in a more differentiated way" (Leonhardt et al., 2017, p. 8).

Impostor Phenomenon and Demographic Characteristics

There have been connections revealed between impostorism and certain demographic characteristics in the literature. More specifically, there has been some evidence that gender,

race, and age may impact feelings of impostorism (Clance, 1985b; Bravata et al., 2019; Lige, Peteet, & Brown, 2017). Although the findings on gender have been mixed, there is some evidence that women may experience feelings of IP at higher levels than men (McGregor, Gee, & Posey, 2008). In addition, members of under-represented minority groups may also experience higher levels of impostorism (Graham & McClain, 2019; Lige et al., 2017; Wei, 2020;). Finally, the literature has indicated that age impacts impostorism and older individuals tend experience less IP (Harvey, 1981).

Gender

When Clance (1978) first identified the impostor phenomenon, she analyzed it primarily in women (Clance, 1985b). However, subsequent research has had mixed results. Many studies have failed to find significant differences in impostorism between men and women (Clance & O'Toole, 1987; Jarrett, 2010; Langford & Clance, 1993). However, McGregor, Gee, and Posey (2008) found higher IP scores in women compared to men. Additionally, negative correlations have been found between masculine traits and impostorism indicating that masculinity may be protective against IP (French, Ullrich-French, & Follman, 2008). Increased levels of confidence associated with more masculine traits were also related to lower levels of IP (September, McCarrey, Baranowsky, Parent, & Schindler, 2001).

Bravata et al. (2019) analyzed thirty-three articles that looked at gender differences in impostorism. They determined that sixteen of the studies found that women had significantly higher rates of IP when compared with men. However, seventeen studies did not find any statistically significant differences (Bravata et al., 2019). One study found men and women cope with their feelings of impostorism differently, but another found gender differences in students but not among professionals (Bravata et al., 2019). Conversely, Vaughn, Taasoobshirazi, and

Johnson (2020), found academic women showed elevated levels of IP which was related to motivation and attributions for success and failure.

Under-Represented Racial Minorities

There have been several studies analyzing impostorism in under-represented ethnic and racial minority groups (Graham & McClain, 2019; Le, 2019; Wei, Liu, Ko, Wang, & Du, 2020). Many of the studies have focused specifically on college students of color. Regardless of the sample groups, the findings have indicated under-represented minorities may experience higher levels of IP especially in higher education settings. Interestingly, Asian Americans may experience higher levels of impostorism than do African American or Hispanic populations; however, they all experience more impostorism than do European Americans (Cokley, McClain, Enciso, & Martinez, 2012; Cokley, Smith, Bernard, Hurst, Jackson, Stone, Awosogba, Saucer, Bailey, & Roberts, 2017).

Cokley et al. (2012) looked at feelings of impostorism in African American, Latino/a, and Asian American college students, they found that Asian American students reported the highest levels of impostorism and the highest grade point averages (GPAs) at the same time. There were no significant differences between African American and Latino/a students. Wei et al. (2020) also found significantly higher IP scores for Asian American students. Overall, the IP scores of minority students of color tend to be significantly higher than those of European American students (Cokley et al., 2012; Cokley et al., 2017; Graham & McClain, 2019).

One reason why racial and ethnic minority students may experience higher levels of impostorism could be because of racial discrimination. Bernard, Jones, and Volpe (2020) asserted that Black students must negotiate unique stressors as they forge their identities. These can include but are not limited to “racial discrimination, isolation and alienation, hostile campus

climates, limited institutional resources, interpersonal race-related stressors…and concerns of family/community disconnect (Bernard et al., 2020, p. 196). In an analysis of racial discrimination, racial identity, and IP in African American college students, Bernard, Hoggard, and Neblett (2017) found racial discrimination predicted higher levels of impostorism. Peteet, Montgomery, and Weekes (2015) also found racial identity to be significantly predictive of IP scores. Minority students with higher racial or ethnic identity experienced lower levels of impostorism. However, racial identity did not alleviate the weighty impact of the racial discrimination on IP (Bernard et al., 2017). Bernard et al. (2017) affirmed "evidence suggests that IP may be particularly salient within settings that are predominantly non-Black" (p. 197).

Impostor Phenomenon and Mental Health

Impostor phenomenon has been associated with several negative mental health consequences in the literature. More specifically, there have been psychological concerns which have included both personality characteristics and behavioral outcomes associated with increased levels of impostorism (Kets de Vries, 2005; Leary, Patton, Orlando, & Funk, 2000; Thompson, Davis, & Davidson, 1997).

Psychological Outcomes

Those higher in IP were more likely to experience increased psychological discomfort and decreased overall mental health (Henning, Ey, & Shaw, 1998). They had increased levels of self-doubt and negative self-concepts which resulted in lowered self-esteem (Kets de Vries, 2005; Leary, Patton, Orlando, & Funk, 2000; Thompson, Davis, & Davidson, 1997). Impostorism was positively correlated with a fear of failure (Leary et al., 2000; Ross, Stewart, Mugge, & Fultz, 2001) and a fear of success (Henning, Ey, & Shaw, 1998; Clance, 1985b). People who experience increased levels of impostorism may also feel more depression (Bernard

et al., 2002; McGregor et al. 2008) and anxiety (Clance, 198b5; Clance & O'Toole, 1988; Kets de Vries, 2005).

Research on IP and self-esteem has shown mixed results. For example, Chrisman et al. (1995) and Sonnak and Towell (2001) found strong relationships between impostorism and low self-esteem. Other studies have found moderate correlations between IP and low self-esteem (Kolligan & Sternberg, 1991; Ross & Krukowski, 2003; Topping & Kimmel, 1985). Strangely, some research found no significant links (Harvey, 1981; Topping, 1983). The Schubert and Bowker (2019) research analyzed both the level and stability of self-esteem and how they are related to impostorism. They found "people with low self-esteem are especially vulnerable to impostor feelings, and that people with unstable high self-esteem are more vulnerable to such feelings than are those with stable high self-esteem" (Schubert & Bowker, 2019, p. 749).

Personality characteristics. Impostorism has been linked to differences in personality characteristics. Impostors tend to be introverts (Crouch, Powell, Grant, Posner-Cahill, & Rose, 1991). Feelings of impostorism were associated with some adverse personality traits. Impostor Phenomenon was positively correlated with neuroticism, perfectionism, and introversion (Chae et al., 1995; Ross et al., 2001; Ross & Krukowski, 2003). Pannhausen, Klug, and Rohrmann (2020) looked more closely at the link between impostorism and perfectionism on many dimensions. They found "Doubts about Actions, Concern over Mistakes and Socially prescribed Perfectionism appeared to be efficient predictors of the Impostor Phenomenon…[and] Perfectionistic Strivings, Perfectionistic Concerns as a maladaptive perfectionism factor strongly contributed to the prediction of the Impostor Phenomenon" (Pannhausen et al., 2020, para.1).

By contrast, IP was inversely associated with extraversion, conscientiousness, and agreeableness (Bernard, Dollinger, & Ramaniah, 2002; Chae et al., 1995; Ross et al., 2001). Ross

and Krukowski (2003) concluded that IP can result in maladaptive personality styles that emphasize feelings of inferiority, fear, and self-deprecation. They also found low self-esteem, dependency, and attachment were predictive of impostorism. Clance and O'Toole (1988) showed that people high in impostorism experienced higher levels of anxiety, fear of failure, doubt, introversion, and sensitivity to appraisal. Interestingly, higher levels of IP were positively correlated with Type A personality traits in men but not in women (Hayes & Davis, 1993). It could be suggested that these differences in personality traits and their behavioral manifestations may affect achievement in higher education.

Behavioral Outcomes

Some of the behavioral manifestations of IP were discovered early on. Clance (1985b) mentioned procrastination and over preparation in her description of the Impostor Cycle. Subsequent research has shown positive correlations between impostorism and perfectionism, avoidance of imperfections, and the need to avoid looking imperfect (Ferrari & Thompson, 2006). Other behaviors related to IP have included self-handicapping (Henning, Ey, & Shaw, 1998). People who score higher in levels of impostorism fear both failure and success and therefore they rarely put themselves into situations where they could flop or garner extraordinary success (Clance, 1985b; Henning, Ey, & Shaw, 1998; Lige, Peteet, & Brown, 2017). In addition to increased anxiety, IP has been linked to anxious attachment styles (Clance, 1985b; Gibson-Beverly & Schwartz, 2008; Kets de Vries, 2005). Interestingly, higher levels of IP were associated with feelings of entitlement (Gibson-Beverly & Schwartz, 2008) and certain aspects of playfulness (Brauer & Proyer, 2017).

Leary, Patton, Orlando, and Funk (2000) found a relationship between IP and negative self-perceptions. They suggested the negative self-image may lead to behaviors that reinforce

their low self-appraisals. Leary et al. (2000) found a correlation between IP interpersonal and self-presentational behaviors designed to minimize the appearance of poor performance. Ross, Stewart, Mugge, and Fultz (2001) found IP to be significantly related to achievement, fear of failure, and self-handicapping.

Those with higher levels of IP had higher levels of self-handicapping behaviors (Henning, Ey, & Shaw, 1998). In addition, they either procrastinated or overprepared for activities (Bernard et al., 2002; Birett, 2007; Clance, 1985b). People high in IP have been shown to demonstrate high levels of achievement orientation and perfectionism (Clance, 1978; Henning et al., 1998). According to Sakulku and Alexander (2011) "impostors often secretly harbour the need to be the very best compared with their peers" (p. 79). However, they also had a hard time internalizing their success and accepting praise from others as valid (Chae et al., 1995; Harvey, 1981). According to Clance (1985b), impostors feel uncertain about their abilities and, as a result, they are less likely to accept extra responsibilities or take on higher demands for fear of exposing that they are a fake.

Ferrari and Thompson (2006) found that IP was related to fear, self-handicapping, and concerns over self-presentation. In the first study they found impostorism to be related to social desirability and an unwillingness to show flaws to others. In another study, which only included 72 women, they exposed participants to a failure where they could save face or give a good excuse, a failure that was humiliating, or a success (Ferrari & Thompson, 2006). Ferrari and Thompson (2006) also found the women who had higher levels of impostor fears declared more handicaps when facing a humiliating failure. They did not show significant differences when they could give a good excuse for the failure or when they succeeded (Ferrari & Thompson,

2006). The findings indicated that those with higher levels of IP are really concerned about how they present themselves and how they are viewed by others (Ferrari & Thompson, 2006).

Impostor Phenomenon in Higher Education

The atmosphere of higher education may lend itself to increased feelings of impostorism (Parkman, 2016). Many college students have high levels of impostorism (Parkman, 2016). Hutchins (2015) asserted that impostorism is alive and thriving on college campuses. Higher education environments tend to lend themselves to frequent evaluations, competitiveness, and isolation (Parkman, 2016). In addition, some more non-traditional students may find themselves feeling like outsiders which could influence feelings of impostorism (Gates et al., 2018).

Undergraduate University Students and Impostorism

Thompson, Davis, and Davidson (1997) found students with high impostor scores tended to externalize their success and internalize their failures. They reported more negative emotions and held higher standards for self-evaluation. In a sample of 436 college students, Cowman and Ferrari (2002), found that IP was significantly correlated with self-handicapping, increased shame, and more guilt. Bernard et al. (2002) found that students higher in IP tended to procrastinate on tasks and felt less disciplined than others as a result. Henning, Ey, and Shaw (1998) found an association between psychological distress, perfectionism, and imposter feelings. In their study, impostorism was the strongest predictor of psychological distress in students. McGregor et al. (2008) found that IP was unrelated to grade point average (GPA). Kumar and Jagacinski (2006) found impostorism was positively correlated with test anxiety and negatively related to confidence in personal intellectual ability. Cozzarelli and Major (1990) discovered that undergraduate students who scored higher on levels of impostorism reported more anxiety before important events where they would be evaluated and expected to have

poorer performance when compared to peers. They also felt worse and were less satisfied with their accomplishments. Thompson, Foreman, and Martin (2000) found students who felt significant levels of impostorism experienced more anxious feelings and negative affect when confronted with situations where they could make mistakes. That in turn caused them to view the evaluative situations as more stressful and aversive (Thompson et al., 2000).

Graduate College Students

Much of the research concerning impostorism and students focuses on graduate students (Parkman, 2016). Studies have been conducted with graduate students in psychology (Bernard, Dollinger & Ramaniah, 2002; Castro, Jones, & Mirasalimi, 2004; Gibson-Beverly, & Schwartz, 2008) and doctoral programs (Gibson-Beverly & Schwartz, 2008). Chakraverty (2019) found students felt the most like impostors when applying to PhD programs, when admitted to PhD programs, and during PhD training. Tigranyan, Byington, Liupakorn, Hicks, Lombardi, Mathis, and Rodolfa (2020) looked at impostorism in psychology doctoral students and stated, "perhaps the most striking finding of the study is that 88% of students in the sample reported at least moderate feelings of the IP" (p. 1).

Levant, Villwock, and Manzardo (2020) found that over half of the medical students they surveyed met the threshold for IP with female students showing higher scores overall. In their study of graduate students studying to become physicians, they found that up to sixty percent of students in the United States, Canada, Pakistan, India, Iran, Malaysia, and Nigeria experienced significant levels of impostorism (Gottlieb et al., 2020). As a matter of fact, impostorism has been extensively studied in graduate students pursuing careers in the medical field. More specifically, physician assistant students (Mattie, Gietzen, Davis & Prata, 2008; Prata & Gietzen, 2007), nurse practitioner students (Huffstutler & Varnell, 2006; Sutliff, 1998), and students in

medical residency (Legassi, Zibrowski, & Goldszmdt, 2008; Oriel, Plane & Mundt, 2004) have all been analyzed in terms of their levels of IP (Parkman, 2016).

Another area where impostorism has been extensively studied in graduate students is in science, technology, engineering, and mathematics (STEM). Tao and Gloria (2019) examined IP scores for women in STEM doctoral programs, and they found "impostorism was significantly and negatively associated with persistence attitudes" (p. 157). Their findings indicated that higher feelings of impostorism resulted in more negative views of perseverance in their graduate programs.

Community College Students and Impostorism

Levels of impostorism have not previously been examined in community college student populations specifically. However, there is research on faculty experiences of IP (Parkman, 2016). Gates, Johnson, Manar-Spears, and Gumbs (2018) looked at ways to disrupt IP for community college students of color. They stated that IP is ubiquitous and that it is a threat to authentic learning. Using anecdotal support, they argued that a narrative pedagogy may help students of color bring their personal stories into the community college classroom which may in turn disrupt their feelings of impostorism (Gates et al., 2018). The research of Gates et al. (2018) is based on the supposition that students of color in the community college environment must experience IP. They stated the following:

> The first step in addressing the impostor phenomenon is to acknowledge its ubiquitous existence and increase awareness about it in academic settings. It is safe to assume that students feel like impostors until proven otherwise, which is why we argue that impostorism ought to be viewed as a paradigm for all of higher education, particularly in the community college classroom. (Gates et al., p. 47)

It is important to analyze whether students in the community college really do experience IP in similar levels to other college students. Without that information, the assumption of the pervasive nature of IP could result in research based on flawed beliefs, which cannot withstand scrutiny. In addition, a disproportionate number of underrepresented minority students, like African American and Hispanic students, will start their higher education careers at the community college (Shapiro et al., 2018).

Under-Represented Racial Minority College Students

There is some evidence that under-represented minority students may experience higher levels of impostorism than other students (Graham & McClain, 2019; Le, 2019; Wei, Liu, Ko, Wang, & Du, 2020). There has been research on the experiences of impostorism in African American, Asian American, and Latino/a students (Cokley et al., 2012). Lige, Peteet, and Brown (2017) discussed the theory of othering which suggested underrepresented minority students may feel ostracized and seen as 'the other' in higher education settings. This could increase feelings of IP. They theorized minority students who internalized the feelings of 'the other' may feel like they do not belong in higher education. Conversely, students who had high private regard and self-esteem possessed better coping skills in dealing with the discriminatory and isolating environments of higher education (Lige et al., 2017).

There has also been some comparison research between the different minority groups and surprisingly, Asian American students have the highest levels of IP across several studies (Cokley et al., 2012, Cokley et al., 2017, We et al., 2020). However, the bulk of the research focuses on African American students at primarily white institutions (PWIs) and how their experiences lend themselves to increased feelings of impostorism and the subsequent, mostly negative, mental health consequences (Cokley et al., 2017). A growing body of research has also

examined the experiences of Hispanic students in higher education, and they may also experience increased levels of impostorism in the confrontational environments some college campuses present (Cokley et al., 2017).

Impostorism has been associated with several psychological outcomes in underrepresented minority students. Although there is limited literature on IP in African American college students when compared to other groups, it is important to examine the significant differences observed in the literature. Peteet, Brown, Lige, and Lanaway (2015) indicated feelings of impostorism were positively correlated with psychological distress and inversely associated with self-esteem in African American college students. The Peteet et al. (2015) study was one of the first to focus on IP in African American students specifically. Later, Bernard, Lige, Willis, Sosoo, and Neblett (2017) also studied IP and mental health in African American students. They were interested in the influence of racial discrimination and gender. Bernard et al. (2017) implied primarily white institutions (PWIs) may influence the experiences of IP and can affect feelings of intellectual incompetence and subsequent mental health outcomes. This research was one of the only to hypothesize that PWIs may adversely affect experiences of impostorism for African American students. As hypothesized, Bernard et al. (2017) did find a relationship between IP and depressive symptoms, anxiety, and interpersonal sensitivity. However, IP did not predict increases in negative mental health outcomes overall (Bernard et al., 2017).

McClain, Beasley, Jones, Awosogba, Jackson, and Cokley (2015) evaluated the impact of racial and ethnic identity, impostor feelings, and minority status stress (MSS) on the mental health of African American college students. They defined MSS as the stressors experienced by minority students which could include racism, discrimination, racially insensitive comments, and

questions of belonging on campus. McClain et al. (2015) also acknowledged that minority students at PWIs must cope with a campus environment that can be isolating and judgmental at times. They indicated African American collegians report less favorable campus climates and have higher levels of race related stressors which predicted negative psychological outcomes. The race related stressors included things like racism and discrimination. McClain et al. (2015) found IP and MSS were both associated with lower overall mental health scores. McClain et al. (2015) hypothesized African American collegians' minority status at PWIs place an additional burden on them through feelings of IP and increased MSS. Lige, Peteet, and Brown (2017) investigated the relationships between racial identity, self-esteem, and IP in African American college students at PWIs. Lige et al. (2017) found a significant association between IP and GPA. There were also significant relationships between positive regard, self-esteem, and IP. The data indicated African American college students who felt good about African Americans and their membership in the group had higher self-esteem and lower levels of IP.

Cokley, Smith, Bernard, Hurst, Jackson, Stone, Awosogba, Saucer, Bailey, and Roberts (2017) examined the relationship between imposter feelings, perceived discrimination, and mental health in several underrepresented minority college students. The overall findings indicated African Americans reported significantly higher levels of perceived discrimination than all other groups. Asian American students reported the highest levels of impostorism. Cokley, McClain, Enciso, and Martinez (2012) also reported Asian American students had the highest IP scores. Similar findings were discovered by Wei (2020). Further analysis of the data from Cokley et al. (2017) revealed IP significantly predicted depression in African American students. Impostor feelings also mediated the relationship between perceived discrimination and anxiety as

well as depression in African American students but not for other students. This research showed minority students have different experiences in higher education (Cokley et al., 2017).

Peteet, Montgomery, and Weekes (2015) explored the predictors of IP among talented ethnic underrepresented minority undergraduate students. More specifically, they looked at first-generation status, psychological well-being, and ethnic identity and how they predicted IP scores in high achieving minority students. The criteria for inclusion were undergraduate status, a GPA of 3.0 or above, and self-identification as Black or Hispanic. Peteet et al. (2015) found first generation status was related to IP scores. However, it was not a significant predictor of IP. High racial identity, affirmation and belonging significantly predicted IP scores. Psychological well-being was also related to IP. Environmental mastery was a significant predictor of IP. However, racial identity was not predictive of IP scores. The Peteet et al. (2015) research adds to the literature by examining high achieving African American students and the experiences they had at PWIs.

Bernard, Hoggard, and Neblett (2018) studied the relationship between racial discrimination, racial identity, and IP in African American college students at a PWI. They conducted a longitudinal study in which data were collected from two cohorts of first year students. Bernard et al. (2017) found racial discrimination was positively related to increased levels of IP over time. There was a relationship between racial identity and IP in such a way that higher racial identity and more positive regard was associated with lower levels of IP.

Cokley, McClain, Enciso, and Martinez (2012) examined the impact of MSS and IP on the mental health of underrepresented minority college students. The findings indicated MSS was positively correlated with psychological distress and negatively related to psychological well-being. African American students reported significantly more minority stress. Cokley et al.

(2012) found African American students may find adjustment to at PWIs harder and more stressful compared to other minority students because they usually endure the most negative racial stereotypes. MSS and IP were both related to psychological distress and psychological well-being. IP significantly predicted psychological distress and psychological well-being, even more so than MSS. As predicted, the relationship between IP and distress was positive although the correlation between IP and well-being was negative. This study suggested that impostor feelings may be the reason for the relationship between MSS, race related stress, and poor mental health.

Austin, Clark, Ross, and Taylor (2009) examined impostorism as a mediator between survivor guilt and depression in African American college students. They defined survivor guilt as feelings that one's accomplishments are exhausting the resources of their family or group. They also expanded the definition to include African American students who feel guilty because their good fortunes are not fair when compared to peers who do not get to achieve as much. Austin et al. (2009) did caution that much of the research on African American college student survivor guilt is anecdotal. They found African American students who had stronger feelings of survivor guilt also had greater feelings of impostorism. In addition, greater levels of IP were associated with higher depression scores. The researchers established IP to be associated with depression and survivor guilt to be correlated with increased levels of depression also. Survivor guilt was linked to higher levels of IP. Findings indicated that IP partially mediated the relationship between survivor guilt and depression (Austin et al., 2009).

Joshi and Mangette (2018) looked at impostorism as a part of a mask that minority students are forced to hide behind. These students reported feeling like frauds when they were subjected to certain stereotypes and began to associate their success to external forces. Stone,

Saucer, Bailey, Garba, Hurst, Jackson, Krueger, and Cokley (2018) analyzed impostor feelings in black graduate students. In their qualitative analysis, they found five themes which included "awareness of low racial representation, questioning intelligence, expectations, psychosocial costs, and explaining success externally" (Stone et al., 2018, p. 291).

The research showed significant differences in IP between underrepresented minority students and other students in higher education (Stone et al., 2018). There was also a link between IP and mental health outcomes for underrepresented minority students which included depression, anxiety, and self-esteem. Impostorism was related to racial and ethnic identity, MSS, and experiences of discrimination. The literature has linked IP with numerous psychological, personality, and behavioral outcomes for underrepresented minority college students specifically (Cokley et al., 2012).

First Generation College Students

First generation college students (FGCS) are those whose parents did not earn a college degree. The U.S. Department of Education (USDOE), in the Higher Education Act (1965), defined a FGCS as:

> An individual both of whose parents did not complete a baccalaureate degree; or in the case of any individual who regularly resided with and received support from only one parent, an individual whose only such parent did not complete a baccalaureate degree (Higher Education Act, 1965).

FGCS are at a greater risk of not completing college and lower academic achievement because of low levels of integration and difficulties they experience before and after starting school (Ramos-Sanchez & Nichols, 2007).

