

Undergraduate Imposter Syndrome Rates Between Gender and Field of Study

Brianna A. Beesley, Nicholas G. Vece, and Zoe Johnson-Ulrich
Department of Psychology, Eastern Oregon University

ABSTRACT. Imposter syndrome is a psychological phenomenon in which an individual feels that their accomplishments or successes were not achieved by merit but instead achieved through chance or luck. This study investigated the relationship between imposter syndrome and field of study, focusing on differences between STEM and non-STEM undergraduate students, as well as differences in imposter syndrome prevalence among genders. One hundred eighty participants took part in this study via an online survey. Participants were asked to complete a demographic questionnaire and a 30-item questionnaire, which included the Clance IP Scale. We hypothesized that there would be higher levels of imposter syndrome among STEM majors compared to non-STEM majors, that undergraduate women would report higher levels of imposter syndrome compared to undergraduate men, and that women within STEM majors would report the highest overall level of imposter syndrome among the samples. As hypothesized, STEM majors reported significantly higher imposter syndrome than non-STEM, $F(1,180) = 6.13$, $p = .01$, $\eta^2 = .03$, and women reported significantly higher imposter syndrome levels than men, $F(1,180) = 4.51$, $p = .04$, $\eta^2 = .02$. Accordingly, female STEM majors had the highest levels of imposter syndrome ($M = 63.98$, 95% CI [60.89, 67.07]). This study is one of the first to investigate and find a significant difference between STEM and non-STEM participants and find a presence of imposter syndrome within the male non-STEM population, thus opening the door to a multitude of further research directions.

Keywords: imposter syndrome, STEM, non-STEM, undergraduate, gender differences



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Imposter syndrome (also referred to as the imposter phenomenon) was first studied in high-achieving women in both corporate and academic environments (Clance & Imes, 1978) and has since been studied across a wide range of social environments. The first article regarding imposter syndrome was written by Clance and Imes (1978) and included interviews from women regarding their experiences with imposter syndrome. Clance and Imes found that the most common feeling experienced by those with some form

of imposter syndrome was that they were undeserving of accomplishments and successes despite the proficiency they had shown within that given area. Individuals with imposter syndrome also feel that they have simply “fooled” everyone around them into believing they are as intelligent as their peers and attribute all their success to luck. These feelings are often unfounded, and the individual rationalizes additional instances of success as further proof of their deception. The feelings created by imposter syndrome are not often disclosed to others, as

the individual believes that just mentioning their feelings could cause others to see through their facade, and the secretive nature of the feelings can cause considerable lasting anxiety (Clance & Imes, 1978).

Despite the discomfort created by feelings of imposter syndrome, it is currently not recognized as a psychological disorder by the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) or the ICD-11 (International Classification of Diseases), and thus, no official clinical interventions or standardized diagnostic tools currently exist. Despite the lack of official diagnosis, the work of Clance and Imes (1978) has inspired other studies regarding imposter syndrome to be conducted, and several scales have since been developed to measure it (Mak et al., 2019). Continued research on imposter syndrome may help others recognize imposter syndrome as a neglected disorder that impacts the lives of many people.

Since the original article published by Clance and Imes (1978), further research has been conducted to investigate the extent to which gender differences exist in the rates of imposter syndrome today. One such study reporting a significant gender effect was conducted by Cusack and colleagues (2013). In this study, 506 undergraduate students were recruited from various universities and asked to complete an online survey containing several questionnaires including the Clance IP (Imposter Phenomenon) Scale (Clance, 1985), the General Health Questionnaire (Goldberg, 1972), the Child and Adolescent Perfectionism Scale (Flett et al., 1997), the Rosenberg Self-Esteem Scale (Rosenberg, 1965), and finally the Test-Anxiety Scale (Taylor & Deane, 2002). The study showed that women reported significantly higher levels of imposter symptoms than men. Furthermore, higher rates of imposter syndrome were also positively correlated with perfectionism, test anxiety, and lower overall mental health (Cusack et al., 2013). Cusack et al. believed that this gender effect was due to the greater number of roles women have placed on them (