Martin (2018) found that 90% of female undergraduate students who were also first-generation experienced impostor feelings, and almost half experienced frequent feelings of IP. Choy (2001) showed FGCS encounter more obstacles, have lower grade point averages, and are more likely to take remedial courses. Terenzini et al. (1996) discovered that FGCS complete fewer credits each semester and also studied less. According to the NCES (2013), most FCGS will start their post-secondary education at a two-year public institution but they will be more likely to graduate if they start at a four-year institution. In addition, college enrollments are expected to increase substantially and there will be more FGCS in both two and four-year post-secondary institutions (NCES, 2013). Martinez, Sher, Krull, and Wood (2009) examined attrition in FGCS and found them to be at very high risk. GPA and low parental education were predictive of dropping out and significantly more common in FGCS. They also discovered FGCS had more psychological distress and more drug use (Martinez et al., 2009). They discussed the role of full-time employment and stereotype threat in the success of FGCS also. The findings suggested that working a lot of hours and the unfamiliarity with higher education could lead to more FGCS dropping out (Martinez et al., 2009).

Le (2019) examined impostorism and mental health in first generation college students of color more closely. She discussed how intersectional identities and experiences influenced feelings of impostorism differently in students of color who are also FGCS. Le (2019) highlighted how IP influenced people of color more both mentally and academically. It is important to noted that FGCS and underrepresented minority students are also more likely to qualify for Pell Grants and are more often classified as low socioeconomic status student populations (Martinez et al., 2009).

Low Socioeconomic Status College Students

Low socioeconomic status is usually measured in the literature by Federal Pell Grant eligibility. The number of students eligible fluctuates based on economic changes (COE, 2018). For example, in 2001, the number was 32 percent, but after the Great Recession, that number increased to 48 percent of students eligible for a Pell Grant (COE, 2018). First generation college students are more likely to report receiving funding from scholarships and grants (Martinez et al., 2009). They are also less likely to receive extra money from their parents. According to the 2018 report from the COE, there was a growth in the number of students in primary and secondary school who are eligible for free or reduced lunch. That was an indicator of the number of potential college students who may qualify for a Pell Grant. Also, in 2015, "82 percent of Hispanic and Pacific Islander children, 79 percent of American Indian/Alaska Native children, and 76 percent of Black children had the potential to be first generation to go to college, compared with 56 percent of children of two or more races, 57 percent of children of some other race, 50 percent of White children, and 34 percent of Asian children" (COE, 2018, p.21).

Income and first-generation status matter because they are indicators of college enrollment and persistence to completion (COE, 2018). There has been in increase in the overall income differences between the top quartile and lower quartile of American average household incomes. The top 10 percent of the population owned 78 percent of the wealth in 2016 (COE, 2018). Similarly, there has been an increase in the gap in college enrollment and completion rates for the top quartile and the bottom one (COE, 2018).

Sonnak and Towell (2001) examined IP in British students. They examined several different variables, which included socioeconomic status (SES) and their relationship to IP scores. In a sample of 117 students, they found several indicators of SES that were either directly

or indirectly correlated with feelings of impostorism. More specifically, it was determined that higher IP scores were positively related to lower self-esteem and poor mental health. Those measures were also related to parental care. The findings indicated that parents who did not have manual jobs showed more care, had a higher SES, and more education. In addition, students who went to private school before college had lower levels of impostorism (Sonnak & Towell, 2001). In their study, self-esteem emerged as the strongest predictor of IP scores.

In a recent study by MacInnis, Nguyen, Buliga, and Boyce (2019) found that students of lower socioeconomic status (SES) reported higher levels of impostorism. In addition, the more friends a student from a lower SES had that were from higher financial statuses, the stronger the feelings of impostorism (MacInnis et al., 2019). That increase in IP scores could result in significant mental health and behavioral consequences that might not be conducive to student success or persistence to completion.

Female College Students

There have been some inconsistent findings on gender and feelings of impostorism. According to Gibson-Beverly and Schwartz (2008), women may be more likely to experience feelings of impostorism because of gender role stereotypes. Early socialization may also play a role in increased levels of IP (Clance et al, 1995). However, other studies have found no significant gender differences in levels of IP (Clance & O'Toole, 1987; Jarrett, 2010; Langford & Clance, 1993).

Oriel, Plane and Mundt (2004) also found increased levels of impostorism in female students. Furthermore, students with more masculine traits tended to have lower levels of impostorism (French, Ullrich-French, & Follman, 2008). More masculine traits were also corelated with more confidence and overall well-being in college students (September,

McCarrey, Baranowsky, Parent, & Schindler, 2001). Cokley et al., (2015) found impostorism directly predicted GPA for women but not for men in college. It is important to note that the absence of overall gender differences in impostorism found in some studies neglects the subtle differences found in the literature.

Kumar and Jagacinski (2006) found female college students had higher IP scores. They also had lower confidence in their overall intelligence and were more likely to avoid the appearance of incompetence. Young African American women who reported higher levels of discrimination were most vulnerable to the negative mental health impacts of IP (Bernard et al., 2017). Chakraverty (2019) discovered gender differences in IP when examining science, technology, engineering, and mathematics (STEM) graduate students. Female students experienced higher levels of IP, especially in their first semester of graduate school. Interestingly, some participants began feeling impostorism as early as high school (Chakraverty, 2019).

Tao and Gloria (2019) found impostorism resulted in more negative views of institutions and lower self-efficacy overall. For women those feelings affected how they saw their persistence also. According to Joshi and Mangette (2018), female students have more roles they have to fulfil, and they can feel overwhelmed which can contribute to feelings of impostorism. Also, women, who endorse traditional gender roles may feel more IP because of norms about success for men and women. Interestingly, Joshi and Mangette (2018) found members of the lesbian, gay, bisexual, transgender, and queer (LGBTQ+) community may experience some of the negative psychological consequences associated with IP. Some individuals may, however, have lower IP scores because of less strict gender roles in the community (Joshi & Mangette, 2018).

Badawy, Gazdag, Bentley, and Brouer (2018) examined gender differences in IP and performance. They found that gender can exacerbate the negative outcomes of impostorism on performance (Badawy et al., 2018). Those differences could have some serious consequences when it comes to persistence to degree completion.

College Students with Disabilities

There is a notable lack of literature on IP in college students with a diagnosed intellectual, behavioral, emotional, and/or learning disabilities. After extensive searching, very little was uncovered about how these students experience and deal with feelings of impostorism. College students who have diagnosed disabilities are not a monolithic group. There are a variety of disabilities that can affect a student's access to and success in post-secondary education. According to Raue and Lewis (2011), most of the college students (31 percent) reporting a disability had a specific learning disability. They were followed in number by those with Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD) which comprised about eighteen percent of the disabled students. Approximately fifteen percent had mental or psychological conditions, and only eleven percent had health related disabilities (Raue & Lewis, 2011). Historically, disabled students were not encouraged to seek higher education; however, that changed after the introduction of legislation and subsequent changes in policy (Madaus, Kowitt, Lalor, 2012).

Federal law significantly influenced access to higher education for students with disabilities (Madaus et al., 2012). Section 504 of The Vocational Rehabilitation Act of 1973 prohibited discrimination against people with disabilities in programs that were given federal financial assistance which included most institutions of higher education. As a result, post-secondary institutions had to begin to find ways to admit and support students with disabilities.

Later, the Americans with Disabilities Act of 1990 (ADA) explicitly forbade discrimination against people with disabilities in all areas of public life which included schools. The ADA required post-secondary institutions to make modifications to their policies, practices and procedures to avoid bias and barriers for students with disabilities (1990).

The result of the federal legislation was an increase in access for disabled students (Madaus et al., 2012). There was a significant upsurge in the numbers of students with disabilities enrolling in higher education. In 1978, about three percent of full-time, first time college freshmen had disabilities (Madaus et al., 2012). According to the National Center for Education Statistics (NCES), in the 2015-2016 academic year, nineteen percent of undergraduates reported having a disability which was an increase from the eleven percent of undergraduates who reported being disabled in the 2011-2012 academic year (Snyder, deBrey, & Dillow, 2016). The data imply that the numbers of college students with disabilities will continue to rise (NCES, 2019). In addition, there are differences in the percentages of undergraduates with disabilities based on demographic characteristics (Snyder et al., 2016). Of note, twenty-one percent of veteran students and sixteen percent of undergraduate students over thirty reported having a diagnosed disability (Snyder et al., 2016). Most disabled students will start their post-secondary career at a community college (NCES, 2019).

Unfortunately, increased access does not necessarily imply more success or similar experiences. Among the students who received special education services in high school, only 59 percent had enrolled in some type of post-secondary education within eight years, and just 31 percent attended within the first two years (NCES, 2019). Out of the students who did enroll, less than half (45 percent) persisted to degree or credential completion at four-year institutions and only 37 percent completed their program at the 2-year institutions (NCES, 2019). The data

showed students with disabilities were not experiencing the same success rates as other students. Part of the reason may be because of the ableism that pervades our institutions (Nario-Redmond & Kemerling, 2019).

The Higher Education Opportunity Act (HEOA) of 2008 attempted to provide some level of equity for students with disabilities. Legislators and organizations lobbied for provisions to be included specifically for students with diagnosed disabilities (Madaus et al., 2012). The result was that the HEOA (2008) included access to federal work-study funds, Pell Grants, and Supplemental Educational Opportunity Grants for students with disabilities (Madaus et al., 2012). Unfortunately, achievement gaps are still present and there are still barriers to the success of students with disabilities in higher education. One obvious obstacle is the need to self-disclose disability status to professors and peers. That can be a daunting task for college students (Sukhai & Mohler, 2017). Kendall (2016) found many students were reluctant to disclose their disability status because of the stigma associated with it.

Shessel and Reiff (1999) unpacked some of the lived experiences of adults with learning disabilities. They looked at both the positive and the negative outcomes of being disabled. There were fourteen adults included in their qualitative research which included ethnographic interviews and some psychometric assessments. Interestingly, the impostor phenomenon was described by several participants. The participants spoke about the frustration and anxiety associated with the fear of being found out as a fraud or as less capable than they appeared (Shessel & Reiff, 1999). One participant talked about “giving off the impression of intelligent, capable and all that stuff, and it was to buffer any kind of interest so people would not notice what she could not do” (Shessel, & Reiff, 1999, p. 310). Another participant who had a physical disability and worked at a university constantly questioned whether he had his job because of

merit or because the institution needed a "success story" (Shessel & Reiff, 1999, p. 310). One of the participants, who was a college student, said "I got to university with a great, great sense of insecurity…I mean, I never believed a single mark I'd earned…I still feel to this day that they're going to suddenly discover that I'm not intelligent" (Shessel, & Reiff, 1999, p. 310).

According to Sukhai and Mohler (2017), impostorism is a constant challenge for students with disabilities. The presence of IP may be because others express low expectations for the success of students with disabilities (Sukhai & Mohler, 2017). Students may not have the accommodations that they need to be successful. In addition, college does not usually provide access to peers, mentors, or role models with disabilities (Sukhai & Mohler, 2017). Often times, people with disabilities are the only one in their family or peer group that has been diagnosed with a disability (Nario-Redmond & Kemerling, 2019). They may feel isolated and defective. Sukhai and Mohler (2017) cautioned students with a disability in higher education will eventually be exposed to the perception that they do not belong there (Sukhai & Mohler, 2017).

For a disabled student in post-secondary education, impostor syndrome can become most discernable when met with success or failure (Sukhai & Mohler, 2017). The apparent accomplishment can make students feel that they do not deserve it, and the failure will reinforce their internal belief that they do not belong in college (Sukhai & Mohler, 2017). According to Sukhai and Mohler (2017), disabled students show feelings of impostorism externally by becoming less accessible to others, showing less motivation, resisting leadership positions, showing decreased productivity, and exerting less effort in classes. As a result of IP, they may also be less eager to present or publish their work, they oppose attending events, and socialize less with peers (Sukhai & Mohler, 2017).

Faculty

There has some evidence that impostor phenomenon also affects faculty in higher education (Hutchins, 2015; Hutchins & Rainbolt, 2016; Sims & Cassidy, 2018). Parkman (2016) stated that IP has the ability to negatively impact not only the retention of students, but of faculty and staff also. The inability to internalize successes coupled with the competitive environment of higher education lends itself to feelings of impostorism (Parkman, 2016). As early as 1994, researchers began to realize that the experience of impostorism was related to "faculty vitality" or teaching effectiveness (Brems, Baldwin, Davis, & Namyniuk, 1994). There was evidence showing faculty with lower levels of impostorism were more comfortable mentoring and enjoyed being role models. They also showed more comfort with being admired by students (Brems et al., 1994). Sims and Cassidy (2018) found faculty members had moderate or higher levels of impostorism with the strongest feelings generated around research.

Hutchins (2015) also examined impostorism in higher education faculty using the Clance Impostor Phenomenon Scale. She discovered that IP is not uncommon among faculty overall. In her sample of 61 faculty members, she found that the prevalence of IP was moderately high. In addition, there was a significant negative relationship between IP and tenure status. Non-tenure track and non-tenured faculty experienced more feelings of impostorism (Hutchins, 2015). There was also a strong statistically significant correlation between impostorism and emotional exhaustion. Resulting in the use of more adaptive and maladaptive coping strategies to deal with IP feelings (Hutchins, 2015).

In another study, Hutchins and Rainbolt (2016) studied what triggered IP in academic faculty. They posited "that academic faculty begin to question their legitimacy as they experience critical junctures or discontinuities in their own identity development formation

around what it means to be a faculty member" (Hutchins & Rainbolt, 2016, p. 4). As a result, they hypothesized that faculty members will experience impostorism as a critical event which results in distress until they learn to cope and adjust their perception of themselves. In addition, the publish or perish environment in academia which is also competitive can exacerbate feelings of uncertainty in their professional abilities (Hutchins & Rainbolt, 2016). The feelings of impostorism can lead to increased stress and questioning of their efficacy and performance (Hutchins & Rainbolt, 2016).

In their qualitative phenomenological study, Hutchins and Rainbolt (2016) found that there were several critical incidents that lead the increased feelings of IP in academic faculty. The significant incidents included a questioning of the faculty member's expertise by other faculty or students. In addition, working on research, proposals, submitting grants, and receiving negative feedback or rejections also increased feelings of impostorism (Hutchins & Rainbolt, 2016). Interestingly, experiencing career successes and being compared to colleagues also lead to increased feelings of impostorism. Unfortunately, most of the faculty members believed that that their colleagues also felt IP, but they did not discuss it with colleagues because they feared it would make them look weak (Hutchins & Rainbolt, 2016). Finally, the research showed that like students, faculty members viewed their feelings of impostorism as distressing and emotionally unsettling. They admitted that impostorism lead to adverse work outcomes which included avoiding opportunities and procrastination. There were also some mental health consequences which included increased stress and anxiety (Hutchins & Rainbolt, 2016).

Impostorism and Outcomes in Higher Education

Impostorism and GPA

The research on IP and GPA is not as straightforward as one might expect. Although impostorism was first recognized in high achieving individuals (Clance,1985b), there is some research that suggests there is no relationship between IP and grades (Bernard et al., 2002; Blondeau & Awad, 2018; Gibson-Beverly & Schwartz, 2008; Thompson et al., 1998). Conversely, other studies have indicated a positive link between impostorism and GPA in women, but not in men (King & Cooley, 1995; Cokley et al., 2015). Remarkably, Lige, Peteet, and Brown (2016) found a significantly negative correlation between impostorism and GPA in women only. The literature insinuates that the relationship between GPA and impostorism is complicated and may be influenced by gender and other variables.

Blondeau and Awad (2018) analyzed GPA, self-efficacy, interest, future intentions and impostorism in a sample of STEM students. They discovered GPA did not have a significant relationship with future intentions for the men or women; however, impostorism was negatively related to future STEM aspirations for men but not for women (Blondeau & Awad, 2018). The implications were that gender differences exist, and they interact with feelings of impostorism, and future intentions. Women tended to persist despite feelings of fraudulence (Blondeau & Awad, 2018).

Impostorism and Persistence

The research directly linking IP with persistence is limited, however the literature about persistence in higher education is vast. There is some evidence that impostorism may be related to attitudes about persistence in higher education settings. Tao and Gloria (2019) found that impostorism was significantly and negatively related to persistence. In their study of female

graduate students, they discovered IP was related to a "lower sense of self-efficacy, more negative views of their academic context, and more pessimistic outlooks toward obtaining their doctorate" (Tao & Gloria, 2019, p. 151). Previously, Clance and Imes (1978) noted that despite feelings of illegitimacy and internal doubts, people with impostorism often persisted in their aspirations toward success.

Much of the research about impostorism and persistence examined the relationship between the two via other variables like self-efficacy (Walker, 2018), learner disengagement (Shedlosky-Shoemaker & Fautch, 2015), or sense of belonging (Graham & McClain, 2019). Because IP is correlated with several psychological and behavioral characteristics which are also related to persistence, the research may not be as straightforward as one would like, but the relationships are there, nonetheless.

Shedlosky-Shoemaker and Fautch (2015) looked at psychological variables that predicted undergraduate student persistence. More specifically, they analyzed differences in student's perceptions of their abilities and performance, motivation, identity, and self-worth. They found students who did not persist in their major "tended to have higher self-doubt and greater desire to avoid failure…additionally, the degree to which competition and academic competence impacted participants' self-worth related to persistence" (Shedlosky-Shoemaker & Fautch, 2015, p. 408). These findings are interesting, because previous research established those higher in impostorism had significantly higher levels of self-doubt and more negative self-concepts (Kets de Vries, 2005; Leary, Patton, Orlando, & Funk, 2000; Thompson, Davis, & Davidson, 1997). In addition, IP is notably related to a fear of failure (Thompson, 1998; Leary et al., 2000; Ross, Stewart, Mugge, & Fultz, 2001).

Walker (2018) looked at IP, academic self-efficacy, and persistence in STEM. She found students with higher levels of impostorism had significantly lower levels of academic self-efficacy, and academic self-efficacy was predictive of persistence in STEM (Walker, 2018). Other studies have also uncovered significant relationships between IP and self-efficacy (Tao & Gloria, 2019; Yamini & Mandanizadeh, 2011).

Impostorism Treatment

Because impostorism has been linked with several detrimental psychological and behavioral outcomes, it is imperative to explore ways to alleviate feelings of IP. There have been several studies and recommendations about how to combat feelings of impostorism. Most of the recommendations involve seeking therapy (Clance & O'Toole, 1987; Langford & Clance, 1993; Matthews & Clance, 1985; Topping & Kimmel, 1985). There is some evidence that feelings of IP may get better as time passes (Harvey, 1981). However, most treatment involves targeted intervention to ease feelings of impostorism and the detrimental outcomes associated with it.

Harvey (1981) discovered feelings of impostorism decreased with age and more years in school. That is a contradictory, because several studies have indicated that IP increases in higher education (Parkman, 2016). Chae, Piedmont, Estadt, and Wicks (1995) also found that impostorism decreased with age. According to Bravata et al. (2019), only two studies of the six they reviewed found feelings of impostorism decreased with age; three studies did not find any age-related differences. In addition, Brauer and Proyer (2017) found that age was related to impostor feelings among professionals but not in undergraduate students. The working professionals were significantly older than the undergraduate students which infers an association between age and feelings of IP (Bravata et al., 2019). It is important to note that "community college students tend to be older than undergraduates overall" (Ma & Baum, 2016,

p. 8). Although there may be a reduction in IP with age, it is unrealistic and perilous to suggest delaying treatment with the expectation that feelings of impostorism may dissipate as one ages.

One of the first to tackle the issue of therapeutic treatment was Pauline Clance who was the first to discover and coin the term impostor phenomenon (Clance, 1978). Clance and Imes (1978) suggested a multi-modal therapeutic approach to treat impostorism. They suggested making clients aware of their feelings of impostorism and working to consciously change their behaviors (Clance & Imes, 1978). Other interventions included group therapy, role-play, keeping a record of positive feedback, and eliminating approval-getting behaviors (Clance & Imes, 1978). Clance and Imes (1978) believed the combination of several Gestalt and cognitive behavioral therapeutic techniques were needed to assuage feelings of impostorism.

Clance and Matthews (1985) conducted a qualitative study based on their experiences with caring for individuals with impostorism. Their treatment recommendations included validating patient's feelings, directly addressing fears of failure, and utilizing group therapy so victims realize they are not alone (Clance & Matthews, 1985). Many people with feelings of impostorism suffer in silence. Group counseling may offer some sense of relief from their silence and isolation (Clance & Matthews, 1985). More recently, there have been several articles, workshops, and websites dedicated to tips on how to deal with and treat what is referred to as impostor syndrome in the lay literature (Bravata et al., 2019).

Coping skills and social supports have been found to be vital when combating feelings of impostorism (Clance, 1985b; Flora, 2016; Hutchins, 2015). Hutchins (2015) found more frequent impostor thoughts were associated with increased use of both adaptive and maladaptive coping strategies. The positive coping skills included use of humor, positive reinforcement, and getting emotional support from others (Hutchins, 2015). The role of mentors and other social supports

have shown promise in alleviating IP (Hutchins, 2015; Vergauwe, Wille, Feys, De Fruyt, & Anseel, 2015). It is important to note that impostorism is associated with social withdrawal and introversion, so the necessity for social connections may pose a challenge for many (Ross et al., 2001). Flora (2016) listed active coping skills as "seeking emotional support, employing humor, exercising, engaging in spiritual practice, and confessing impostorism to one's mentors" (p. 84).

Zanchetta, Junker, Wolf, and Traut-Mattausch (2020) found coaching significantly lowered IP scores. It also "improved self-enhancing attributions and self-efficacy and reduced the tendency to cover up errors as well as the fear of negative evaluation" (p. 1). Vergauwe et al. (2015) also implied that coaching programs focused on increasing self-efficacy and eliminating perfectionistic concerns could reduce IP. Zanchetta et al. (2020) defined coaching as "a goal-focused helping relationship where a coach and client engage in a collaborative effort to set personal goals and develop, monitor, evaluate, and modify goal appropriate activities" (p.3).

Mentoring, like coaching, has been found to assist those suffering from impostorism (Sanford, Ross, Blake, & Cambiano, 2015). In a qualitative study of 29 women leaders, Sanford et al. (2015) found that most of the women did not undergo feelings of impostorism. They attributed their resilience to their relationships with mentors, romantic partners, and other women in leadership positions (Sanford et al., 2015). In addition, when impostorism was experienced, social supports still buffered its negative effects (Vergauwe et al., 2015). Graham and McClain (2016) also discovered an inverse relationship between mentorship and impostorism. In addition, students with mentors adjusted better and felt more belongingness with their schools (Graham & McClain, 2016).

Other research on lessening impostorism has focused on having or fostering a growth mindset (Zanchetta et al., 2020). Claro, Paunesku, and Dweck (2016) found growth mindset to

be associated with the belief that abilities can be developed as opposed to the fixed mindset which was indicative of the belief that abilities were immutable. According to Zanchetta et al. (2020), the growth mindset can be used to "improve impostors' basic assumptions about the belief that their successful performance is due to some kind of luck (external-unstable-specific success attribution)" (p. 3). The idea behind the growth mindset is that people suffering from IP will learn to see the growth in their abilities which can also increase their self-efficacy (Zanchetta et al., 2020).

Brauer and Proyer (2017) discovered that playfulness, like a growth mindset, may also serve to promote resilience from the negative thought patterns and behaviors associated with impostorism. Because playfulness has been associated with positive coping and healthy psychological functioning, the researchers wanted to examine it as buffer to impostor experiences (Brauer & Proyer, 2017). Playfulness was assessed with a 28-question inventory that divided it into four categories as follow:

> Other-directed ("I use my playfulness to cheer others up"), Lighthearted ("I am an unconcerned person"), Intellectual (e.g., "I always have an idea about what to do"), and Whimsical playfulness (e.g., "I have the reputation to be a little odd or flamboyant") (Brauer & Proyer, 2017, p. 59)

In their study of students and working professionals, Brauer and Proyer (2017) found that students had higher overall levels of IP, and for them impostorism was significantly negatively related to lighthearted playfulness. For the working professionals, other types of playfulness were negatively correlated with IP (Brauer & Proyer, 2017). Interestingly, lighthearted playfulness was found to be the best predictor of IP scores for the students and working

professionals. The ability to play lightheartedly may help lighten feelings of impostorism (Brauer & Proyer, 2017).

Wong (2018) wrote an article on impostor phenomenon for the New York Times, and he interviewed Dr. Kevin Cokely, a leading researcher in the area. The article listed several suggestions to combat IP. The recommendations included joining an affinity group which should include people who are similar to each other in education, profession, or status. Dr. Cokely also recommended getting with the affinity group to talk about vulnerabilities and insecurities (Wong, 2018). It was suggested that people recruit a mentor, and the last suggestion was to document accomplishments and progress (Wong, 2018). In a more recent interview, Kevin Cokley, spoke about what professors can do to help students deal with IP. He specified:

> Professors can address impostorism among students of color by 1) including books and articles written by scholars of color, 2) discussing the contributions of scholars of color in your field, and 3) having meetings with students of color and affirming your belief in their potential and deservedness to be there. (Lederman, 2020, para. 11)

Gates et al. (2018) looked at ways to disrupt IP in community college students specifically. He claimed that a narrative pedagogical approach where students of color can integrate themselves into the learning environment could help alleviate the feelings of inadequacy and fraudulence associated with IP (Gates et al., 2018).

Current Research

The current research seeks to fill several gaps in the literature. Given the pervasiveness of impostorism and its omnipresence in higher education, it is important to understand its impact on as many student populations as possible (Parkman, 2016). Unfortunately, community college communities have been excluded from the literature on impostor phenomenon in higher

education, and in this study, I seek to fill this gap and understand the presence of IP and its impact on community college students as well as more traditional 4-year public university students (Gates et al., 2018). In addition, the current study analyzes the levels of IP in certain at-risk student populations which are important to understand in community college students also. Underrepresented racial and ethnic minority groups, as well as Pell-Grant eligible students, disabled students, and first-generation community college students will be further scrutinized for their levels of impostorism. In light of the documented consequences of higher IP scores on mental health and the psychological and behavioral consequences of feeling like a fraud, there are benefits to identifying students who are at risk and targeting them for interventions.

Since persistence to completion is the goal for all institutions of higher education, it is vital to understand how impostorism scores affect not only intent to persist but also grade point averages because they are both related to actual completion rates (Shapiro et al., 2018). The current research seeks to not only fill the gaps in the literature on community college students and their experience of IP, but it will also compare them to public four-year university students in their first or second year of study. The information gained will advance the knowledge we have on community college students, how they compare to other students in their experiences of impostorism, and how it affects their intent to persist to completion.

CHAPTER III

METHODOLOGY

Since its identification in 1978, the impostor phenomenon (IP) has been studied in several different populations (Clance & Imes, 1978). Although originally observed in women, it has also been found in men (Clance & O'Toole, 1987). Impostorism has been widely studied in higher education (Parkman, 2016). The culture of higher education lends itself to higher levels of IP (Davis, 2010; McElwee & Yurak, 2010; Topping & Kimmel, 1985). Both students and faculty have been shown to have increased feelings of impostorism (Brems, Baldwin, Davis, & Namyniuk, 1994; Parkman, 2016). Impostor phenomenon has been shown to affect mental health (Henning, Ey, & Shaw, 1998; Sonnak & Towell, 2001); self-esteem (Lige, Peteet, & Brown, 2017; Sherman, 1988), depressive thoughts (Chrisman, Piper, Clance, Holland, & Glickauf-Hughes, 1995), psychological distress (Henning et al., 1998), anxiety (Clance, 1985b), and self-doubt (Kets de Vries, 2005). Impostorism also affects college success (Lige, Peteet, & Brown, 2017). There has been very little, if any, empirical studies on the presence of impostorism in community college students. They have been largely ignored in the literature and that is problematic. Measures of IP in community college students may help to explain some of the lower levels of completion reported. In addition, comparisons between community college and four-year public university students in their first or second year of study may help explain some of the differences in success and completion.

Purpose Statement

The purpose of this study was to examine impostorism among community college students and to compare them to similar students who are in their first or second at public four-year universities. Using the Clance Impostor Phenomenon Scale (CIPS), the study compared

impostorism scores for community college students to the scores of first- and second-year public university students. Additionally, the study explored whether variables such as under-represented race/ethnicity status, first generation status, Pell Grant eligibility, disability status, and/or gender affected the CIPS scores of college students. The goal was to address the gap in the literature when it comes to IP and community college students and to compare community college students to public four-year university students in their first or second year of study. Finally, the study sought to examine the relationships between impostorism, self-reported grade point average (GPA), and intent to persist and to determine if IP and GPA were predictive of intent to persist.

Research Questions

The research was guided by the following questions:

1. What is the prevalence of impostorism at three Virginia community colleges?
2. Are there statistically significant differences in the Clance Impostor Scale (CIPS) scores for community college students based on demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status (URM); (b) Federal Pell Grant eligibility (PGE); (c) first generation status (FGS); (d) disability status, or (e) gender?
3. Are main effect demographic differences in CIPS scores qualified by interactions between different demographic characteristics: Specifically, (a) URM; (b) PGE; (c) FGS; (d) disability status, or (e) gender?
4. Is there a statistically significant difference between CIPS scores between community college students and similar students in their first or second year at a public four-year university?

5. Are there statistically significant differences in the CIPS scores between community college students and students in the first or second year at a public four-year university based on demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status;(b) Federal Pell Grant eligibility; (c) first generation status; (d) disability status, or (e) gender?
6. Are main effect demographic differences in CIPS scores qualified by interactions between different demographic characteristics in community college students and students in the first or second year of study at a four-year public university based on the type of institution and demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) disability status, or (e) gender?
7. Are there significant correlations between impostorism scores, self-reported GPA, and intent to persist at the current institution of higher education?
8. Does level of impostorism and/or self-reported GPA significantly predict intent to persist?

Research Design

This was a non-experimental quantitative research study. The Clance Impostor Phenomenon Scale (CIPS) was utilized to analyze group differences in two independent groups of college students. The two groups were community college students and public university students. The survey design of the proposed research was similar to previous research on impostorism in higher education (Parkman, 2016). This study extended prior research by including community college students. The design allowed for comparisons of specific student populations in the community college and the public four-year university. Because impostorism

has been associated with personality, psychological, and behavioral outcomes that affect student success, this study was a step in determining whether it affects community college students and public four-year university students similarly. In addition, the outcome data may help us to better understand how intent to persist and self-reported grade point average (GPA) in both community college and four-year public university students are related to each other and to impostorism. Finally, it is valuable to discover whether or not levels of impostorism and self-reported GPA can help to predict intent to persist.

This research design employed a non-experimental quantitative analysis of group differences utilizing a factorial analysis of variance (ANOVA). As with any statistical analysis, there were some assumptions that were associated with the ANOVA. The first assumption was the independence of errors (Gamst, Meyers, & Guarino, 2008). The next assumption of ANOVA was of normally distributed residual errors (Field, 2013). According to Gamst et al. (2008), to avoid this error, small sample sizes should be avoided, and outliers should be eliminated. As such, both univariate and multivariate outliers were identified using statistical software, and they were eliminated from the analysis. It was important to note that ANOVA is robust to non-normal distributions when sample sizes are large and equal (Field, 2013). To statistically check for normality, each variable's skewness and kurtosis were analyzed. According to Gamst et al. (2008) "Skewness and kurtosis values that are zero or close to zero indicate a normally distributed variable, and values greater than or less than +1.0 and -1.0 are considered indicative of a nonnormally distributed variable" (p. 56). There were no violations of the assumptions present in the data.

The final assumption of ANOVA was of homogeneity of variance (Gamst et al., 2008). This violation involves groups with unequal variances in the distribution of residual errors.

Homogeneity of variances was checked with the Levene's Test (Field, 2013). To correct for any violation of this error, a more stringent alpha level was utilized in the statistical analysis (Gamst et al., 2008). Exploratory post hoc analysis of all possible pairwise comparisons was also completed. This method was more inclusive in that there were more comparisons made (Gamst et al., 2008). Analysis of data was completed using the Statistical Package for the Social Sciences (SPSS) version 27 and R Program with the Miceadds package. Descriptive statistics were obtained to summarize and describe the data.

Of note, the final sample included a substantial portion of missing data. According to Dowd, Hughes, Tilling, and Heron (2019) for large data sets, five percent missing data is the upper limit. When there is more than ten percent missing, there may be some bias in the analyses (Dowd et al., 2019). The current data set contained more than ten percent missing data, so a multiple imputation was done on the data prior to the analyses (Rubin, 1976). SPSS v. 27 was utilized to estimate five imputations of the data. According to Schafer (1999) "unless the rates of missing information are unusually high, there tends to be little or no benefit to using more than five to ten imputations" (p. 7). R Program with the Miceadds package was also used to impute the data and determine pooled statistics for the ANOVA.

An independent samples *t*-test was done via SPSS v. 27 and utilized to compare the community college students and the four-year public university students on their levels of impostorism. *t*-tests are appropriate when trying to establish whether two groups are different from each other. As with other tests, there are assumptions associated with *t*-tests. The first assumption is that the data is randomly sampled from the population. The next assumption is that the scale of the dependent variable is on a continuous or ordinal scale. Next, *t*-tests assume a normal distribution of the data. Finally, like ANOVA, a *t*-test assumes homogeneity of variance.

Because of the relatively large samples size, the assumption of normality should not pose an issue for the current study. In addition, homogeneity of variance was checked via Levene's test for Equality of Variances, and the assumption was met.

A linear regression was completed using SPSS v. 27. A multiple regression analysis was used to answer the research question about predicting the intent to persist by levels of impostorism and self-reported. Prior to and as a part of the regression, a Pearson's bivariate correlational analysis was done to examine the relationships between IP, GPA, and intent to persist. For the Pearson *r* correlation, there are some assumptions that must be considered. According to Field (2013), the most important are the assumptions are of normality and linearity. The variables should be normally distributed and have a linear relationship. In addition, homoscedasticity assumes equal distribution of the data about the regression line (Field, 2013). The assumptions of normality and linearity were checked in the current study with graphs and scatterplots. The relatively large samples size should mean that the assumption of normality will be a concern. After the correlational analysis, the averages and ranges were reviewed, and descriptive statistics were reported to describe the data.

In order to prepare the data for the multiple regression, the specific research question was outlined. The question was whether there was a significant correlation between the variance in the students' impostor scores, the variance in self-reported GPA, and the variance in each student's intent to persist which would allow for predictions about the intent to persist in the students at the community college and in the students in their first or second year of study at the public four-year university. The next step in the regression analysis was to determine types of variables.

Level of IP was an interval variable that was measured using the CIPS score. Again, those scores could range from 20-100. Self-reported GPA was a ranked or ordinal variable that was coded into a useful format for the regression analysis. The rankings were based on the grading scale for the public four-year university included in the study. More specifically, reported GPAs of F or numbers less than 0.69 were reported as a 0. There was only one. Reported GPAs of D, or numbers between 0.70 and 1.69, were given a number of 1. Reported GPAs of C, or numbers between 1.70 and 2.69, were given a number of 2. Reported GPAs of B, or numbers between 2.70 and 3.69, were given a number of 3. Reported GPAs of A, or numbers 3.70 and above, were given a number of 4.

Intent to persist was also coded as an ordinal or ranged variable. The questions utilized asked "How likely is it that you will return to your current institution in the Fall of 2020?" and "I am likely to continue in my current institution of higher education through graduation or completion of my program of study." The responses were given on a Likert scale ranging from 1 ("definitely not going to return/remain") to 5 ("definitely going to return/remain"). The middle response was 3 ("I am not sure"). The scores from the two questions were averaged for a total intent to persist score that ranged from 1 to 5.

As with ANOVA and *t*-tests, there were some assumptions in multiple regression analysis that were considered. The first assumption was that the relationship between the variables was linear (Keith, 2015). Scatterplots were created using SPSS v. 27 and they were analyzed to make sure that the relationships were linear and not curvilinear. According to Keith (2015), most regression models are robust enough to deal with minor variations in linearity. In addition, outliers can also interfere with the interpretation of a regression analysis (Keith, 2015).

The data were plotted to find any outliers that would affect the regression analysis, none were identified for further examination or removal.

When running a multiple regression analysis, the independent variables should not be excessively correlated (Keith, 2015). To check, correlations were analyzed between each of the predictor variables to look for multicollinearity. Pearson's *r* is the most commonly used method to test for significant relationships in normally distributed data with variables on an interval or ordinal scale (Keith, 2015). For this research, the two independent variables, which included self-reported GPA and IP, the correlation was 0.01, which was not statistically significant using a two-tailed model and N=723. Therefore, multicollinearity did not pose an issue for the variables in this study.

Using a multiple regression, it was also important to select the best procedure for developing the model to explain the variance in the dependent variable (Keith, 2015). The methods in SPSS v. 27 included forward, backward, stepwise, and enter. This research utilized the enter method because there were only two predictor variables, and it was an efficient method to analyze the data (Keith, 2015). The model produced a regression coefficient which denoted the average amount of change in persistence scores associated with a one unit increase in the predictor variables while other independent variables were held constant. The coefficient gave the slope of the regression line (Keith, 2015). Next, the significance of each of the individual variables was tested against the null hypothesis, which was a regression coefficient of zero. The total model was tested utilizing an *F*-test for significance of the regression in the whole model. In addition, *t*-tests were run to analyze the significance of each of the independent variables separately using the regression coefficients (Keith, 2015). The 0.05 standard was used for significance of the *F*-test and the *t*-tests. Pooled results were also utilized when available.

The goodness of fit was assessed with the multiple correlation or *R* square (R^2). This number was an indication of how well the regression line fit the data points and explained the percent of the variance in the dependent variable, which was explained by the independent variables (Keith, 2015). To look at the importance of both predictor variables, the standardized beta coefficients were inspected. They allowed for an estimate of the amount that self-reported GPA and CIPS scores predicted the variance in intent to persist while holding the other variable constant (Keith, 2015).

Setting/Context

This study was done using an online survey via Qualtrics. As such, the specific settings when and where the survey was completed was not determined. The survey could be completed with any device that allows internet service. There were not any face-to-face administrations of the survey. There were four different institutions of higher education sampled for participants. Three of the institutions were community colleges in Virginia. The third was a public four-year institution which is also located in Virginia. The independent variable was the type of higher education institution each student attended, and the dependent variable was the CIPS score. To ensure that the necessary data were obtained, the survey was open for about eleven weeks. The first participant was on March 10, 2020 and the last was on May 21, 2020. The survey was closed shortly after the semester ended after it was determined that the targeted number of participants had responded based on the power analysis.

Three different community colleges were utilized for the study. They were Thomas Nelson Community College (TNCC), John Tyler Community College (JTCC), and Reynolds Community College (RCC). These three institutions were picked for several reasons. They were all similar to the public four-year institution participating in the study which was Old Dominion

University (ODU). All three community colleges were relatively urban and close in geography to ODU. They had similar percentages of minority students also. In addition, they were some of the largest institutions in the Virginia Community College System (VCCS) which allowed for ample sample sizes. Finally, the VCCS system office was contacted for information about data collection at multiple institutions. The head of institutional research, data warehousing and assessment activities at the VCCS was consulted. Her office provided critical data necessary for national and state reporting. She also led the system-wide effort to provide current financial, student, financial aid, and human resources data to leaders at all levels of the different institutions. She suggested TNCC, JTCC, and RCC as good institutions to utilize in the proposed research.

The first community college was Thomas Nelson Community College (TNCC). It was the fifth largest community college in the state, and it had two different campuses, one campus in Hampton and the other in Williamsburg. Thomas Nelson served approximately 11,588 students. Of those students, approximately 59 percent were female, and about 50 percent were racial minorities. About 31 percent of their population identified as Black or African American, and around ten percent were Hispanic. In addition, 63 percent of their students were a part of underserved populations. Those include racial minorities, first generation students, and low-income students (TNCC, 2019).

The second community college was John Tyler Community College (JTCC). It was one of the largest in VCCS. They had more than 14,000 students in the 2017-18 academic year. They also had two campuses. One was in Midlothian and the other was in Chester. Approximately 63 percent of their student body was female, and 25 percent identified as Black. They identified

7,982 students as a part of an underrepresented population which included students who were low income, first generation, or part of a racial or ethnic minority.

The final community college was Reynolds Community College (RCC). It was the third largest in the VCCS. It had three campuses and more than 13,000 students attended in the 2018-2019 academic year. They served Richmond, Henrico, Hanover, Goochland, Powhatan, and Louisa counties in Virginia. Their student population was 31 percent Black or African American and seven percent Hispanic/Latino.

Old Dominion University (ODU) which was also located in Virginia was one of the largest universities in the state. It ranked number six in overall size. It had a total undergraduate enrollment of 19,372. Of those undergraduate students, approximately 55 percent were female. Forty-seven percent of the students identified as White, 28.2 percent as Black or African American, and eight percent as Hispanic or Latino. Old Dominion University and the VCCS had a guaranteed admissions agreement which allowed for transfer from all twenty-three colleges in the VCCS to ODU. The agreement may be why ODU was one of the largest feeder institutions for the VCCS. This meant that many community college students in Virginia transferred to ODU after completion of their programs.

Measures

There were three at least three different scales used to measure IP in the literature (Bravata et al., 2019). They included the CIPS (Clance, 1985), the Harvey Impostor Phenomenon Scale (HIPS) (Harvey, 1981), and the Perceived Fraudulence Scale (PFS) (Kolligian & Sternberg, 1991). Each instrument was a self-report measure that contained a Likert-type scale with varying numbers of items. The PFS had fifty-one items, the HIPS had fourteen, and the CIPS had twenty. For each scale, scores are supposed to be added together for a total score and

higher totals indicate more feelings of impostorism. The Clance scale was selected because of its widespread usage, its psychometric properties, and because it had the best reliability and internal consistency findings of the instruments.

In past research, the CIPS has shown internal reliability with Cronbach's alpha scores of $\alpha = 0.91$, $\alpha = 0.92$ and $\alpha = 0.96$ (Chae, Piedmont, Estadt, & Wicks, 1995; Chrisman et al., 1995; Holmes et al., 1993). The Cronbach's alpha for the current study was $\alpha = 0.92$. The CIPS has a Likert scale ranging from 1 ("not at all true") to 5 ("very true") (Clance, 1985). The numbers were added together, and scores ranged from 20-100 (Clance, 1985). On the CIPS, scores of 41-60 indicated moderate levels of impostorism, 61-80 showed frequent IP feelings, and 81 and above indicated often and intense feelings of impostorism (Clance, 1985). Scores on the CIPS were found to be highly correlated with HIPS and PFS scores (Chrisman et al., 1995) which indicated construct convergent validity. It was also differentiated from measures of depression, self-esteem, and anxiety which indicated construct discriminant validity (Holmes, Kertay, Adamson, Holland, & Clance, 1993).

There has been some research to indicate that the Clance scale has subscales which point to different types and levels of impostorism (French et al., 2008; Ibrahim, Münscher, & Herzberg, 2020; Simon & Choi, 2018). The three subscales identified by Chrisman et al. (1995) included *Fake*, *Discount*, and *Luck*. French et al. (2008) conducted an analysis of the items, internal consistency reliability, and factor structure of the CIPS using a confirmatory factor analysis. They found the best fitting model included two different factors which they described as *Fake*/*Discount* and *Luck* (French et al., 2008). In a confirmatory factor analysis, Simon and Choi (2018), found the best model fit for the CIPS included only one single factor. Ibrahim et al. (2020) points to the high internal consistency of the Clance across multiple studies, but also

notes some caveats when using the CIPS. One such caveat is the use of total scores that do not differentiate the different aspects and dimensions of impostorism (Ibrahim et al. 2020). French et al. (2008) noted the usefulness of the total CIPS score but also noticed the presence of subscales present in the scale which needed more study and revision.

The demographic variables selected for analysis in the present study were based on previous research, which included but was not limited to statistics on groups that were at risk of dropping out prior to completion. As such, under-represented racial/ethnic minority status, gender, Pell Grant eligibility, disability, and first-generation status were surveyed and analyzed in relation to feelings of IP in community college and four-year public university students who are in their first or second year of study.

Both level of impostorism and self-reported GPA were analyzed in terms of whether or not they were predictive of intent to persist at the participant's current post-secondary institution. Self-reported GPA was obtained by asking "What is your current grade point average on a 4-point scale? Keep in mind that in general an A = 4.0, B= 3.0, C= 2.0, and a D= 1.0." Students were allowed to enter their response using a single line of text entry. Intent to persist was measured utilizing the average of two different questions. The first question was "How likely is it that you will return to your current institution in the Fall of 2020." Participants were asked to respond using a Likert scale ranging from 1 ("definitely not going to return") to 5 ("definitely going to stay at my current institution"). The middle score of 3 was "I am not sure". The second question read: "I am likely to remain at my current institution of higher education through graduation or completion of my program of study." The responses ranged from 1 ("Definitely not going to remain in my current institution through graduation") to 5 ("Definitely going to remain in my current institution through graduation"). Again, the middle score of 3 was "I am

not sure." The scores for the two questions were averaged to get a total persistence average that ranged from one to five with higher scores indicating greater intent to persist at the participant's current post-secondary institution.

Procedure

Prior to data collection, approval for the study was obtained from the College of Education Human Subjects Review Committee at Old Dominion University (ODU). In addition, permission was obtained from the IRB's of each of the 3 community colleges in the VCCS selected for participation. Since community college data were more difficult to acquire, the review process began as soon as ODU granted approval. Each community college had their own review process and approval took varying amounts of time at each institution.

An anonymous link was generated with Qualtrics and distributed to all potential participants via email. Qualtrics was an online survey tool which allowed participants to complete surveys online via a link. The email included information about the study, a short introductory message from the researcher, and an invitation to participate in the survey. If they clicked on the Qualtrics link, the first page displayed was an informed consent form followed by the 20 items of the CIPS, ten demographic questions, a question about current grade point average, and two questions about intent to persist at the participant's current institution. There was no anticipation of potential risk for harm for participants, and the entire survey took less than 10 minutes of their time. The data collection took place over approximately ten weeks for all four institutions surveyed.

The data collection plan after IRB approval at the four institutions started in March of 2020 and it ended it May of the same year. Data collection started by sending out emails to all available students at each institution. Emails were sent out by Shanda Jenkins at ODU and

TNCC. At RCC and JTCC, emails were sent by a designated person at the college. Access to student email addresses was limited by the institution. Therefore, availability was limited by institutional policies and protocols. A reminder email was sent out to students again a few weeks later in the same manner. The survey remained open for approximately twelve weeks in order to get as many participants as possible. There was a raffle of twenty-five-dollar gift certificates as incentive for participation. Two certificates were awarded randomly to students at each institution for a total of eight awards. In addition, the inclusion of the remainder email and the extra time may have helped to gather more participants.

For this study, the community college students were recruited differently from the first- and second-year students at ODU. For all the community college students, recruitment emails were sent to all the students enrolled either full or part time. Participation was completely voluntary, and incentive was given for participation. Interested participants were offered a chance to win a gift card if they completed the survey. The only stipulation was that students must be over 18 years of age, and dual enrollment students were not included in the analysis. For the first- and second-year public university students, participants were recruited from undergraduate student populations registered either full or part time as freshmen or sophomores. Students were primarily recruited from psychology classes, and emails were sent to faculty members that taught introduction to psychology and developmental psychology classes. The psychology department had a research participation process in place that allowed for recruitment of students. Again, participation was completely voluntary, and the same incentive was given for participation. The only requirement was participants had to be 18 or older. All students who volunteered and completed the survey were included in the analysis.

Power analyses were conducted to determine the optimal number of responses to ensure adequate power in all the planned comparisons. Power was analyzed with G*Power version 3.1.9.4. For the community college student group differences, according to the a priori power analysis, for an analysis of variance (ANOVA) design with five groups analyzed on a continuous variable which included fixed effects, special main effects, and interactions, the sample should have at least 196 participants to ensure enough power for an alpha of .05, an effect size of 0.25, and a power of 0.80. As such, each group should have at least 40 participants. For the comparisons between community college students and public four-year university students, according to the a priori power analysis, for an ANOVA design with ten groups analyzed on a single continuous variable which included fixed effects, special main effects, and interactions, the sample should have at least 259 participants to ensure enough power for an alpha of 0.05, an effect size of 0.25, and a power of 0.80. Therefore, each group should have at least 26 participants. For the regression analysis, for a linear multiple regression with a fixed model and either R^2 increase or R^2 deviation from zero with two predictors, an effect size of 0.25, and a power of 0.80, there should be at least 68 participants in the total sample. An effect size of 0.25 was utilized in the power analysis because according to Cohen (1992), it is appropriate for a medium effect in behavioral sciences when using an analysis of variance.

Data Analysis

Data analysis was done on SPSS statistical software version 27 and R Program with the Miceadds package. Different analyses were utilized to examine each research question. The first research question was about the prevalence of impostorism at three Virginia community colleges. As such, student CIPS scores were analyzed and grouped by frequency into the identified levels of IP. Clance (1985) suggested the following groupings and designations: scores

of 41-60 indicate moderate levels of impostorism, 61-80 show frequent IP feelings, and 81 and above indicate frequent feelings of impostorism and they were utilized in the frequency distributions for the research. Descriptive statistics which included means and standard deviations were reported to show the percentage of community college students experiencing impostorism at each level (Clance, 1985).

To look at group differences between the community colleges and the public-four-year university students in their first or second year of study, an independent samples *t*-test was utilized to assess group differences. Descriptive statistics were also reported, and pooled results were utilized when available.

The second and third research questions more closely examined impostorism in community college students. To analyze and compare the CIPS scores of community college students based on selected demographic characteristics, a 2 (URM) X 2 (PGE) X 2 (FGS) X 2 (Disability) X 2 (Gender) factorial ANOVA was utilized. Descriptive statistics were reported. In addition, contrasts were investigated, more specifically, both main effects and interactions were examined.

For the research questions about significant differences between community college and public four year university students in their first or second year of study, another factorial 2 (URM) X 2 (PGE) X 2 (FGS) X 2 (Disability) X 2 (Gender) X 2 (Institution type) ANOVA was utilized to look at the main effects of group differences, to examine significant differences based on demographic characteristics, and to analyze any possible interactions based on institution type and demographic characteristics. An alpha level of 0.05 was utilized to determine statistical significance and both comparisons and interactions were analyzed based on the research

questions. Again, descriptive statistics which included group means and standard deviations were reported.

According to Cohen and Cohen (1983), this type of analysis was recommended when a theoretical or hypothetical causal structure of the data does not apply, and the researcher does not know which variables correlate with the outcome variable. A factorial ANOVA was employed instead of multiple *t*-tests because it was more appropriate for the analysis and did not result in a loss of power. Multiple *t*-tests increase the likelihood of a Type I error (i.e., the rejection of a true null hypothesis) which is often referred to as a false positive finding (Field, 2013).

A correlational analysis was utilized to examine relationships between impostorism scores, intent to persist, and self-reported GPA. Although these variables were not focused on in the IP literature, they were heavily researched in relation to persistence to completion. A correlation is the appropriate analysis to look at relationships between these variables and levels of impostor feelings (Keith, 2015)

A linear regression was used to discover if impostorism scores or self-reported GPA were predictive of intent to persist in the entire college student population surveyed. Regressions are most appropriate for determining not only the relationships between variables, but also if one or more variables can predict or account for the change of an outcome variable.

Limitations

As with any study, decisions were made about the limitations and delimitations of the research. The first limitation was that the study only focused on community college and university students at a small select number of institutions. As such, they may not be representative of the larger community college or public university student populations. Secondly, only volunteer data was utilized, and little incentive was given for participation.

Therefore, people who participated may be different from those who chose not to. Having a limited sample and only one construct and demographic characteristics bound the scope of the study. Also, the use of self-report questionnaires relied on participant's willingness to be honest in their answers. Some participants may be reluctant to disclose some information requested. Another limitation was the use of the online format for administering the questionnaires. As such, no controls could be made on the environment during which the surveys are taken or the amount of distraction present. Finally, this study did analyze qualitative data and as such may lose some of the personalized experiences of students experiencing higher levels of impostorism.

Confidentiality

It is believed that there was minimal potential risk to the participants of this study. However, it is important to note that there is always a small chance that information could be released. To protect the students, other than the consent form, no identifying information was collected. Students could voluntarily give their email for a chance to be included in the give certificate drawing, but their email addresses were not associated with their answers. The data analyzed did not include any information that could connect students with their responses. In an abundance of caution, data was stored in a secure location which was password protected and only accessible to the principal investigator and the co-investigator. In order to protect the institutions of higher education, pseudonyms were used for each institution prior to releasing study information. The participating community colleges will be given reports of the overall findings upon completion.

Conclusion

The proposed study was a non-experimental quantitative analysis of independent group differences in college students. The groups were community college and public university

students. They were compared based on their reported feelings of impostorism as measured by the Clance Impostor Phenomenon Scale. Because feelings of impostorism have been associated with several outcomes that could affect students in higher education, the experience of impostorism has the potential to impact several aspects of student well-being (Parkman, 2016).

CHAPTER IV

RESULTS

The impostor phenomenon (IP) is a psychological construct that has been correlated with several detrimental outcomes in the literature (Bravata et al., 2019, Chae et al., 1995; Fried-Buchalter, 1997; Sonnak & Towell, 2001). In addition, there is a body of evidence which suggests IP flourishes in higher education environments (Parkman, 2016). Unfortunately, the research on community college students has been minimal at best (Parkman, 2016). The purpose of this study was to explore the extent to which IP affects community college students. It also seeks to analyze whether there are significant differences in levels of impostorism based on certain demographic characteristics which included gender, under-represented racial or ethnic minority group membership (URM), Pell grant eligibility (PGE), first generation status (FGS), and disability status. In addition, community college students were compared to four-year public university students who were in their first or second year of study. The goal was to determine if there were significant differences in levels of IP based on institution type. The data were also analyzed to determine if levels of impostorism were related to self-reported grade point average (GPA) and intent to persist. Finally, the research investigated whether IP scores or self-reported GPA predicted intent to persist in community college and public four-year university students.

Organization of Data Analysis

To begin the analysis, demographic data which included gender, URM, PGE, FGS, and disability status are collected and divided by institution type. Next there was an explanation of the data analysis for each research question. The discussion of the data includes inferential statistical analyses and comparisons of the levels of IP based on institution type and demographic characteristics. A summary of the data analysis is given at the conclusion of the chapter.

Measure Data

In previous research, the Clance Impostor Phenomenon Scale (CIPS) has shown high internal consistency reliability for participants from academic settings. For example, Cronbach's alpha scores of $\alpha = 0.91$, $\alpha = 0.92$ and $\alpha = 0.96$ have been reported in the literature (Chae et al., 1995; Chrisman et al., 1995; Holmes et al., 1993). In the current study, an exploratory factor analysis was completed using SPSS v. 27 software, and a Cronbach's alpha score of $\alpha = 0.92$ was obtained and was consistent with previous research. According to French et al. (2008) the Clance scale is useful when utilizing total IP scores. However, according to French et al. (2008), the CIPS may be problematic when exploring the subscales of impostorism. The subscales included *fake* items which focus on self-doubt and concerns about intellect, the *discount* questions focus on the inability to accept credit and praise for a good performance, and the *luck* items examine thoughts related to successes being due to luck or chance instead of ability (Chrisman et al., 1995; French et al., 2008). Chrisman et al. (1995) and Ibrahim et al. (2020) also identified different subscales of the impostor phenomenon. However, the current study only analyzed total CIPS scores and did not measure scores on any identified subscales of the inventory. Table 1 reports the question numbers, text, and factor loading for each question in the CIPS for the current study.

Table 1

Clance Scale Factor Analysis

Question	Question Text	Factor Loading
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.	0.93
2	I can give the impression that I'm more competent than I really am.	0.92
3	I avoid evaluations if possible and have a dread of others evaluating me.	0.92
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.	0.91
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.	0.92
6	I'm afraid people important to me may find out that I'm not as capable as they think I am.	0.91
7	I tend to remember the incidents in which I have not done my best more than those times I have done my best.	0.92
8	I rarely do a project or task as well as I'd like to do it.	0.92
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.	0.92
10	It's hard for me to accept compliments or praise about my intelligence or accomplishments.	0.92
11	At times, I feel my success has been due to some kind of luck.	0.92
12	I'm disappointed at times in my present accomplishments and think I should have accomplished more.	0.92
13	Sometimes I'm afraid others will discover how much knowledge or ability I really lack.	0.91

Table 1 (continued).

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.	0.92
15	When I've succeeded at something and received recognition for my accomplishments, I have doubts that I can keep repeating that success.	0.91
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.	0.91
17	I often compare my ability to those around me and think they may be more intelligent than I am.	0.92
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.	0.92
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.	0.92
20	I feel bad and discouraged if I'm not 'the best' or at least 'very special' in situations that involve achievement.	0.92

Note. Cronbach's alpha was $\alpha = 0.92$

Demographic Data

The total sample for this study included 829 students ($N = 829$) all of whom were at least 18 years of age and in their first or second year of study at an institution of higher education. The total sample number included all students who clicked on and opened the Qualtrics link. Of those respondents, 23.3% of the students ($n = 193$) identified themselves as public university students in their first or second year of study, and 63.3% of the students ($n = 525$) indicated they attended a community college. That means 13.4% of the respondents did not indicate which institution of higher education they attended ($n = 111$). The students who did not indicate their institution were

not included in the analysis of community college students, but they were included in the analysis of the total participant population for the study.

Total Sample Demographic Data

The total sample was 65.5% (*n* = 543) women and 18.5% (*n* = 153) men; 1.8% (*n* = 15) indicated their gender was other; and 1.3% (*n* = 11) of the respondents opted to not identify their gender. The sample was 46.3% White or Caucasian (*n* = 384), with the remaining participants self-identifying as 4.6% Asian (*n* = 38), 4.9% Hispanic or Latino (*n* = 41), 20.1% Black or African American (*N* = 167), 0.1% Native Hawaiian or Pacific Islander (*n* = 1), and 0.4% American Indian or Alaskan Native (*n* = 3). There were 3.4% of the participants who identified as "Other" (*n* = 28), and 3.5% (*n* = 29) who preferred not to respond. The under-represented minority (URM) designation was given to all the students who did not self-identify as White or Caucasian and did not indicate that they preferred not to disclose their race or ethnicity. As a result, the data indicated that 33.4% (*n* = 277) of the respondents were URM and 46.3% (*n* = 384) were not URM.

The participants self-reported disability status was to include any learning, behavioral, emotional, or physical disability. Most of the participants indicated that they had no disability (57.7%) (*n* = 478) and 22% (*n* = 182) responded in the affirmative. Of note, 5.8% (*n* = 48) were unsure of their disability status and 1.6% (*n* = 13) preferred not to answer.

The participants also self-reported whether they fit the criteria for FGS. First-generation status was defined as someone whose parent(s)/legal guardian(s) have *n*ot completed a college degree. A slight majority of participants (n = 425) in the total sample were not first- generation students (51.3%), with 32.8% (*n* = 272) of the remaining students reporting FGS and 1.6%

indicating that they were unsure (*n* = 13). Of note, 1.0% (*n* = 8) indicated that they preferred not to answer.

The participants indicated PGE status which was explained on the survey as a type of financial aid the U.S. federal government gives to students who need it to pay for college. The survey clarified that Federal Pell Grants are usually available to students with financial need, who have not earned their first bachelor's degree. Most of the participants (*n* = 301) indicated that they were PGE (36.3%) and 28.0% (*n* = 232) indicated that they were not PGE. Interestingly, 21.6% (*n* = 179) were unsure of their PGE and only 0.8% (*n* = 7) preferred not to answer. Table 2 summarizes the demographic data for the total sample.

Table 2

Demographic Data for the Total Sample

Student Characteristic	*n*	%
Gender		
Male	153	18.50%
Female	543	65.50%
Other	15	1.80%
Prefer not to Answer	11	1.30%
Missing	107	12.90%
Race/Ethnicity		
American Indian or Alaska Native	3	0.40%
Asian	38	4.60%

Table 2 (continued).

Black or African American	167	20.10%
Hispanic or Latino	41	4.90%
Native Hawaiian or Pacific Islander	1	0.10%
White	384	46.30%
Other	28	3.40%
Prefer not to answer	29	3.50%
Missing	138	16.60%
Underrepresented Minority Status		
Yes	277	33.40%
No	384	46.30%
Missing	168	20.30%
Disability Status		
Yes	182	22.00%
No	478	57.70%
Unsure	48	5.80%
Prefer not to answer	13	1.60%
Missing	108	13.00%
PGE Grant Eligibility		
Yes	301	36.30%
No	232	28.00%
Unsure	179	21.60%

Table 2 (continued).

Prefer not to answer	7	0.80%
Missing	110	13.30%
First Generation College Student		
Yes	272	32.80%
No	425	51.30%
Unsure	13	1.60%
Prefer not to answer	8	1.00%
Missing	111	13.40%

Note. Entire sample (*N* = 829)

Four-Year Public University Student Data

The four-year public university student sample was 82.9% (*n* = 160) female and 16.1% (*n* = 31) male. Only 0.5% (*n* = 1) indicated their gender was other and 0.5% (*n* = 1) of the students opted to not identify their gender. The sample was 41.5% White or Caucasian (*n* = 80), with the remaining participants self-identifying as 7.8% Asian (*n* = 15), 5.7% Hispanic or Latino (*n* = 11), 36.3% Black or African American (*n* = 70), 0.5% Native Hawaiian or Pacific Islander (*n* = 1), and none were American Indian or Alaskan Native (*n* = 0). There were 2.1% of the participants who identified as "Other" (*n* = 4), and 2.1% (*n* = 4) who preferred not to respond. The under-represented racial and ethnic minority (URM) data indicated that 51.8% (*n* = 100) of the respondents were URM and 41.5% (*n* = 80) were not URM.

The participants' self-reported disability status showed that 77.2% responded that they had no disability (*n* = 149) and 16.1% (*n* = 31) responded in the affirmative. Of note, 6.2% (*n* =

12) were unsure of their disability status and 0.5% (*n* = 1) preferred not to answer. The participants' self-reported FGS showed that 56.0% of the respondents (*n* = 108) in the four-year public university sample were not first-generation students with 42.5% (*n* = 82) of the remaining students reporting FGS and 1.0% indicating that they were unsure (*n* = 2). Of note, 0.5% (*n* = 1) indicated that they preferred not to answer. The participants reported PGE and 42.0% of the participants indicated that they were PGE (*n* = 81) and 38.3% (*n* = 74) indicated that they were not PGE. Interestingly, 18.7% (*n* = 36) were unsure of their PGE and only 0.5% (*n* = 1) preferred not to answer. Table 3 summarizes the demographic data for the four-year public university student sample.

Table 3

Demographic Data for the Four-Year Public University Students

Student Characteristic	*n*	%
Gender		
Male	31	16.1%
Female	160	82.9%
Other	1	0.5%
Prefer not to Answer	1	0.5%
Missing		
Race/Ethnicity		
American Indian or Alaska Native	0	0%
Asian	15	7.8%

Table 3 (continued).

Black or African American	70	36.3%
Hispanic or Latino	11	5.7%
Native Hawaiian or Pacific Islander	1	0.5%
White	80	41.5%
Other	4	2.1%
Prefer not to answer	4	2.1%
Missing	8	4.1%
Underrepresented Minority Status		
Yes	100	51.8%
No	80	41.5%
Missing	13	6.7%
Disability Status		
Yes	31	16.1%
No	149	77.2%
Unsure	12	6.2%
Prefer not to answer	1	0.5%
Missing	0	0%
PGE Grant Eligibility		
Yes	81	42.0%
No	74	38.3%
Unsure	36	18.7%
Prefer not to answer	1	0.5%

Table 3 (continued).

Missing	1	0.5%
First Generation College Student		
Yes	81	42.5%
No	108	56.0%
Unsure	2	1.0%
Prefer not to answer	0	0%
Missing	1	0.5%

Note. Four-year public university sample *(N = 193)*

Community College Student Data

The community college sample consisted of students from three different community colleges. Thomas Nelson had the most participants with 53.7% (*n* = 282). John Tyler came in second with 31.2% (*n* = 164) followed by Reynolds with 15.0% (*n* = 79) of the community college student sample. The community college participants were 73.0% (*n* = 383) female and 22.7% (*n* = 119) male. Only 2.5% (*n* = 13) indicated their gender was other and 1.9% (*n* = 10) of the students opted to not identify their gender. The community college sample was 57.5% White or Caucasian (*n* = 302), with the remaining participants self-identifying as 4.4% Asian (*n* = 23), 5.7% Hispanic or Latino (*n* = 30), 18.1% Black or African American (*n* = 95), 0.6% American Indian or Alaskan Native (*n* = 3), and none were Native Hawaiian or Pacific Islander (*n* = 0). There were 4.6% of the participants who identified as "Other" (*n* = 24), and 4.8% (*n* = 25) who preferred not to respond. The URM data indicated that 33.3% (*n* = 175) of the respondents were URM and 57.5% (*n* = 302) were not URM.

The participants' self-reported disability status showed 62.5% responded that they had no disability (*n* = 328) and 28.4% (*n* = 149) responded in the affirmative. Of note, 2.3% (*n* = 12) were unsure of their disability status and 0.2% (*n* = 1) preferred not to answer. The participants' self-reported FGS showed that 60.0% of the respondents (*n* = 315) in the community college sample were not first-generation students with 36.0% (*n* = 189) of the remaining students reporting FGS and 2.1% indicating that they were unsure (*n* = 11. Notably, 1.5% (*n* = 8) indicated that they preferred not to answer. The participants reported PGE and 41.9% of the participants indicated that they were PGE (*n* = 220) and 29.9% (*n* = 157) indicated that they were not PGE. Interestingly, 26.9% (*n* = 141) were unsure of their PGE and only 1.1% (*n* = 6) preferred not to answer. Table 4 summarizes the demographic data for the community college student sample.

Table 4

Demographic Data for the Community College Sample

Student Characteristics		*n*	%
College			
	Reynolds Community College	79	15.00%
	Thomas Nelson Community College	282	53.70%
	John Tyler Community College	164	31.20%
Gender			
	Male	119	22.70%
	Female	383	73.00%

Table 4 (continued).

Other	13	2.50%
Prefer not to Answer	10	1.90%
American Indian or Alaska Native	3	0.60%
Asian	23	4.40%
Black or African American	95	18.10%
Hispanic or Latino	30	5.70%
Native Hawaiian or Pacific Islander	0	0.00%
White	302	57.50%
Other	24	4.60%
Prefer not to answer	25	4.80%
Underrepresented Minority Status		
Yes	175	33.30%
No	302	57.50%
Missing	48	9.10%
Disability Status		
Yes	149	28.40%
No	328	62.50%
Unsure	35	6.70%
Prefer not to answer	12	2.30%
Missing	1	0.20%
Pell Grant Eligibility		

Table 4 (continued).

Yes	220	41.90%
No	157	29.90%
Unsure	141	26.90%
Prefer not to answer	6	1.10%
Missing	1	0.20%
First Generation College Student		
Yes	189	36.00%
No	315	60.00%
First Generation College Student		
Yes	189	36.00%
No	315	60.00%
Unsure	11	2.10%
Prefer not to answer	8	1.50%
Missing	2	0.40%

Note. Community college student sample *(N = 525)*

Missing Data Analysis

The overall sample included significant portions of missing data. According to Madley-Dowd, Hughes, Tilling, and Heron (2019), there is some evidence that five percent missing data is the upper limit for large data sets and there may be bias in analyses with more than ten percent of data missing. Since the present data set contained more than ten percent missing data, a multiple imputation was performed on the data before analyses (Rubin, 1976). Table 5 details the

amount of missing data for the community college sample, and Table 6 gives the missing data for the total participant population.

Table 5

Missing Data in Community College Sample

Variable	*Answered*	*Missing*	*Percent Missing*
URM	448	77	14.7%
Gender	470	55	10.5%
Disability	448	77	14.7%
PGE	354	171	32.6%
FGS	474	51	9.7%

Note. Community college student sample *(N = 525)*

Table 6

Missing Data in Total Sample

Variable	*Answered*	*Missing*	*Percent Missing*
College Type	667	162	19.5%
URM	615	214	25.8%
Gender	646	183	22.1%
Disability	612	217	26.2%
PGE	499	330	39.8%
FGS	649	180	21.7%

Note. Total student sample *(N = 829)*

Schafer (1999) pointed out that the practice of filling in missing data with possible values has been long used in data sets with missing data. In those situations, "Rubin's method for repeated imputation inference, each of the simulated complete datasets is analyzed by standard methods, and the results are later combined to produce estimates and confidence intervals that incorporate missing-data uncertainty" (Schafer, 1999, p.3). As such, the results of the present analyses include five sets of imputed data and results from those sets.

The SPSS v. 27 software uses sequential steps in order to analyze missing data (SPSS, 2016). The automatic selection of imputation method was selected, and the program selected the fully conditional specification method because the pattern of missing values was not monotone. Since this data set had missing values in every variable, the program created multiple imputations using an iterative procedure. As a result, SPSS v. 27 developed an imputation model for each variable by utilizing the fully conditional specification for the imputations. For each iteration of the data, SPSS v. 27 imputed missing values sequentially starting with the first variable with missing data. According to the SPSS (2016) manual:

> For a continuous variable with missing values, [the program will] use the non-missing values to find its sample mean and standard deviation, then fill in the missing values with random draws from a normal distribution with mean and standard deviation equal to the sample values, limited within the range of the observed minimum and maximum values. For a categorical variable with missing values, [the program will] use the non-missing values to find the observed proportion of each category, then fill in the missing values with random draws from a multinomial distribution with category probabilities equal to the observed category proportions. (p. 631)

It is important to note that SPSS v. 27 does not use cases where all associated variables are missing (SPSS, 2016). Of note, there was still a significant portion of missing data even after the multiple imputation procedure was completed. As a result, the analyses included 723 participants after the multiple imputation, leaving 106 participants out because of missing data.

In addition to the multiple imputation done is SPSS v. 27, another multiple imputation of the data was done using R Version 3.10-28 with added Miceadds package. Unlike SPSS v. 27, R v. 3.10-28 with the Miceadds package offered pooled results from the ANOVA. More specifically, the Miceadds Package v. 3.10-28 contains functions for multiple imputation and gives pooled results from the analyses (Grund, Luedtke, & Robitzsch, 2018; van Buuren & Groothuis-Oudshoorn, 2011). For the current study, the Miceadds package was used to get five imputed data sets after twenty imputations of the data (Robitzsch, Grund, & Henke, 2020). According to Rubin (1987) five imputations of the data should be sufficient for most applications. The Miceadds package used predictive mean matching to get five imputed data sets and one pooled data set based on the imputations (Robitzsch, Grund, & Henke, 2020). The function of the Miceadds package used "predictive mean matching where the match is based on predicted values which contain the fixed and (sampled) random effects. Binary variables can be imputed from a two-level logistic regression model" (Robitzsch et al., 2020, p. 107). According to Grund et al., (2018) when comparing the available procedures for imputing and pooling data, they found all procedures provided suitable tests of the null hypothesis in ANOVAs and multiple imputation offered a reliable effective method to address missing data.

Research Questions and Associated Analyses

Research Question 1

What are the levels of impostorism in Virginia community college student populations?

Data were analyzed using frequency distributions of answers collected from community college student responses on the CIPS. Scores on the CIPS are the result of the sum of 20 questions and scores can range from 20 to 100. According to Clance (1985), scores less than 40 denote few feelings of impostorism, scores from 41-60 show moderate feelings of impostorism, scores from 61-80 indicate frequent feelings of impostorism, and a score of 81 or higher demonstrates the respondent often experiences intense feelings of impostorism. Clance (1985) also suggested scores of 61 or higher show IP which may negatively impact a person's life and require clinical intervention. For the purposes of this study, the following ranges were used to categorize participant data:

- low impostorism (20-40)
- moderate impostorism (41-60)
- frequent impostorism (61-80)
- intense impostorism (81 and above)

In this study, 525 community college students completed the total survey, however, only 493 completed all 20 questions of the CIPS. Therefore, frequency analyses were performed using only the 493 participants who finished the entire instrument. The distribution of scores in the community college sample ranged from 25 to 98, with a mean score of 62.54 (SD = 15.67). In the community college sample, 8.0% of the respondents scored in the low impostor category (n = 42), 34.5% scored in the moderate impostor category (n = 181), 37.7% scored in the frequent impostor category (n = 198), and 13.7% scored in the intense impostor category (n = 72). Table 7

summarizes the CIPS categories for the community college sample and the four-year public university sample.

Table 7

Frequencies of Categories of the Clance Impostor Phenomenon Scale

	CC Students		4-Year Students	
Category	*n*	%	*n*	%
Low impostor	42	8.0%	22	11.4%
Moderate Impostor	181	34.5%	68	35.23%
Frequent Impostor	198	37.7%	64	33.16%
Intense Impostor	72	13.7%	20	10.36%
Missing	32	6.1%	19	0%
Total	525	100%	193	100%

Note. For the CC students $M = 62.52$, $SD = 15.67$ for the 4-Year Students $M = 60.25$, $SD = 16.03$

Research Question 2

Are there statistically significant differences in CIPS scores between community college students based on demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status (URM); (b) PGE; (c) FGS; (d) disability status; or (e) gender?

In order to test the hypothesis that demographic variables had an effect on IP scores, a between-groups ANOVA was utilized to analyze and to compare the CIPS scores of community college students based on selected demographic characteristics, a 2 (URM) X 2 (PGE) X 2 (FGS) X 2 (Disability) X 2 (Gender) factorial ANOVA was performed utilizing the imputed community

college student data. The alpha level was set to 0.05. Table 8 summarizes the numbers, means, standard deviations, skewness, and kurtosis for the community college participant sample based on the demographic variables analyzed.

Table 8

Community College Student Descriptive Characteristics

Variable	*n*	*M*	*SD*	Skewness	Kurtosis
URM	163	59.52	15.88	0.23	-0.87
Not-URM	285	64.37	14.86	-0.10	-0.68
Male	111	64.62	16.10	-0.47	-0.86
Female	359	61.94	15.52	0.14	-0.84
Disabled	141	69.01	15.35	-0.47	-0.40
Not-Disabled	307	58.65	4.53	0.14	-0.72
PGE	207	62.28	16.23	0.19	-0.96
Not-PGE	147	61.27	15.31	-0.04	-0.62
FGS	177	60.86	15.58	0.16	-0.82
Not-FGS	297	63.67	15.74	-0.10	-0.73

Note. Total $N = 525$

The overall independent between-groups ANOVA for the community college students yielded a statistically significant effect with the original data and every subsequent imputation of the data $F(30,257) = 1.54$, $p = 0.04$, $\eta^2 = 0.15$ (Original Data), $F(30,494) = 3.11$, $p < 0.01$, $\eta^2 =$

0.16 (Imputation 1); $F(31,493) = 2.72$, $p < 0.01$, $\eta^2 = 0.15$ (Imputation 2); $F(30,494) = 2.97$, $p < 0.01$, $\eta^2 = 0.15$ (Imputation 3); $F(30,494) = 2.82$, $p < 0.01$, $\eta^2 = 0.15$ (Imputation 4); $F(30,494) = 2.85$, $p < 0.01$, $\eta^2 = 0.15$ (Imputation 5). Thus, the null hypothesis of no differences between the groups was rejected. Therefore, it can be concluded that demographic variables had a significant effect on impostorism scores in the community college students. Table 9 shows the *F* statistic, significance level, and the partial η^2 for the original data and each of the five imputations.

The assumption of homogeneity of variances was not violated in the original data nor in any subsequent imputation of the data according to the Levene's test of equality of error variances. The alpha level was set at .05. The Levene's *F* test results (based on mean) did not suggest the violation of the homogeneity of variances assumption, $F(27,257) = 1.15$, $p = 0.28$ (Original Data), $F(29,494) = 1.10$, $p = 0.33$ (Imputation 1); $F(30,493) = 1.01$, $p = 0.45$ (Imputation 2); $F(28,494) = 1.00$, $p = 0.47$ (Imputation 3); $F(28,494) = 1.29$, $p = 0.15$ (Imputation 4); $F(29,494) = 0.88$, $p = 0.65$ (Imputation 5). A non-significant *p* value in the Levene's test indicates that we cannot reject the null hypothesis which is indicative of homogeneity. Table 10 shows the *F* statistic, degrees of freedom, and significance level for the original data and each of the five imputations for Levene's Test of Equality of Error Variances.

Table 9

Overall, ANOVA Results of Imputed Community College Data

Imputation	*F*	*p*	η^2
Original Data	1.54	0.04	0.15
1	3.11	<0.01	0.16
2	2.72	<0.01	0.15
3	2.97	<0.01	0.15
4	2.82	<0.01	0.15
5	2.85	<0.01	0.15

Note. N for Original data = 288; *N* for imputed data= 525

Table 10

Levene's Test Results of Imputed Community College Data

Imputation	*F*	*df*1	*df*2	*p*
Original Data	1.15	27	257	0.28
1	1.10	29	494	0.33
2	1.01	30	493	0.45
3	1.00	28	494	0.47
4	1.29	28	494	0.15
5	0.88	29	494	0.65

Note. N for Original data = 288; *N* for imputed data = 525

The Analysis of Variance (ANOVA) completed on the imputed community college student data was further analyzed to determine if there were statistically significant main effects

in CIPS scores between community college students based on URM, PGE, FGS, disability status, or gender. The findings indicated that there were statistically significant main effects for students with a disability which reached significance in the original data and every imputation of the data. In the pooled analysis of the results using the R program with the Miceadds package, a significant difference was found for the URM students. However, that significant difference was not present in the original data or the imputations of the data using SPSS v. 27.

The alpha level was set to 0.05, and for the students with a self-identified disability $F(1,257) = 9.37$, $p < 0.01$, $\eta^2 = 0.04$ (Original Data), $F(1,494) = 26.06$, $p < 0.01$, $\eta^2 = 0.05$ (Imputation 1); $F(1,494) = 32.22$, $p < 0.01$, $\eta^2 = 0.06$ (Imputation 2); $F(1,494) = 18.12$, $p < 0.01$, $\eta^2 = 0.04$ (Imputation 3); $F(1,494) = 20.12$, $p < 0.01$, $\eta^2 = 0.04$ (Imputation 4); $F(1,494) = 21.73$, $p < 0.01$, $\eta^2 = 0.04$ (Imputation 5). Table 11 shows the F statistic, significance level, and the partial η^2 for the original data and each of the five imputations for the students who indicated that they had a physical, emotional, learning, or behavioral disability

The alpha level was set to 0.05, and for the students who identified as underrepresented minority group (URM) $F(1,257) = 0.07$, $p = .80$, $\eta^2 = < 0.01$ (Original Data), $F(1,494) = 0.70$, $p = 0.40$, $\eta^2 = < 0.01$ (Imputation 1); $F(1,494) = 0.37$, $p = .54$, $\eta^2 = < 0.01$ (Imputation 2); $F(1,494) = 1.23$, $p = 0.27$, $\eta^2 = < 0.01$ (Imputation 3); $F(1,494) = 0.85$, $p = 0.36$, $\eta^2 = < 0.01$ (Imputation 4); $F(1,494) = 0.91$, $p = 0.34$, $\eta^2 = < 0.01$ (Imputation 5). Table 12 shows the F statistic, significance level, and the partial η^2 for the original data and each of the five imputations for the students who indicated they were a part of an under-represented racial/ethnic minority group. Table 13 shows the pairwise comparisons for the pooled data means, standard errors, and mean difference for the community college students based on URM and disability status.

Table 11

ANOVA Results of Imputed Community College Data for Students with a Disability

Imputation	*F*	*p*	Partial η^2
Original Data	9.37	<0.01	0.04
1	26.06	<0.01	0.05
2	32.22	<0.01	0.06
3	18.12	<0.01	0.04
4	20.12	<0.01	0.04
5	21.73	<0.01	0.04

Note. N for Original data = 288; *N* for imputed data = 525

Table 12

ANOVA Results of Imputed Community College Data for URM Students

Imputation	*F*	*p*	Partial η^2
Original Data	0.07	0.80	<0.01
1	0.70	0.40	<0.01
2	0.37	0.54	<0.01
3	1.23	0.27	<0.01
4	0.85	0.36	<0.01
5	0.91	0.34	<0.01

Note. N for Original data = 288; *N* for imputed data = 525

Table 13

Pooled Pairwise Comparisons for Community College Students

Variable	*M*	Standard Error	Mean Difference	Standard Error
URM	63.54	1.95		
Not-URM	65.82	1.13		
URM to Not-URM			-2.28	2.21
Disabled	70.54	1.94		
Not-Disabled	57.17	1.13		
Disabled to Not Disabled			11.37	2.24

Note. Total $N = 525$

Research Question 3

Are main effect demographic differences in CIPS scores qualified by interactions between different demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) PGE; (c) FGS; (d) disability status; or (e) gender?

The Analysis of Variance (ANOVA) that was completed on the imputed community college data was analyzed for any significant interactions based on URM, PGE, FGS, disability status, or gender. The results indicated that there were no statistically significant interactions in the community college students based on demographic characteristics in the original data nor in any imputation of the data.

Pooled Results

In order to further analyze significant differences, the statistical program R was utilized with added Miceadds packages to pool the results of the imputed data to find overall effects (Van

Buuren & Groothuis-Oudshoorn 2011). The results of the pooled data indicated there were significant differences in groups based on under-represented racial and ethnic minority status (URM) F (1,41.21) = 7.83, p = 0.008, η^2 = 0.02 and Disability F (1,56.76) = 35.16, $p < 0.01$, η^2 = 0.08. In addition, the pooled results did not show any significant interactions between the groups. Table 14 shows the F statistic, significance level, and the partial η^2 of the pooled data for the community college sample.

Table 14

Overall, ANOVA Results of Pooled Imputed Community College Data

Variable	*SSQ*	*df1*	*df2*	*F*	*p*	η^2
URM (U)	2640.39	1	41.21	7.83	0.01	0.02
Gender (G)	673.36	1	338.81	2.57	0.11	0.01
Disability (D)	10570.98	1	56.76	35.16	<0.01	0.09
Pell Grant (PG)	59.22	1	815.79	0.14	0.7	<0.01
First Gen. (FG)	533.76	1	195.44	1.88	0.17	<0.01
U x G	166.86	1	32.35	-0.34	1.00	<0.01
U x D	318.96	1	41.78	0.54	0.47	<0.01
G x D	107.97	1	204.16	0.21	0.65	<0.01
U x PG	42.63	1	812.57	0.08	0.78	<0.01

Table 14 (continued).

G x PG	494.21	1	233.38	1.76	0.19	<0.01
D x PG	137.13	1	65.79	0.1	0.75	<0.01
U x FG	91.4	1	93.79	0.02	0.9	<0.01
G x FG	100.54	1	1474.58	0.36	0.55	<0.01
PG x FG	351.37	1	403.44	1.3	0.25	<0.01
U x G x D	192.25	1	42.77	0.14	0.71	<0.01
U x G x PG	831.09	1	17.43	1.26	0.28	<0.01
U x D x PG	113.16	1	79.39	0.07	0.79	<0.01
G x D x PG	93.21	1	1116	0.31	0.58	<0.01
U x G x FG	23.48	1	22363.4	0.09	0.77	<0.01
U x D x FG	34.87	1	11506.2	0.13	0.72	<0.01
G x D x FG	107.86	1	88.32	0.06	0.81	<0.01
U x PG x FG	259.56	1	75.73	0.56	0.45	<0.01
G x PG x FG	37.04	1	549.9	0.03	0.86	<0.01
D x PG x FG	137.94	1	89.13	0.19	0.67	<0.01
U x G x D x PG	92.77	1	100.64	0.04	0.84	<0.01
U x G x D x FG	426.45	1	16.28	0.23	0.64	<0.01
U x G x PG x FG	261.75	1	16.32	-0.12	1.00	<0.01
U x D x PG x FG	458.77	1	24.77	0.66	0.42	<0.01
G x D x PG x FG	114.45	1	103.42	0.13	0.72	<0.01
Residual	108138.97	N/A	N/A	N/A	N/A	N/A

Note. N for Original data = 288; $R^2 = 0.15$

Research Question 4

Is there a statistically significant difference in CIPS scores between community college students and students in their first or second year at a public four-year university?

In order to test the hypothesis that there was a difference in the IP scores of community college and public 4-year university students, an independent samples *t*-test was performed on the complete imputed data set which included both community college and public four-year university students. The alpha level was set to 0.05. For the original data there was no significant difference between the groups; t (655) = 1.65, p = 0.10. The community college students (M = 62.54, SD = 15.67) had slightly higher IP scores than four-year public university students (M = 60.25, SD = 16.03). The pooled data based on the multiple imputation was also analyzed, and again the independent samples between-groups *t*-test did not yield a statistically significant difference. There was no significant effect for type of higher education institution, t (1053) = 1.68, p = 0.09, despite community college students (M = 62.49, SEM = .72) indicating higher IP scores than four-year public university students (M = 60.19, SEM = 1.21). Thus, the null hypothesis of no differences between the groups was not rejected. Table 15 shows the pooled *t* statistic, degrees of freedom, and significance level for the pooled data. Table 16 shows the descriptive statistics for the two independent groups analyzed in the *t*-test.

The assumption of homogeneity of variances was not violated according to the Levene's Test for Equality of Variances. The Levene's F test results showed, F (1,665) = 0.002, p = 0.96 (Original Data), F(1,721) = 0.06, p =0.82 (Imputation 1); F(1,721) = 0.97, p =0.33 (Imputation 2); F(1,721) = 0.00, p = 0.99 (Imputation 3); F(1,721) = 0.05, p =0.83 (Imputation 4); F(1,721) = 0.10, p = 0.75 (Imputation 5). A non-significant p value in the Levene's test indicates that we cannot reject the null hypothesis which is indicative of homogeneity. Table 17 shows the F

statistic, degrees of freedom, and significance level for the original data and each of the five imputations for Levene's Test of Equality of Error Variances.

Therefore, it can be concluded that there is no significant difference between feelings of impostorism in community college students and public four-year university students in their first or second year or study.

Table 15

Independent Samples t-test of CC vs. University Students Scores with Original and Pooled Data

	t	*df*	Sig. (2-tailed)	Mean Difference	Standard Error Difference
Original Data	1.65	665	0.10	2.29	1.39
Pooled Data	1.68	1053	0.09	2.30	1.37

Note. Values when equal variances are assumed

Table 16

Descriptive Statistics for t-test of Pooled CC and Four-Year Public University Students

	N	Mean	Std. Error Mean
CC	528.4	62.49	0.72
Four-Year	194.6	60.19	1.21
Total	723	61.34	

Table 17

Levene's Test Results of Imputed Community College Data v. Four-Year University Students

Imputation	*F*	*df*1	*df*2	*p*
Original Data	0.002	1	665	0.96
1	0.06	1	721	0.82
2	0.97	1	721	0.33
3	0.000	1	721	0.99
4	0.05	1	721	0.83
5	0.10	1	721	0.75

Note. N for Original data = 667; *N* for imputed data = 723

Research Question 5

Are there statistically significant differences in CIPS scores between community college students and students in the first or second year at a public four-year university based on demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) PGE; (c) FGS; (d) disability status; or (e) gender?

In order to test the hypothesis that demographic variables had an effect on the collective IP scores of community college and four-year public university students, a between-groups ANOVA was utilized to analyze and to compare the CIPS scores of all of the students based on selected demographic characteristics. A 2 (URM) X 2 (PGE) X 2 (FGS) X 2 (Disability) X 2 (Gender) X 2 (Institution Type) factorial ANOVA was performed utilizing all of the imputed college student data from both the community colleges and the public four-year university. The alpha level was set to .05. Table 18 gives the numbers, means, standard deviations, skewness,

and kurtosis for the community college participant sample based on the demographic variables analyzed.

Table 18

Total College Student Sample Descriptive Characteristics

Variable	*n*	*Mean*	*Standard Deviation*	*Skewness*	*Kurtosis*
Community College	493	62.54	15.67	<0.01	-0.79
4-Yr University	174	60.25	16.03	-0.03	-0.65
URM	255	58.89	16.31	0.17	-0.84
Not-URM	360	64.00	14.74	-0.06	-0.62
Male	142	64.20	16.07	0.11	-0.80
Female	504	61.23	15.66	-0.05	-0.79
Disabled	172	68.61	15.16	-0.35	-0.50
Not Disabled	440	58.32	14.93	0.10	-0.69
PGE	284	61.59	16.63	0.09	-0.90
Not-PGE	215	61.04	15.06	0.01	-0.56
FGS	253	60.81	15.60	-0.01	-0.80
Not-FGS	396	62.91	15.91	-0.03	-0.74

Note. Total $N = 829$

The overall independent between-groups ANOVA for all of the college students yielded a statistically significant effect with the original data and every subsequent imputation of the data $F(52,355) = 1.80$, $p = 0.01$, $\eta^2 = 0.21$ (Original Data), $F(56,666) = 2.25$, $p < 0.01$, $\eta^2 = 0.16$

(Imputation 1); $F(56,666) = 2.17$, $p < 0.01$, $\eta^2 = 0.15$ (Imputation 2); $F(57,665) = 2.47$, $p < 0.01$, $\eta^2 = 0.18$ (Imputation 3); $F(57,665) = 2.63$, $p < 0.01$, $\eta^2 = 0.18$ (Imputation 4); $F(57,665) = 2.36$, $p < 0.01$, $\eta^2 = 0.17$ (Imputation 5). Thus, the null hypothesis of no differences between the groups was rejected. Therefore, it was concluded that demographic variables had a significant effect on impostorism scores in the total college student sample. Table 19 shows the *F* statistic, significance level, and the partial η^2 for the original data and each of the five imputations.

The assumption of homogeneity of variances was not violated in the original data nor in any subsequent imputation of the data according to the Levene's test of equality of error variances. The alpha level was set at .05. The Levene's *F* test results (based on mean) did not suggest the violation of the homogeneity of variances assumption, $F(43,355) = 1.41$, $p = 0.053$ (Original Data), $F(52,666) = 1.11$, $p = 0.29$ (Imputation 1); $F(48,666) = 1.35$, $p = 0.06$ (Imputation 2); $F(50,665) = 1.17$, $p = 0.21$ (Imputation 3); $F(51,665) = 1.07$, $p = 0.36$ (Imputation 4); $F(50,665) = 1.11$, $p = 0.28$ (Imputation 5). A non-significant *p* value in the Levene's test indicates that we cannot reject the null hypothesis which is indicative of homogeneity. Table 20 shows the *F* statistic, degrees of freedom, and significance level for the original data and each of the five imputations for Levene's Test of Equality of Error Variances.

Table 19

Overall, ANOVA Results of Total College Student Data

Imputation	*F*	*p*	η^2
Original Data	1.80	0.01	0.21
1	2.25	<0.01	0.16
2	2.17	<0.01	0.15
3	2.47	<0.01	0.18
4	2.63	<0.01	0.18
5	2.36	<0.01	0.17

Note. N for Original data = 408; *N* for imputed data = 723

Table 20

Levene's Test Results of Imputed Data for Total College Student Sample

Imputation	*F*	*df*1	*df*2	*p*
Original Data	1.41	43	355	0.053
1	1.11	52	666	0.29
2	1.35	48	666	0.06
3	1.17	50	665	0.21
4	1.07	51	665	0.36
5	1.11	50	665	0.28

Note. N for Original data = 407; *N* for imputed data = 722

The ANOVA of the entire college student sample also suggested that there were only statistically significant main effects for students who identified as having a disability. Disability

reached significance in the original data and in every imputation of the data $F(1,355) = 25.48$, $p < 0.01$, $\eta^2 = .07$ (Original Data), $F(1,666) = 13.09$, $p < 0.01$, $\eta^2 = 0.02$ (Imputation 1); $F(1,666) = 15.75$, $p < 0.01$, $\eta^2 = 0.02$ (Imputation 2); $F(1,665) = 19.70$, $p < 0.01$, $\eta^2 = 0.03$ (Imputation 3); $F(1,665) = 20.76$, $p < 0.01$, $\eta^2 = 0.03$ (Imputation 4); $F(1,665) = 20.61$, $p < 0.01$, $\eta^2 = 0.03$ (Imputation 5). Table 21 shows the F statistic, significance level, and the partial η^2 for the original data and each of the five imputations for all of the college students who indicated that they had a disability.

The alpha level was set to .05, and for the students who identified as belonging to underrepresented minority group $F(1,355) = 0.44$, $p = 0.51$, $\eta^2 < 0.01$ (Original Data), $F(1,666) = 2.34$, $p = 0.13$, $\eta^2 = 0.004$ (Imputation 1); $F(1,666) = 0.01$, $p = 0.91$, $\eta^2 < 0.01$ (Imputation 2); $F(1,665) = 0.16$, $p = 0.69$, $\eta^2 < 0.01$ (Imputation 3); $F(1,665) = 0.15$, $p = 0.70$, $\eta^2 < 0.01$ (Imputation 4); $F(1,665) = 0.45$, $p = 0.50$, $\eta^2 < 0.01$ (Imputation 5). Table 22 shows the F statistic, significance level, and the partial η^2 for the original data and each of the five imputations for all of the college students who indicated that were part of an under-represented racial/ethnic minority group. Although URM did not reach significance in the original data or any imputation of the data, the pooled effects did reach significance. Table 22 gives the pooled results for the entire college student sample. Table 23 shows the pairwise comparisons for the pooled data means, standard errors, and mean difference for the total college student sample based on URM and disability status.

Table 21

ANOVA Results of Imputed Data for Students with a Disability

Imputation	*F*	*p*	*Partial* η^2
Original Data	25.48	<0.01	0.07
1	13.09	<0.01	0.02
2	15.75	<0.01	0.02
3	19.70	<0.01	0.03
4	20.76	<0.01	0.03
5	20.61	<0.01	0.03

Note. N for Original data = 408; *N* for imputed data = 723

Table 22

ANOVA Results of Imputed Data for URM Students

Imputation	*F*	*p*	*Partial* η^2
Original Data	0.44	0.51	0.01
1	2.34	0.13	0.004
2	0.01	0.91	<0.01
3	0.16	0.69	<0.01
4	0.15	0.70	<0.01
5	0.45	0.50	<0.01

Note. N for Original data = 408; *N* for imputed data = 771

Table 23

Pooled Pairwise Comparisons for Community College and Four-Year University Students

Variable	*M*	Standard Error	Mean Difference	Standard Error
URM	63.10	1.72		
Not-URM	64.72	1.39		
URM to Not-URM			-1.62	2.35
Disabled	69.11	1.80		
Not-Disabled	59.41	1.26		
Disabled to Not Disabled			9.70	2.26

Note. Total $N = 723$

Research Question 6

Are main effect demographic differences in CIPS scores qualified by interactions between community college students and students in the first or second year of study at a four-year public university based on the type of institution and demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?

The Analysis of Variance (ANOVA) that was completed on the total college student sample data indicated that there were no statistically significant interactions in the college students based on the institution type and demographic characteristics in the original data nor any imputation of the data.

Pooled ANOVA Results for the Entire Sample

To further examine significant differences, the statistical program R was again used with added Miceadds packages to pool the results of the imputed data to find overall pooled effects (Van Buuren & Groothuis-Oudshoorn 2011). The results of the pooled data revealed there were significant differences in groups based on under-represented racial and ethnic minority status (URM) $F(1,14.81) = 11.04$, $p = 0.01$, $\eta^2 = 0.01$ and Disability $F(1,21.93) = 39.51$, $p < 0.01$, $\eta^2 = 0.03$. In addition, the pooled results did not show any significant interactions between the groups. Table 24 shows the *F* statistic, significance level, and the partial η^2 of the pooled data for the entire college student sample.

Table 24

Overall, ANOVA Results of Pooled College Student Data

Variable	*SSQ*	*df1*	*df2*	*F*	*p*	η^2
URM (U)	1989.09	1	14.81	11.04	<0.01	0.01
College (CC)	517.2	1	299.63	2.37	0.12	<0.01
Gender (G)	476.76	1	74.34	2.69	0.11	<0.01
First Gen. (FG)	10215.78	1	133.77	0.82	0.37	0.05
Pell Grant (PG)	331.92	1	16.7	0.51	0.48	<0.01
Disability (D)	5595.5	1	21.93	39.51	<0.01	0.03
U x CC	75.6	1	67364.5	0.07	0.8	<0.01
U X G	139.35	1	157.22	0.18	0.67	<0.01
CC x G	141.79	1	164.96	0.04	0.85	<0.01
U x FG	124.11	1	340.63	0.09	0.77	<0.01

Table 24 (continued).

CC x FG	32.25	1	47.26	0.01	0.93	<0.01
G x FG	258.22	1	762.08	1.11	0.29	<0.01
U x PG	33.75	1	662.22	0.07	0.79	<0.01
CC x PG	87.73	1	66.52	-0.06	1.00	<0.01
G x PG	332.26	1	821.29	0.01	0.94	<0.01
FG x PG	66.08	1	626.33	0.44	0.51	<0.01
U x D	344.82	1	345.14	2.28	0.13	<0.01
CC x D	135.88	1	262.34	-0.01	1.00	<0.01
G x D	191.14	1	819.06	0.19	0.66	<0.01
FG x D	59.34	1	124.38	0.19	0.67	<0.01
PG x D	320.2	1	24.71	0.19	0.5	<0.01
UR x CC x G	54.76	1	6840	0.47	0.6	<0.01
UR x CC x FG	111.83	1	65.8	0.23	0.63	<0.01
UR x G x FG	186.35	1	837.43	0.21	0.65	<0.01
CC x G x FG	692.97	1	4808.58	0.18	0.67	<0.01
UR x CC x PG	477.91	1	12.87	0.23	0.64	<0.01
UR x G x PG	915.54	1	28.92	2.37	0.13	<0.01
CC x G x PG	572.7	1	610.86	0.37	0.55	<0.01
UR x FG x PG	169.88	1	16.27	0.84	0.37	<0.01
CC x FG x PG	246.54	1	37.5	1.27	0.27	<0.01
G x FG x PG	17.9	1	6236.08	0.01	0.9	<0.01
UR x CC x D	113.22	1	36.04	0.13	0.73	<0.01
UR x G x D	32.5	1	6866.75	0.07	0.79	<0.01

Table 24 (continued).

CC x G x D	92.53	1	149.73	0.09	0.77	<0.01
UR x FG x D	73.59	1	991.06	0.05	0.83	<0.01
CC x FG x D	39.55	1	89.08	0.01	0.94	<0.01
G x FG x D	312.59	1	116.23	0.11	0.74	<0.01
UR x PG D	51.33	1	309.69	0.04	0.84	<0.01
CC x PG x D	120.67	1	218.4	1.17	0.28	<0.01
G x PG x D	82.86	1	670.68	0.15	0.7	<0.01
FG x PG x D	160.37	1	3170.77	0.14	0.71	<0.01
UR x CC x G x FG	720.7	1	115.51	0.37	0.55	<0.01
UR x CC x G x PG	223.79	1	85.97	0.56	0.46	<0.01
UR x CC x FG x PG	464.91	1	20.61	1.82	0.19	<0.01
UR x G x FG x PG	204.79	1	391.67	0.73	0.39	<0.01
CC x G x FG x PG	266.38	1	173.28	0.43	0.51	<0.01
UR x CC x G x D	332.4	1	68.57	0.03	0.85	<0.01
UR x CC x FG x D	29.45	1	77.27	0.24	0.63	<0.01
UR x G x FG x D	116.95	1	81.17	1.17	0.28	<0.01
CC x G x FG x D	115.16	1	164.74	0.14	0.71	<0.01
UR x CC x PG x D	608.33	1	69.53	0.03	0.87	<0.01
UR x G x PG x D	217.17	1	50.72	0.25	0.62	<0.01
CC x G x PG x D	120.59	1	12.37	0.25	0.62	<0.01
UR x FG x PG x D	153.31	1	171.31	0.09	0.76	<0.01
CC x FG x PG x D	106.14	1	474.51	0.09	0.77	<0.01
G x FG x PG x D	271.69	1	29.81	0.22	0.64	<0.01

Table 24 (continued).

UR x CC x FG x PG x D	103512.04	1	N/A	N/A	N/A	0.5
UR x G FG x PG x D	38532.06	1	N/A	N/A	N/A	0.19
Residual	35803.41	N/A	N/A	N/A	N/A	N/A

Note. $R^2 = 0.83$

Research Question 7

Are there significant correlations between impostorism scores, self-reported GPA, and intent to persist at the current institution of higher education?

The pooled correlation results indicated that there was a significant correlation between the three variables. More specifically, IP scores were not significantly related to self-reported GPA (r [723] = 0.01, p = 0.80). However, IP scores were significantly negatively correlated with intent to persist (r [723] = -0.08, p = 0.04). It is important to note that the relationship between IP and intent to persist was significant but small. There was no correlation between intent to persist and self-reported GPA (r [723] = 0.01, p = 0.91). Table 25 shows the correlations between IP, GPA, and intent persist. Correlations that were significant (2-tailed) are marked with an asterisk. Table 26 gives the means, standard deviations, and total numbers for the original data, imputed data, and pooled data for the three variables.

Table 25

Correlations between IP, Self-Reported GPA, and Intent to Persist based on Pooled Data

		IP	GPA	Persist
Pearson Correlation	IP	1.00	0.03	-0.09*
	GPA		1.00	<-0.01
	Persist			1.00

Note. * indicates correlation was significant at the 0.05 level (2-tailed).

Table 26

Descriptive Statistics

Imputation Number		*M*	*SD*	*N*
Original data	Persist	4.00	0.98	715
	IP	61.95	15.88	672
	GPA	3.20	0.66	706
1	Persist	4.00	0.98	723
	IP	61.82	15.64	723
	GPA	3.20	0.69	723
2	Persist	4.00	0.98	723
	IP	62.08	15.73	723
	GPA	3.20	0.69	723
3	Persist	4.00	0.98	723
	IP	61.88	15.77	723
	GPA	3.20	0.69	723
4	Persist	4.00	0.98	723
	IP	61.80	15.88	723
	GPA	3.20	0.69	723
5	Persist	4.00	0.98	723
	IP	62.18	15.78	723
	GPA	3.20	0.69	723
Pooled	Persist	4.00		723
	IP	61.95		723
	GPA	3.20		723

Research Question 8

Does IP and/or self-reported GPA predict a student's intent to persist?

A regression of intent to persist on impostorism scores and self-reported GPA in the original data did not explain a significant portion of the variance in intent to persist, but it did

approach significance; F (2,648) = 2.81, MSE = 0.97, p = 0.06. Nevertheless, IP scores were a significant predictor of intent to persist in the original (non-imputed data) (b= -0.01, p = 0.02, β = -0.09), which indicated that an increase in IP scores led to a decrease in intent to persist. Table 27 gives the descriptive statistics for each variable and each imputation of the data.

A linear regression was done on the imputed total college student data sample. The results did not indicate a significant F change in the original data (R^2 = 0.01, F [2,648] = 2.81, p = 0.06), or three other imputations of the data (R^2 = 0.01, F [2,720] = 2.51 p = 0.08) (Imputation 1), (R^2 = 0.01, F [2,720] = 2.75 p =0 .07) (Imputation 3); (R^2 = 0.01, F [2,720] = 2.31 p = 0.10) (Imputation 5). However, in two imputations of the data, there was a significant change, R^2 = 0.01, F [2,720] = 3.87 p = 0.02 (Imputation 2), R^2 = 0.01, F [2,720] = 4.27 p = 0.01 (Imputation 4). Table 28 gives the Model summary and F statistics for the linear regression. Table 29 gives the regression ANOVA results which include the F statistics and significance levels for each imputation of the data. The research was designed to determine the influence IP scores and GPA had on intent to persist. Therefore, intent to persist was regressed on IP and GPA. The overall multiple regression was not statistically significant in every imputation of the data, and the two variables (IP and self-reported GPA) only accounted for about 1% of the variance in intent to persist.

Further analysis revealed that only impostorism score was a significant predictor of intent to persist in the original data and all imputations of the data. The pooled unstandardized regression coefficient (b) for impostorism score was -0.01 (t [712] = -2.36, p = 0.02). This finding suggests that for each increase in IP score, intent to persist decreased by 0.01 points. However, GPA was not a significant predictor of IP in the original data nor any subsequent

imputation of the data. Table 30 shows the standardized and unstandardized coefficients for IP and GPA.

Table 27

Descriptive Statistics for Regression

Imputation Number		*M*	*SD*	*N*
	Persist	3.98	0.99	651
Original data	IP	61.98	15.88	651
	GPA	3.21	0.69	651
	Persist	4.00	0.98	723
1	IP	61.82	15.64	723
	GPA	3.20	0.69	723
	Persist	4.00	0.98	723
2	IP	62.08	15.73	723
	GPA	3.20	0.69	723
	Persist	4.00	0.98	723
3	IP	61.88	15.77	723
	GPA	3.20	0.69	723
	Persist	4.00	0.98	723
4	IP	61.80	15.88	723
	GPA	3.20	0.69	723
	Persist	4.00	0.98	723
5	IP	62.18	15.78	723
	GPA	3.20	0.69	723
	Persist	4.00		723
Pooled	IP	61.95		723
	GPA	3.20		723

Table 28

Regression Model of IP and GPA and Intent to Persist

Imputation	*R*	*R* Square	Adjusted *R* Square	Standard Error of the Estimate	Significant *F* Change
Original	0.09	0.01	0.01	0.98	0.06
1	0.08	0.01	<0.01	0.98	0.08
2	0.10	0.01	0.01	0.97	0.02
3	0.09	0.01	0.01	0.98	0.07
4	0.11	0.01	0.01	0.98	0.01
5	0.08	0.01	<0.01	0.98	0.10

Note. Dependent variable= Intent to persist

Table 29

Regression ANOVA

Imputation		Sum of Squares	*df*	Mean Square	*F*	Sig.
Original	Regression	5.44	2	2.72	2.80	0.06
	Residual	626.91	648	0.97		
	Total	632.35	650			
1	Regression	4.82	2	2.41	2.51	0.08
	Residual	690.23	720	0.96		

Table 29 (continued).

	Total	695.04	722			
2	Regression	7.34	2	3.67	3.87	0.02
	Residual	682.90	720	0.95		
	Total	690.24	722			
3	Regression	5.27	2	2.63	2.75	0.07
	Residual	689.66	720	0.96		
	Total	694.93	722			
4	Regression	8.12	2	4.06	4.27	0.01
	Residual	685.31	720	0.95		
	Total	693.44	722			
5	Regression	4.45	2	2.22	2.31	0.10
	Residual	693.29	720	0.96		
	Total	697.73	722			

Table 30

Regression Coefficients

Imputation Number	Model		Unstandardized Coefficients		Standardized Coefficients		
			B	Std. Error	Beta	*t*	Sig.
Original data	1	(Constant)	4.24	0.24		18.02	<0.01
		IP	-0.01	<0.01	-0.09	-2.32	0.02
		GPA	0.03	0.06	0.02	0.52	0.60
1	1	(Constant)	4.29	0.22		19.30	<0.01
		IP	-0.01	<0.01	-0.08	-2.24	0.03
		GPA	0.01	0.05	0.01	0.22	0.83
2	1	(Constant)	4.38	0.22		19.84	<0.01
		IP	-0.01	<0.01	-0.10	-2.78	0.01
		GPA	0.01	0.05	0.01	0.13	0.90
3	1	(Constant)	4.38	0.22		19.64	<0.01
		IP	-0.01	<0.01	-0.09	-2.33	0.02
		GPA	-0.01	0.05	0.01	-0.25	0.80
4	1	(Constant)	4.36	0.22		19.93	<0.01
		IP	-0.01	<0.01	-0.11	-2.92	<0.01
		GPA	0.02	0.05	0.01	0.30	0.76
5	1	(Constant)	4.33	0.22		19.41	<0.01
		IP	-0.01	<0.01	-0.08	-2.14	0.03
		GPA	-0.01	0.05	-0.01	-0.14	0.89
Pooled	1	(Constant)	4.35	0.23		19.25	<0.01
		IP	-0.01	<0.01		-2.33	0.02
		GPA	0.003	0.06		0.05	0.96

Note. Dependent Variable = Persistence

Conclusions

There were several important outcomes in the current research. The first finding was that community college students often experience feelings of impostorism. In the sample of 525 community students, approximately 86% reported moderate, frequent, or intense feelings of impostorism. Only eight percent reported low feelings of impostorism. There were similar levels of impostorism in community college students and public four-year university students in their first or second year of study. Of note, students with a diagnosed learning, behavioral, emotional, or physical disability experienced significantly higher levels of IP than students without a diagnosed disability. Another significant finding was in the levels of impostorism among students of color. Although this outcome should be interpreted cautiously because it was not present in the original (non-imputed) data, the evidence suggested that White students may experience higher levels of impostorism than do under-represented racial and ethnic minority students at both the community college and the four-year public university. Finally, a significant relationship was revealed between IP scores and intent to persist. The data suggested impostorism significantly predicted intent to persist.

CHAPTER V

DISCUSSION

Overview of the Problem

This research examined the impostor phenomenon (IP) in community college and four-year public university students in their first or second year of study. Impostorism is the feeling that you are a fraud and do not deserve the status or accomplishments you have earned (Clance, 1978). The impostor phenomenon has been extensively studied in higher education, but community college (CC) students have been largely omitted from the literature (Parkman, 2016). It is important to examine IP at CCs because community colleges are often the entry point to postsecondary education for students of color, first generation students, economically challenged students who are eligible for Pell Grants, and students with disabilities. Impostor phenomenon has been associated with several deleterious psychological and behavioral outcomes in the literature and it has the potential to negatively affect student performance and sense of well-being (Parkman, 2016). In addition, because enrollment in higher education institutions have been declining and persistence to completion is the goal, it is important to examine any factor that could affect student success in postsecondary education, particularly at community colleges.

Purpose of the Study

The purpose of this study was to examine impostorism among Virginian community college students and students who are in their first or second year at four-year public universities. Using the Clance Impostor Phenomenon Scale (CIPS), this non-experimental quantitative study compared impostorism scores for community college students to the scores of first- and second-year public four-year university students. Additionally, the study explored whether variables such as gender, race/ethnicity, first generation status, Pell Grant eligibility, and disability status

affected the CIPS scores of community college students. Analysis of two outcome measures were examined with relation to IP scores. More specifically, self-reported grade point average (GPA) and intent to persist were evaluated for their relationship to impostorism scores. Finally, the predictive power of IP and GPA on intent to persist was also explored.

Research Questions

The study was guided by the following research questions:

1. What are the levels of impostorism in Virginia community college student populations?
2. Are there statistically significant differences in CIPS scores between community college students based on demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?
3. Are main effect demographic differences in CIPS scores qualified by interactions between different demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?
4. Is there a statistically significant difference in CIPS scores between community college students and students in their first or second year at a public four-year university?
5. Are there statistically significant differences in CIPS scores between community college students and students in the first or second year at a public four-year university based on demographic characteristics: Specifically, (a) under-represented

racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?

6. Are main effect demographic differences in CIPS scores qualified by interactions between community college students and students in the first or second year of study at a four-year public university based on the type of institution and demographic characteristics: Specifically, (a) under-represented racial/ethnic minority status; (b) Federal Pell Grant eligibility; (c) first generation status; (d) gender; or (e) disability status?
7. Is there a significant relationship between impostorism scores, self-reported GPA, and intent to persist at the current institution of higher education?
8. Does level of impostorism or self-reported GPA predict intent to persist?

Overview of the Methodology

This study utilized a non-experimental quantitative research methodology to address the research questions. The Clance Impostor Phenomenon Scale (CIPS) (Clance, 1985) was used to examine the levels of impostorism in community college and public four-year university students in their first or second year of study at Virginian institutions of higher education. The CIPS has been validated and normed on several populations of students in the literature, and it is the most widely used measure of impostorism (Chrisman et al., 1995; Parkman, 2016). In addition to IP levels, demographic information was also gathered and examined in relation to feelings of impostorism.

Data Collection

Participants were recruited from three community colleges within the Virginia Community College System (VCSS) and one public four-year university that was also located in

Virginia. Students from the university were in their first or second year of study. Participants had to be eighteen or older, and dual enrollment students were excluded. Consent was collected electronically, and both the Clance Impostor Phenomenon Scale (CIPS) and a short demographic questionnaire were administered via Qualtrics. Completion of the survey took less than ten minutes for most participants. Participants were allowed to give their personal email for a chance to win a gift certificate for their participation. The survey was open for almost the entire Spring semester of 2020. It is important to note the unique circumstances of the time period. The novel Corona Virus (COVID-19) caused instruction to move online for all educational institutions. The impact of the abrupt changes caused some challenges in collecting data and could have affected the results.

The CIPS has a Likert-type scale that ranges from 1 (“not at all true”) to 5 (“very true”) (Clance, 1985). The numbers were added together for each of the twenty items and scores ranged from 20 to 100 (Clance, 1985). Scores of 41-60 indicate moderate levels of impostorism, 61-80 show frequent IP feelings, and 81 and above indicate frequent feelings of impostorism (Clance, 1985). A short demographic questionnaire was included after the CIPS scale. The questions included information about gender identity, under-represented racial/ethnic minority status (URM), Pell Grant eligibility (PGE), self-reported disability status, and first-generation status (FGS). There were also questions included about current credit hours, intent to persist, and self-reported current grade point average (GPA). The numbers for each of the three persistence questions were averaged together for a total persistence score. The self-reported GPA score was accessed by asking the following “What is your current grade point average on a 4-point scale? Keep in mind that in general an A = 4.0, B= 3.0, C= 2.0, and a D= 1.0.” There was a place for students to type in their GPA.

Data Analysis

Data were analyzed using SPSS version 27 and R Version 3.10-28 for Statistical Computing with added packages. The Miceadds Package v.3 10-28 was deployed for the multiple imputation and analysis of pooled data in R Program. The Miceadds Package v. 3 10-28 contains functions for multiple imputation and includes several methods for the imputation and gives pooled results from the analyses (Grund, Luedtke, & Robitzsch, 2018; van Buuren & Groothuis-Oudshoorn, 2011). The data were also imputed using SPSS v. 27, however, SPSS v. 27 does not provide pooled ANOVA results after a multiple imputation (SPSS, 2017). The R Program with the Miceadds Package v. 3 10-28 included plausible value imputation of variables, multilevel imputation of variables, imputation using partial least squares regression, nested multiple imputation, substantive model compatible imputation, and features to generate synthetic datasets (van Buuren & Groothuis-Oudshoorn, 2011; van Buuren, 2018).

Frequency analyses using SPSS were explored to look at levels of impostorism in the community college sample. Clance (1985) suggested the following groupings: scores of 41-60 indicate moderate levels of impostorism, 61-80 show frequent IP feelings, and 81 and above indicate frequent feelings of impostorism and they were utilized in the frequency distributions for the research. The community college students from all three institutions were grouped based on their levels of impostorism and the descriptive statistics were reported indicating the percentages of community college students at each level of IP.

An independent samples *t*-test was used to investigate significant differences between impostorism scores in community college students and public four-year university students in their first or second year of study. An independent samples *t*-test was done with SPSS v. 27 to

assess significant group differences. Descriptive statistics were also reported, and pooled results were reported.

A factorial analysis of variance (ANOVA) was utilized to analyze significant group differences in impostor phenomenon (IP) scores. To analyze and compare the CIPS scores of community college students based on selected demographic characteristics, a 2 (URM) X 2 (PGE) X 2 (FGS) X 2 (Disability) X 2 (Gender) factorial ANOVA was utilized. Descriptive statistics were reported. In addition, contrasts were investigated, more specifically, both main effects and all interactions were examined using R Program. Similarly, for the research questions about significant differences between public four-year university students in their first or second year of study and community college students, another factorial ANOVA was done using R Program with added packages. A 2 (URM) X 2 (PGE) X 2 (FGS) X 2 (Disability) X 2 (Gender) X 2 (Institution type) ANOVA was deployed to look at the main effects of group differences, to examine significant differences based on demographic characteristics, and to analyze any possible interactions based on institution type and demographic characteristics. An alpha level of 0.05 was utilized to determine statistical significance and both comparisons and interactions were analyzed based on the research questions.

Correlations were investigated to determine the relationships between impostorism, intent to persist, and self-reported GPA. Although these variables were not focused on in the literature on impostor phenomenon, they were heavily researched in relation to persistence to completion. A correlation is the appropriate analysis to look at relationships between variables and levels of impostorism (Keith, 2015). Finally, a linear regression was analyzed to determine if intent to persist was predicted by IP scores or self-reported GPA. Descriptive statistics which included group means and standard deviations were obtained to summarize and describe the data.

Because there was a high proportion of missing data (more than ten percent) multiple imputations were undertaken to analyze the data and minimize possible bias. According to Madley-Dowd et al. (2019), there is some evidence that five percent missing data is the upper limit for large data sets and there may be bias in analyses with more than ten percent of data missing.

Summary of Major Findings

There were several important findings in the research. The first major discovery was that community college students often experience feelings of impostorism. In the sample of 525 community students, approximately 86% reported moderate, frequent, or intense feelings of impostorism. That indicated four out of five community college students experienced feelings of impostorism. Only eight percent reported low feelings of impostorism. The data did not indicate there were significant differences between levels of impostorism in community college students and public four-year university students in their first or second year of study. However, there were some other significant differences discovered in the study.

One noteworthy disparity was in the levels of impostorism reported in students with a diagnosed learning, behavioral, emotional, or physical disability. In both the community college and public four-year university students in their first or second year of study, the students with a diagnosed disability reported significantly higher levels of IP than the non-disabled students. Another significant dissimilarity was in the levels of impostorism among students of color. Although this finding should be interpreted more cautiously because it was not present in the original (non-imputed) data, the evidence suggested White students may experience slightly higher levels of impostorism than do under-represented racial and ethnic minority students at

both the community college and the four-year public university. Finally, an important relationship was uncovered between IP scores and intent to persist.

Findings Related to the Literature

The impact and pervasive nature of impostorism have been widely researched and analyzed (Bravata et al., 2019). Since its discovery and description in 1978, there have been several studies that have unearthed its presence and impact in various populations both in America and internationally (Bravata et al., 2019; Chae et al., 1995; Clance, 1978). The literature on impostorism in higher education is substantial, and it implies that the impostor phenomenon is not only ubiquitous but also impactful across institutions of higher education (Parkman, 2016). This study adds to the literature by extending empirical research on impostorism to include community college students. It also compares community college students to public four-year university students in their first or second year of study.

Although there is a substantial body of literature about impostorism in four-year college student populations, community college students have been largely left out of the discussions (Parkman, 2016). As a result, we know very little about how community college students experience and deal with feelings of fraudulence. There has been evidence to suggest that impostorism can lead to several undesirable mental health and behavioral consequences and to more negative views of post-secondary institutions overall (Clance, 1985; Havey, 1981; Tao & Gloria, 2019). In general, impostorism has been linked to an escalation of psychological discomfort and a reduction in overall mental health (Henning, Ey, & Shaw, 1998). One serious behavioral consequence accompanying IP is the reluctance to put oneself into situations where remarkable successes could occur (Clance, 1985; Henning, Ey, & Shaw, 1998; Lige, Peteet, & Brown, 2017).

Interestingly, the community college student levels of impostorism discovered in the current study were similar to those Tigranyan et al. (2020) found in PhD students where 88% of students reported moderate or higher feelings of IP. Parkman (2016) examined the incidence and impact of IP in higher education. She discovered that higher education institutions contributed to increases in feelings of impostorism, and the current study showed community college students are not immune from that experience (Parkman, 2016). Students at the community colleges also experienced elevated levels of IP. According to Parkman, institutions of higher education often include repeated assessments, competitiveness, and isolation all of which can cause college students to feel like they do not measure up (2016).

Slank (2019) described environments that contribute to feelings of impostorism. She claimed surroundings are significant because "phenomena cannot be adequately appreciated unless we widen the scope of our view, shifting focus from individual psychological mechanisms to the social structure through which those mechanisms operate" (Slank, 2019, p. 213). Environments that are beneficial to IP tend to have a genius culture where intelligence is viewed as "fixed and innate rather than malleable and teachable" (Slank, 2019, p. 214). The current investigation revealed community college students have high levels of impostorism which alludes to an atmosphere or culture that generates or maintains feelings of fraudulence. Additionally, the negative relationship discovered between IP and intent to persist in the current study supports the idea that college campuses might not promote the belief that success is attainable.

The current study did not find any significant differences between females and males in the community college sample or in the total college student sample of over seven hundred students. This finding was similar to several other studies that found no gender differences in IP

scores (Clance & O'Toole, 1987; Jarrett, 2010; Langford & Clance, 1993). Impostorism was first identified in high achieving women (Clance, 1985b). However, subsequent research has revealed mixed outcomes when it came to gender differences in feelings of IP (Bravata et al., 2019; Clance & O'Toole, 1987; McGregor et al., 2008). In their analysis of the literature, Bravata et al. (2019) uncovered seventeen studies that did not find women had significantly higher levels of impostor feelings than did men. However, sixteen studies did find significant differences with women having more IP feelings than men (Bravata et al., 2019).

Some studies have indicated increased feelings of impostorism in female college students (French et al., 2008; Gibson-Beverly & Schwartz, 2008; Oriel et al., 2004). However, other research has suggested that there were no significant gender differences in levels of IP in college student populations (Clance & O'Toole, 1987; Jarrett, 2010; Langford & Clance, 1993). The current study did not find significant differences based on gender. However, that may have been the result of the participants. The sample came from students who were just beginning their higher education journey. If the sample had included upper-class students and/or graduate students, the results may have been different. Chakraverty (2019) discovered gender differences in IP for graduate students. Female students experienced higher levels of impostorism, especially in their first semester of graduate school. It also possible that choice of major factors into feelings of impostorism. There is some research that suggests female students in STEM majors may experience higher levels of IP than their male counterparts (Chakraverty, 2019).

When it comes to under-represented racial and ethnic minority students (URM), the literature suggests that they may experience higher levels of IP than other students (Graham & McClain, 2019; Le, 2019; Wei, et al., 2020). Although there was an implication that there were significant differences between minority and non-minority students in the present study, the

results implied Non-URM students reported higher levels of impostorism than did URM students. That was true for both the community college sample and the total college student sample analyzed. It is important to note that the difference between the students based on under-represented racial and ethnic minority status may have been statistically significant in the pooled imputed data sets, but they were not consequential in the sense that all groups scored relatively high. The meaningfulness of the statistically significant difference is critical in interpreting the results. In light of the relatively high scores for both subgroups, especially given the relatively small eta-squared effect size, the difference in the pooled imputed data sets must be interpreted carefully if at all.

One reason for the difference in findings based on URM may have been because of the groupings of under-represented racial and ethnic minority students. For the present study, all students who did not self-identify as White or indicate that they would prefer not to respond were placed in the URM category. The resulting URM designation included not only African American and Latinx students, but it also had Asian students and those who identified as other. The diversity of the URM group could have led to the conflicting findings.

Previous research has established that Asian students tend to have the highest levels of impostorism; however, this study only contained thirty-one Asian students which was only 4.6% of the total sample (Cokley et al., 2012, Cokley et al., 2017, We et al., 2020). Only 4.4% or twenty-three participants of the community college sample identified as Asian. The lack of representation from the Asian students may have been the reason the URM students had lower IP scores than the White students.

Another reason for the curious finding may have been the institutions surveyed. Bernard et al. (2017) found primarily white institutions could influence feelings of impostorism in

African American students. Cokley et al. (2017) exposed similar increases in IP for Hispanic students on primarily white college campuses. However, when looking at the participants in the current study, a majority of the community college students were from Thomas Nelson (53.7%), and it is one of the few community colleges in the Virginia Community College System (VCCS) where most of the students identify as a racial or ethnic minority. The other two community colleges also reported large proportions of racial and ethnic minority students. The same is true for the public four-year university, where only 47% of the student population identified as White. Therefore, most of the college students included in the analyses came from institutions with large racial and ethnic minority populations.

The current study is inconsistent with several previous studies that have found racial and ethnic minority students to experience higher levels of impostorism (Graham & McClain, 2019; Le, 2019; Wei et al., 2020). Although, the pooled analysis found significant differences based on URM, the difference in the original data did not reach significance and the mean differences in the scores were minimal. Therefore, the identified differences in IP in the racial and ethnic minority groups based on the imputed and pooled data using the R-Program requires some caution in its interpretation.

One of the most robust findings of the research was the significant disparities in feelings of impostorism for students who reported having a diagnosed disability. The significant differences were present in the original data, every imputation of the data, and the pooled results. The diagnosed disabilities included learning, behavioral, emotional, and physical disabilities. Students with disabilities had considerably higher levels of impostorism in the community college sample and in the total college student sample. This finding was consistent with the prior research on college students with disabilities (Shessel & Reiff, 1999; Sukhai & Mohler, 2017)

Unfortunately, previous research on IP and students with a disability has been minimal. Part of the reason for the apparent lack of research may have been because historically, students with diagnosed disabilities were not encouraged to seek higher education (Madaus et al., 2012). It took changes in federal legislation to increase access for disabled students (Madaus et al., 2012). Recent data has shown an increase in the number of college students with disabilities and the expectation that the numbers will continue to rise (NCES, 2019). In addition, most students with a diagnosed disability will start their post-secondary career at a community college (NCES, 2019). Community college students are not as widely researched as students of four-year institutions.

Because impostorism has been linked with several negative consequences in the literature, it is important to identify students who may be suffering the most from its effects (Parkman, 2016). Since the college students who had a diagnosed disability had higher levels of IP than any other group identified, it can present the largest challenge for those students. Sukhai and Mohler (2017) also recognized the problem that IP posed for disabled students. They affirmed that disabled students in post-secondary institutions are exposed to the perception that they do not belong (Sukhai & Mohler, 2017). Students may also experience a lack of accommodations and limited access to peers, mentors or role models who have disabilities (Sukhai & Mohler, 2017).

The current research was different than previous studies with disabled students because it was a quantitative analysis of impostorism in college students. It had a larger sample than previously identified studies and included students at the community college (Shessel & Reiff, 1999). Although students with disabilities are not a monolithic group, their increased levels of impostorism speak to some similarities in their experiences with institutions of higher education.

This discovery of the relationship between IP and intent to persist was similar to the Tao and Gloria (2019) finding that IP was negatively correlated to persistence. However, their study focused on female graduate students (Tao & Gloria, 2019). The current study included both male and female students who are just beginning their journey in higher education. Nonetheless, the results were similar in that feelings of impostorism were related to and predicted intent to persist. The Tao and Gloria (2019) research also linked IP with less self-efficacy, more negative views about the institution, and more doubtful attitudes about finishing their degree. The lack of a significant relationships between IP and self-reported GPA was similar previous research which has found impostorism to be unrelated to grades (Bernard et al., 2002; Blondeau & Awad, 2018; Gibson-Beverly & Schwartz, 2008; Thompson et al., 1998).

Unanticipated Findings

One of the most surprising discoveries was the lack of significant differences in levels of impostorism based on some of the demographic variables investigated. Previous research has implied that variables like gender, Pell Grant eligible, and first-generation student could affect IP experiences (Clance, 1985b; Bravata et al., 2019; Lige, Peteet, & Brown, 2017; MacInnis et al., 2019). However, the current research did not find significant differences in impostorism based on several demographic variables.

The apparent lack of interactions between the demographic variables and feelings of impostorism were also surprising. Prior research inferred that there may have been some interactions between variables like gender, minority status, PGE, and FGS. For example, Martin (2018) found that 90% of female first-generation students experienced IP and many had frequent feelings of impostorism. Similarly, Le (2019) found first generation students of color had intersectional identities which influenced their feelings of IP. The students were also more likely

to qualify for Pell grants which would imply some interactions in their levels of IP (Martinez et al., 2009). However, no such interactions were discovered in the present study.

Discussion

The biggest take away from this research was the finding that impostor phenomenon was ubiquitous in college students from all types of institutions. There was a lack of significant differences between community college and public four-year university students in their first and second year of study when it comes to feelings of impostorism. Impostor phenomenon was pervasive in all college students in their first or second year of study at all post-secondary institutions and it was significantly correlated to their intent to persist. That discovery speaks to the similarities in the experiences of the college student population at both types of institutions. Community college students feel similarly high levels of IP as students at four-year public universities in their first and second year of study. Historically, and presently, community colleges have been viewed as both qualitatively and quantitatively different than four-year institutions. Community colleges have given access to higher education to groups that have been traditionally excluded. That may be part of the reason why racial and ethnic minorities and disabled students are still more likely to start their post-secondary careers at the community college (NCES, 2019). However, the community college experience does not shield students from feelings of fraudulence. As we move towards making community college even more accessible, through free tuition or added incentives to attend, it is imperative that we put safeguards in place to prevent losing students who still feel like they have not earned their place.

The student populations that are most affected by higher levels of impostorism are the ones that need special attention and targeted interventions to ensure their success. Only about 12% of disabled students attend college; of that number, 25% will drop out without returning in

their first year, and almost 37% will drop out without returning in their second year (NCES, 2019). The implication is that students with a diagnosed psychological, behavioral, emotional, or physical disability are less likely to succeed in post-secondary education. It is imperative to uncover the conditions and circumstances that may lead to the lack of access and persistence in any at risk college student population. There are similar differences in the rates of persistence to completion for under-represented ethnic and racial minority students (NCES, 2019). According to de Brey, Musu, McFarland, Wilkinson-Flicker, Diliberti, Zhang, Branstetter, and Wang (2019) college enrollment decreased for most racial and ethnic minority groups starting in 2010. The graduation rates also showed significant differences, and only 54% of Hispanic and 40% of Black college students who started in 2010 graduated within six years. It is important to recognize the variables that may impede persistence to completion, and impostorism should be considered.

Recommendations for Practitioners and Leaders

The hope in conducting this study was that the results would help both college administrators and stakeholders gain insight into the student populations that may suffer the most from experiences of impostorism. The recommendations for the practitioners and leaders in institutions of higher education focus on the availability of mental health services, mentors, and coaches for students. In addition, special attention should be given to the social and structural supports for students and the implications for policies. Because community college students have been largely omitted from the research on impostorism, it is imperative to address IP with CC student populations expeditiously. Research has shown us that impostorism can have destructive consequences, not the least of which is a lack of student retention. Persistence to completion is a

concern for all post-secondary institutions but especially community colleges (Lige et al., 2017; Parkman, 2016). The observed relationship between IP and intent to persist cannot be ignored.

The first suggestion is for community college leaders, stakeholders, and practitioners specifically. The current investigation reveals that community college students experience similar levels of IP as do students at four-year institutions. The implication is that just because community colleges open their doors to everyone, the result is not necessarily more feelings of belongingness or authenticity. Community college students have noteworthy feelings of impostorism which should be addressed. Gates et al. (2018) considered targeting IP in community college students exclusively. They recommended incorporating different types of pedagogy where community college students can integrate themselves in the learning environment to interrupt feelings of impostorism (Gates et al., 2018). As the discussions about free community college increase, and the availability of traditional students decreases, stakeholders and policy makers at community colleges have to address not only access but also student success, and impostorism needs to be a part of that conversation.

The first step in lessening the impact of IP is awareness (Clance, 1985b; Langford & Clance, 1993). The knowledge gained in this research could be used to provide targeted interventions for the student populations most at risk across institutions. More specifically, because IP is related to serious deleterious mental health and behavioral consequences, post-secondary leaders and decision makers should provide mental health resources as a part of their support services for students (Kets de Vries, 2005; Leary et al., 2000; Thompson et al., 1997). Because many community colleges do not have the means to provide mental health resources on campus, there needs to be a way to provide students with free and accessible community resources with minimal difficulty.

The most recommended treatment for IP is therapy (Clance & O'Toole, 1987; Langford & Clance, 1993; Matthews & Clance, 1985; Topping & Kimmel, 1985). Since the current study found no significant differences between community college and four-year public university students, all post-secondary institutions should provide access to mental health services for students. Clance and Imes (1978) suggested a multi-modal therapeutic methodology that included aspects of conscious awareness/mindfulness, group work, journaling accomplishments, and features of cognitive behavioral techniques. Because IP is often an issue people suffer with alone and in silence, group counseling can offer a sense of release (Clance & Matthews, 1985). Groups also offer a chance for college students to recognize that they are not alone. Social supports are essential in treating IP (Clance, 1985b; Flora, 2016; Hutchins, 2015).

It is also recommended that students be provided with mentors or coaches starting in their very first year of study. College leaders and practitioners should recognize the significance of mentors and coaches. They not only provide social supports to combat feelings of impostorism, but they also help with social withdrawal, self-efficacy, and resilience (Sanford et al., 2015; Vergauwe et al., 2015; Zanchetta et al., 2020). Graham and McClain (2016) found students with mentors had better adjustment and felt more belongingness with their schools. Institutions that do not have mentor programs in place, should seriously consider implementing them. Mentors are valuable for students and professionals in many ways. Representation matters. Mentors that come from similar demographic groups may help students develop a growth mindset where they believe they can also succeed and deserve their successes (Claro et al., 2016; Zanchetta et al., 2020).

The discoveries in this study about students with a diagnosed disability should inspire practitioners and administrators at all post-secondary institutions to closely examine the policies,

experiences, and accommodations for their disabled students. According to recent data from the NCES (2019), students will a diagnosed disability are less likely to enroll in college and are more likely to drop-out. One of the most discouraging tasks for many disabled students may be the need to self-disclose their disability status to others (Sukhai & Mohler, 2017). For new college students, the stigma and stereotypes associated with their disabilities in addition to the need for special accommodations may cause and amplify their feelings of IP. College leaders and policy makers should closely examine how disabled students are identified and aided. Policies about disclosure of invisible disabilities and how all accommodations are applied should be reviewed. For physical disabilities, campus spaces such as classrooms and gathering areas need to be evaluated. As stated before, representation matters. Disabled students should see professors and administrators with disabilities on campus, and discussions should be had about how faculty and staff self-disclose their own diagnosed disabilities.

Although the finding about under-represented racial and ethnic minority students should be accepted with caution and needs replication, it is important to note the White students had higher levels of IP than did the non-White students. Part of the reason for the difference could have been the institutions studied. Each of the four post-secondary institutions in this study had significant percentages of minority students. As a result, the experience of impostorism may have been lessened for the racial and ethnic minority students. In addition, it is important to note that all students who did not self-identify as White, or indicate that they would prefer not to answer, were categorized as an under-represented ethnic or racial minority group member. The way students were labeled for the analyses may have caused the contradictory findings. Racial and ethnic minority groups are in no way monolithic and the classification of all non-White students together did not show the differences in levels of IP in the different groups. As

institutions continue to change and adjust their admission criteria, the need for diversity and inclusion should continue to be a consideration. Because IP is related to intent to persist, and the student bodies of the institutions influence feelings of impostorism, college leaders need to consider increasing diversity and representation at their colleges (Stone et al., 2018).

Recommendations for Further Research

As with any research, there were some places where this study could be improved upon and expanded. The first limitation was in the sample. This research was only conducted with institutions in Virginia with a limited number of institutions and volunteer student participants. The self-selected sample limits the generalizability of the results to other college students. The sample did not include randomization, and all students who completed any part of the survey were included. Future research should look at more community colleges across the nation and compare them with public four-year university students from different states and countries. The impact of the international pandemic could have also affected the data collection.

It is important to recognize the influence of COVID-19 on the world, post-secondary institutions, and the current study. The semester when data was gathered was unlike any other in history. All post-secondary institutions moved instruction entirely online. As a result, students' lives were disrupted, and they were not allowed to be on any of the college campuses. Many students were forced to move out of dormitories and campuses became like ghost towns. The unprecedented circumstances of the semester necessarily affected data collection and the results of the current study.

There was a large amount of missing data in the final data set which is another limitation of the present study. Maybe because there was little incentive given for participation, and the data were collected completely online, participants did not feel any real need to fully complete

the questionnaire. Future research should consider more incentive, face to face administration of the surveys, and some method of checking for completion before submission. The missing data could have affected the results of the analyses. Of the missing data, Pell Grant eligibility was the most unanswered question. Upon further review of the original data, 21.6% of the total college student sample and 26.9% of the community college student sample indicated that they were unsure if they were Pell Grant eligible. A more objective measure of Pell Grant eligibility or household income would give a more accurate picture of the influence of income status on feelings of fraudulence.

Because there was a significant difference in the IP scores of students with a diagnosed disability, future research should analyze the differences by type of disability to determine if certain disability types lend themselves to higher levels of impostorism. For the purposes of this study, students were asked if they had a diagnosed physical, emotional, behavioral, or learning disability. All the students who indicated any disability were put together into one group. The same was true for under-represented racial and ethnic minority groups. Any student who did not self-identify as White, or indicate that they would prefer not to answer, was put into the under-represented racial and ethnic minority group. Further analysis should be done to determine if there are specific sub-groups within the under-represented racial and ethnic minority group that experience higher levels of IP than others.

Similarly, since there is research to indicate that there may be several different subscales of impostor phenomenon based on the CIPS and other measures, future studies should further analyze not only the total scores but also the subscale scores of both community college and public four-year university students in their first and second year of study (Chrisman et al., 1995; French et al. 2008; Ibrahim et al. 2020). It would be interesting to discover if there are significant

differences between the groups on each of the subscales of the Clance based on college type and selected demographic variables.

More research should also be done on the relationship between impostorism and persistence. Although GPA was not found to be related to IP, more exploration should be done to investigate the contribution, if any, academic achievement makes to feeling like an impostor. By definition, impostor phenomenon involves an inability to internalize successes (Clance, 1985). Therefore, students with good grade point averages, which is an external indication of academic success, may still have significant feelings of impostorism. In addition, future exploration should analyze the relationship between IP and persistence and the predictive value of impostorism on student success and persistence to completion.

Because impostor phenomenon as a measurable theoretical construct seems to be ubiquitous in higher education, there should be more research into the culture of post-secondary education and how it contributes to feelings of phoniness. It would be interesting to uncover the aspects of higher education that cause students, regardless of institution type, to feel undeserving of their accomplishments leading to the inability to internalize and identify themselves by their successes. The lived experiences of college students should also be investigated and shared in an effort to better understand the role of the impostor phenomenon in academic careers.

Conclusion

The goal of this study was to look at impostor phenomenon in a group of students who have been largely omitted from the literature. Because there is an abundance of research about how impostorism affects students, community college students deserve to be included in the discourse and exploration of impostor phenomenon. The current research revealed community college students experience levels of impostorism similar to four-year public university students

in their first or second year of study. In addition, disabled students experience significantly higher levels of IP across all types of post-secondary institutions, and there are some noteworthy differences based on under-represented racial/ethnic minority status also. These findings are important because impostorism is related to and predictive of intent to persist in higher education.

Feelings of fraudulence and the psychological effects that accompany them can have seriously deleterious consequences for college students. Attending a community college does not release students from feeling like impostors and increasing access is not enough. The focus on student success has to include mental health services and social supports to help students deal with their feelings the consequences of them. In addition, special attention needs to be given to students with a diagnosed physical, behavioral, emotional, or learning disability. They are suffering the most, and the environments created by post-secondary institutions may be contributing to those feelings. Policy makers should review how disabled students are treated and expected to disclose their disability and what accommodations they need to be successful. For the students with a physical disability, the environment which includes campuses, classrooms, and meeting areas need to be welcoming and accessible to all students without causing fear or embarrassment.

As a community college faculty member, I have had several students tell me that they just do not feel like they belong in college. Their perception is not that community college is easier or less intense. They still feel like impostors, and increased access has not changed that. Similarly, as a mother of a college student with a diagnosed learning disability, I have seen his challenges first-hand. There is embarrassment at having to disclose his learning disability and the need to ask for accommodations is always humbling. Taking tests away from the class singles out

disabled students which can add to their feelings of impostorism. Finally, as a female, first-generation, graduate student of color, I have struggled with feelings of impostorism throughout my educational career. The experience of IP does not go away, but with awareness, support, and targeted interventions, it can be treated so that it does not impede the success of any student.

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Appendix A: Clance Impostor Phenomenon Scale

Clance IP 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)

Scoring the Impostor Test

The Impostor Test was developed to help individuals determine whether or not they have IP characteristics and, if so, to what extent they are suffering.

After taking the Impostor Test, add together the numbers of the responses to each statement. If the total score is 40 or less, the respondent has few Impostor characteristics; if the score is between 41 and 60, the respondent has moderate IP experiences; a score between 61 and 80 means the respondent frequently has Impostor feelings; and a score higher than 80 means the respondent often has intense IP experiences. The higher the score, the more frequently and seriously the Impostor Phenomenon interferes in a person's life.

Appendix B: Demographic Information Questions

For the next set of questions, please indicate which answer best describes you. Unless otherwise noted, one item should be selected for each question.

Q24 What is your gender identity?

- ○ Male (1)
- ○ Female (2)
- ○ Other (3)
- ○ I prefer not to respond (4)

Q25 What is your racial or ethnic identification? Please select only one.

- ☐ American Indian or Alaska Native (1)
- ☐ Asian (2)
- ☐ Black or African American (3)
- ☐ Hispanic or Latino (4)
- ☐ Native Hawaiian or Pacific Islander (5)
- ☐ White (6)
- ☐ Other (7)
- ☐ I prefer not to respond (8)

Q26 Have you been diagnosed with a learning, behavioral, emotional, or physical disability?

- ○ Yes (1)
- ○ No (2)
- ○ I am not sure (3)
- ○ I prefer not to respond (4)

Q27 How many course credit hours are you currently enrolled in?

- ○ 3-5 credit hours (1)
- ○ 6-8 credit hours (2)
- ○ 9-11 credit hours (3)
- ○ 12 or more credit hours (4)

Q28 Are you eligible for a Pell Grant? A Pell Grant is a type of financial aid the U.S. federal government gives to students who need it to pay for college. Federal Pell Grants are usually available to students with financial need, who have not earned their first bachelor's degree.

- ○ Yes (1)
- ○ No (2)
- ○ I am not sure (3)
- ○ I prefer not to respond (4)

Q29 Are you a first-generation college student. A first-generation college student is defined as a someone whose parent(s)/legal guardian(s) have not completed a college degree.

- ○ Yes (1)
- ○ No (2)
- ○ I prefer not to respond (3)

Q30 How likely is it that you will return to your current institution in the Fall of 2020?

- ○ Definitely Not going to return (1)
- ○ Not Likely to return (2)
- ○ I am not sure (3)
- ○ Likely to return (4)
- ○ Definitely going to return (5)

Q31 I am likely to remain in my current institution of higher education through graduation or completion of my program of study.

- ○ Definitely Not going to remain in my current institution through graduation (1)
- ○ Not Likely to remain in my current institution through graduation (2)
- ○ I am not sure (3)
- ○ Likely to remain in my current institution through graduation (4)
- ○ Definitely going to remain in my current institution graduation (5)

Q33 Which institution of higher education do you currently attend?

- ○ Thomas Nelson Community College (1)
- ○ Reynolds Community College (2)
- ○ John Tyler Community College (3)
- ○ Old Dominion University (4)

Q34 What is your current grade point average on a 4-point scale? Keep in mind that in general an A = 4.0, B= 3.0, C= 2.0, and a D= 1.0.

_____

Appendix C: Permission to Use Impostor Phenomenon Scale

To: Jenkins, Shanda J. <sjenkins@odu.edu>
Cc: Pauline Rose Clance <drpaulinerose@comcast.net>
Subject: Re: Clance Scale

Dear Shanda,

I work with and am replying to your Impostor Phenomenon (IP) request on behalf of Dr. Clance. Firstly, we hope you, your family, and friends are safe, healthy, hopeful, and proactive during the COVID 19 pandemic.

You have permission to use and make copies of the scale, *Clance Impostor Phenomenon Scale (CIPS)*, and I have attached it along with the scoring.

Please tell us a little more about your current research, such as how you plan to contact participants about the research and how you plan to transmit/administer the CIPS in order to ensure secure transmission. Below are some criteria:

Dr. Clance does not grant permission to distribute her CIPS to be made available to everyone on the world-wide web (internet email) via electronic survey. She gives permission to do so if: the population is clearly defined and only accessible to that population; if researchers use a secured computer program that only allows internet access to that clearly identified population, along with the researcher's ability to clearly identify (ISP address) those accessing the scale, with login controls, survey time-limit, and maintaining confidentiality. When all those requirements are met, having the copyright/permission to reproduce clause on each page of the scale via electronic survey is fine.

Also please read the permission form, included with the scale, and reply with your consent. We would greatly appreciate receiving a copy of your Dissertation for our records and will add the citation to the IP Reference List.

Given that you are using the CIPS, please use the terminology/title "Impostor Phenomenon" rather than Imposter Syndrome. See explanation below. Thank you.

FYI:

Given the official title of the scale (CIPS: Clance Impostor Phenomenon Scale) includes the words "Impostor Phenomenon," (IP) Dr. Clance suggests that researchers use that specific terminology (e.g., Impostor Phenomenon) rather than using "Imposter Syndrome," as that terminology (e.g., syndrome) refers to an official medical diagnosis, of which the IP is not [Kaplan, K. (May 20, 2009). Unmasking the impostor, *Nature, 459*, p. 2].

The preferred spelling is "Impostor" - with an "o" at the end rather than an "e."

Also, sometimes the word "syndrome" is seen in the social media rather than the word "phenomenon" - and use of the word "phenomenon" is the correct term to use when referencing the CIPS (Clance Impostor Phenomenon Scale) or Dr. Clance's work.

In regard to publication, we suggest that authors include both terms, Impostor Phenomenon and Imposter Syndrome, for "Key Word" searches.

I have further included an IP Reference list (not all inclusive) for your use and/or to make available for participants if they want to know more about the IP and you could refer them to Dr. Clance's website: <http://www.paulineroseclance.com>

FYI:

NEW RELEASE I have re-released my original 1985 *The Impostor Phenomenon: Overcoming the Fear That Haunts Your Success* book on Amazon Kindle for download to Reader: https://www.amazon.com/Impostor-Phenomenon-Overcoming-Haunts-Success-ebook/dp/B074D3NDGQ/ref=sr_1_1?s=digital-text&ie=UTF8&qid=1501621649&sr=1-1&keywords=the+impostor+phenomenon

There has been significant world-wide research and social media interest on the Impostor Phenomenon (IP), along with practical application of the Clance Impostor Phenomenon Scale (CIPS) since their inception in 1985.

The original book offers an in-depth background on the author's foundational conceptions of the IP, along with the IP Cycle, IP Profile, and exercises for those prone to experiencing IP feelings. Other IP articles by Dr. Clance may be viewed on her website: http://www.paulineroseclance.com/index.html

Requests for an updated Reference List on IP research and citations may be sent to Dr. Clance @ drpaulinerose@comcast.net

The book, inclusive of the Clance Impostor Phenomenon Scale, is copyrighted, so research/professional use and reproduction of the scale still requires permission by Dr. Clance: http://www.paulineroseclance.com/impostor_phenomenon.html

If you plan on submitting your research for publication, please first write again for permission conditions of the CIPS. Below are some criteria:

In regard to including the *Clance Impostor Phenomenon Scale (CIPS)* itself in a (journal) publication, permission is not given. There have been mixed legal issues with journal publishers who sometimes consider the CIPS as their property to freely disseminate when it is included in a publication, which does not protect Dr. Clance's copyright, required permissions by her to reproduce, and does not allow for reliable tracking/documentation of CIPS research/use. Dr. Clance does not charge for use of the scale to better enable persons to do research with publication without legal/financial complications. Many researchers use copyrighted scales for research and publish results, yet only properly cite a scale without including it, in its entirety, in a publication. Dr. Clance is highly supportive for persons to publish their results (we hope it works

out for you!) in reputable, accredited journals. If you do publish, please send us the citation and a copy of the work/link for our records. The proper citation for the CIPS is as follows:

Clance Impostor Phenomenon Scale (CIPS). 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. Use by permission of Dr. Pauline Rose Clance. Do not reproduce/copy/distribute without permission from Pauline Rose Clance, drpaulinerose@comcast.net, www.paulineroseclance.com.

Some authors have alternatively chosen to include an approved link to the CIPS from Dr. Clance's website in the Citations area of their work, which would also include the above original source citation, for which permission is given: Dr. Clance's website http://paulineroseclance.com and/or IP webpage (http://paulineroseclance.com/impostor_phenomenon.html - do *not* include CIPS PDF link directly).

Thank you for your interest in the Impostor Phenomenon and we wish you well with your work!

Sincerely,

Andra

Andra Gailis, M.S., NCC

Professional Counselor

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Roswell, GA 30076

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Appendix D: Consent Form

NOTE TO IRB: The consent will be given online using Qualtrics.

INFORMED CONSENT DOCUMENT

OLD DOMINION UNIVERSITY

PROJECT TITLE: A Comparison of Impostorism in Community College and Four-Year Public University Students

INTRODUCTION

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. This is a study of students' experiences of impostorism in college. If you agree to participate, you will complete this survey and a demographic questionnaire.

RESEARCHERS

Responsible Project Investigator: Mitchell Williams, Ph.D., Associate Professor, Darden College of Education and Professional Studies, Educational Foundation & Leadership

Investigators: Shanda Jenkins, M.S.

Assistant Professor, Thomas Nelson Community College,

Adjunct Instructor, Psychology Department Old Dominion University

Graduate Student, Darden College of Education and Professional Studies, Educational Foundations & Leadership

DESCRIPTION OF RESEARCH STUDY

We are evaluating college students' demographics, perceptions, grade point averages (GPA), and feelings of impostorism. If you decide to participate, then you will take part in a study involving research of college students' experience of the impostor syndrome. We are asking you to take part in a confidential survey of your perceptions and demographic information which will include your GPA. If you say YES, then you will be asked to respond to an online survey. Your participation will last for

approximately 5-10 minutes. All information will be kept private and will be used for research purposes only. Your name will not be asked to protect your confidentiality. If you say YES, then you are also consenting to accurately report your approximate GPA to the study investigators.

EXCLUSIONARY CRITERIA

The only criteria for completing this study are that you are a student registered for at least one class in college and that you are at least 18 years old or older. You are not eligible to participate in the study if you are younger than 18 years old or if you are a dual-enrollment student.

RISKS AND BENEFITS

RISKS: While there are no anticipated risks associated with completing the surveys. As with any research, there is always a small risk that confidential information (e.g., GPA) would be released if collecting demographic information. The researchers are taking several steps to minimize this

risk as much as possible. See the CONFIDENTIALITY section below for the steps the researchers will take to keep your information private.

BENEFITS: There are no direct benefits to you for participating in this study. However, your participation may contribute to our understanding of factors that affect students' achievement in science courses. Extra credit may also be offered at the discretion of your instructor. You can also be included in a drawing to win a gift card for your participation.

COSTS AND PAYMENTS

You must complete each survey by the designated deadline to earn any course credit or to be entered in a drawing to win a gift certificate.

NEW INFORMATION

If the researchers find new information during this study that would reasonably change your decision about participating, then they will give it to you.

CONFIDENTIALITY

The researchers will take several steps to keep your private information confidential (such as questionnaire responses and GPA). The researchers will not collect

identifying information from the survey. The researchers will store any electronic data with identifying information on password-protected Old Dominion University's secure servers. Only members of the research team will have access to your survey responses and your instructor will not be able to access your survey responses. The results of this study may be used in research reports, presentations, and publications, but the researchers will not identify you. Of course, your records may be subpoenaed by court order or inspected by government bodies with oversight authority.

WITHDRAWAL PRIVILEGE

It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and withdraw from the study at any time. Your decision will not affect your relationship with your college, Old Dominion University, your grade in any course, or otherwise cause a loss of benefits to which you might otherwise be entitled.

COMPENSATION FOR ILLNESS AND INJURY

If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of harm arising from this study, neither your College, Old Dominion University, nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer harm as a result of participation in any research project, you may contact Dr. Mitchell Williams the responsible project investigator at 757-683-6939, Dr. Laura Chezan, the current chair of the Darden College of Education and Professional Studies Human Subjects Review Committee at 757-683-7055 or lchezan@odu.edu, or the Old Dominion University Office of Research at 757-683-3460 who will be glad to review the matter with you.

VOLUNTARY CONSENT

By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research

study, and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers should be able to answer them: Contact: Dr. Mitchell Williams at 757-683-6939

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr. Laura Chezan, the current chair for the Darden College of Education and Professional Studies Human Subjects

Committee, at 757-683-7055 or lchezan@odu.edu, or the Old Dominion University Office of Research, at 757-683-3460.

And importantly, by typing your name and clicking the next button below, you are telling the researcher YES, that you agree to participate in this study, and that you are least 18 years old. Please print a copy of this form for your records.

Subject's Name:_____

Appendix E: Approval Letters to Conduct Research

OLD DOMINION UNIVERSITY

OFFICE OF THE VICE PRESIDENT FOR RESEARCH

aalac INTERNATIONAL
PROUDLY, AN AALAC ACCREDITED PROGRAM

Physical Address
4111 Monarch Way, Suite 203
Norfolk, Virginia 23508
Mailing Address
Office of Research
1 Old Dominion University
Norfolk, Virginia 23529
Phone(757) 683-3460
Fax(757) 683-5902

DATE:	January 24, 2020
TO:	Mitchell Williams
FROM:	Old Dominion University Education Human Subjects Review Committee
PROJECT TITLE:	[1550739-1] A Comparison of Impostorism in Community College and Four-Year Public University Students
REFERENCE #:	
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	January 24, 2020
REVIEW CATEGORY:	Exemption category # *2*

Thank you for your submission of New Project materials for this project. The Old Dominion University Education Human Subjects Review Committee has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Laura Chezan at (757) 683-7055 or lchezan@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old Dominion University Education Human Subjects Review Committee's records.

Reynolds
COMMUNITY COLLEGE

Request to Conduct Research at J. Sargeant Reynolds Community College

Name of Requestor:	Shanda Jenkins and Dr. Mitchell Williams
Organization:	Old Dominion University
Title of Research Project:	A Comparison of Impostorism in Community College and Four-Year Public University Students

Brief Purpose of the Study:

The purpose of this study is to examine impostorism among Virginian community college students and similar students who are in their first or second year at four-year public universities. Using the Clance Impostor Phenomenon Scale (CIPS), this non-experimental quantitative study will compare impostorism scores for community college students to the scores of first- and second-year public four-year university students. Additionally, the study will explore whether variables such as race/ethnicity, first generation status, Pell Grant eligibility, and disability status affect the CIPS scores of community college students. In a time when enrollment in higher education is declining, and persistence to completion is the objective, it is imperative to consider any and all factors that can affect admission, continuation, and graduation. In the literature, impostorism has been associated with several personality, psychological, and behavioral outcomes that may affect student success. It is essential to examine the rates of impostorism in community college and public four-year institutions to see which students have the highest levels of impostorism and to determine how they can be best served at both types of institutions. This study will offer some insight into the feelings of impostorism in college students. The literature has indicated impostor phenomenon has the potential to negatively impact student performance and overall well-being. However, the majority of this research has been with students in four-year intuitions and there is very little research with students enrolled in community colleges, leaving a gap in our knowledge. This study adds to the literature by exploring impostor phenomenon in a population of students that has been largely overlooked. Better understanding of impostorism in the college student population could be beneficial in creating more inclusive environments with targeted interventions for students who are in jeopardy.

Submit with this form with a brief proposal detailing the methodology to be used, manner of obtaining consent from subjects, resources needed, and expected outcomes/benefits of the study. Also include documentation of approval from the Institutional Research Board (IRB) of your sponsoring institution/organization.

I agree to the following terms and conditions:

- Class time will not be used for any research activities, unless participation in the research is both educationally valuable and a natural part of the course content. If use of class time is requested, the

Reynolds
COMMUNITY COLLEGE

researcher in consultation with the AVP of SPIE, will secure the approval of the appropriate faculty member(s) before proceeding.

- All research will be conducted to the highest ethical standards. Reynolds students, faculty, and staff participating in research must be fully informed as to the purpose of the research, risks and benefits, and what participation will entail; give their consent to participate; and be free to withdraw from the research at any time.
- Reynolds, its students, faculty, and staff involved as subjects in research will not be identified when findings are presented or published.
- The researcher agrees to provide documentation of subjects' consent to the Office of the AVP of SPIE in a mutually agreeable format.
- The researcher agrees to inform the college when the research is complete and to provide a copy of the results of the study. A summary of the results may be made public by the college.

Signature of Requestor: _____ Date: 1/28/2020

Approved by: _____ Date: 02-26-2020

Denied by: _____ Date: _____

Reason for Denial:

March 6, 2020

Ms. Shanda Jenkins
99 Thomas Nelson Drive
Hampton, VA 23666

Dear Ms. Jenkins:

Thank you for submitting your request to conduct research at John Tyler Community College (Tyler). After careful review, the Tyler Internal Review Board (IRB) has decided to approve your research request. Please email your updated link and any questions you have to me at kpettengill@jtcc.edu.

I wish you the very best as you complete your research studies. The College is looking forward to receiving a copy of your final report.

Sincerely,

Keri-Beth Pettengill, M.S., Ed.D.
Director, Office of Institutional Effectiveness

www.jtcc.edu
804.594-1577
800.552.3490
TDD: 804.796.4197

Chester Campus
13101 Jefferson Davis Highway
Chester, VA 23831-5316

Midlothian Campus
800 Charter Colony Parkway
Midlothian, VA 23114-4383

THOMAS NELSON

The Peninsula's Community College

April 24, 2019

Ms. Shanda Jenkins
Old Dominion University
Doctoral Candidate

Dear Ms. Jenkins,

The Office of Institutional Research and Effectiveness at Thomas Nelson Community College has reviewed your request to survey the College's students and contact its faculty for recruitment assistance as part of your research project entitled *Imposter Phenomenon in Community College Students*. Based on that review, and your subsequent submission of IRB exemption paperwork from Old Dominion University, the College has granted approval for this research.

Please note that all research activities must be carried out in accordance with the documentation you submitted and in adherence to our Thomas Nelson Principles of Practice.

If you have any questions or concerns regarding the contents of this letter, please let me know. I wish you the best in your research.

Sincerely,

Steven Felker
Director of Institutional Research and Effectiveness

Appendix F: Recruitment Emails to Students

Dear Student,

Shanda Jenkins, a PhD student in the College of Education at Old Dominion University, is conducting a survey to study your feelings about your college experience. The survey will take approximately 5 minutes to complete.

If you choose to participate in the survey, your survey responses will be kept confidential. We will not collect any identifying information and no one but the researchers will see your responses. We will NOT share your response with your course instructor.

Please go to this link [insert Qualtrics survey link here] if you would like to participate in the

survey. Please note that your participation is voluntary and is not related to your class or your class grade in any way.

You will first be asked to read and complete a consent form. Please read the form carefully, then print it for your records. After completing the consent, you will be taken to the short survey.

You have until May 15, 2020 to complete this survey. We will close the survey once this deadline passes.

Please contact me if you have any questions or concerns at sjenkins@odu.edu or by phone at 757-827-3599.

Sincerely,

Shanda Jenkins, M.S.

Assistant Professor of Psychology

Thomas Nelson Community College

Student Old Dominion University

Appendix G: Tables of Imputed Data in R

Table 31

ANOVA Results of Imputed Community College Data for Students with a Disability in R

Imputation	df	Sum Sq	*F*	*p*
Original Data	1	2117	15.05	<0.01
1	1	12177	57.40	<0.01
2	1	9758	44.23	<0.01
3	1	8557	38.10	<0.01
4	1	10701	49.16	<.001
5	1	11662	53.13	<0.01

Note. *N* for Original data = 288; *N* for imputed data = 495

Table 32

ANOVA Results of Imputed Community College Data for URM Students in R

Imputation	df	Sum Sq	*F*	*p*
Original Data		14.62	0.07	<0.01
1		2396	11.29	<0.01
2		1666	7.55	<0.01
3		3651	16.26	<0.01
4		3617	16.61	<0.01
5		1873	8.53	<0.01

Note. *N* for Original data = 288; *N* for imputed data= 495

Table 33

ANOVA Results of Imputed Data for All Students with a Disability in R

Imputation	df	Sum Sq	*F*	*p*
Original Data	1	5592.60	12.40	<0.01
1	1	15184	21.88	<0.01
2	1	13623	22.03	<0.01
3	1	18345	29.84	<0.01
4	1	12951	25.18	<0.01
5	1	19412	27.70	<0.01

Note. *N* for Original data = 408; *N* for imputed data = 723

Table 34

ANOVA Results of Imputed Data for All Students with a Disability in R

Imputation	df	Sum Sq	*F*	*p*
Original Data	1	5592.60	25.48	<0.01
1	1	3371	14.93	<0.01
2	1	3402	14.80	<0.01
3	1	6766	30.35	<0.01
4	1	7240	33.13	<0.01
5	1	8884	29.90	<0.01

Note. *N* for Original data = 408; *N* for imputed data = 771

VITA

Shanda Jeanette Jenkins

222 Cherry Avenue
Hampton, VA 23661
(757) 472-4432
valsgirl1952@gmail.com

PROFESSIONAL EXPERIENCE:

Psychology Department Chair, Thomas Nelson Community College, August 2016- present
Assistant Professor, Thomas Nelson Community College, August 2015- present
Adjunct Instructor, Thomas Nelson Community College, August 2004- August 2015
Adjunct Instructor, Old Dominion University, August 2004- present
Adjunct Instructor, Norfolk State University, August 2006- May 2013
Registered Polysomnographic Technologist, Sentara Hospitals, May 2000 – Present
Research Assistant, Old Dominion University, August 1999 – May 2000
University 100 Class Instructor Radford University, August 1996 – December 1996

PRESENTATIONS:

Jenkins, S. (1999, May). *The help-seeking behavior of minority college students*. Paper presented at the meeting of the Virginia Academy of Science, Norfolk, VA.

Jenkins, S. (2017, January). *Teaching African American students.* Presentation for the Thomas Nelson Community College Colloquium. Hampton, VA.

Jenkins, S. (2017, March). *Teaching African American students.* Presentation for Tidewater Community College Faculty and Staff. Norfolk, VA.

Jenkins, S. (2017, January). *Teaching African American students.* Presentation for New Horizons for the Virginia Community College System. Roanoke, VA.

Jenkins, S. (2017, January). *Teaching African American students workshop.* Presentation for the Regional Center for Teaching Excellence. Hampton, VA.

Jenkins, S., & Soulsby, L. (2018). *Financial equity for Historically Black Colleges and Universities*. Paper presented at the Old Dominion University Graduate Research Colloquium.

Jenkins, S. J. & Perez, T. (2020, Apr 17 - 21) *An examination of impostor phenomenon in community college students* [Paper Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/wfm68v4 (Conference Canceled)

Jenkins, S., Soulsby, L., Taylor, S. *Widening student participation in higher education.* Presentation for the Conference on Social Mobility and the Future of Higher Education at Anglia Ruskin University in Cambridge, UK.

PUBLICATION:

Samuels, K., Estes, M., Eckman, H., Gillerlain, K., Jenkins, S., Miller-Edwards, W., Reinauer, O., & Walker, N. (2019). Blending credit & non-credit courses: Best practices, opportunities, barriers. *Inquiry: The Journal of the Virginia Community Colleges, 22* (1). Retrieved from https://commons.vccs.edu/inquiry/vol22/iss1/6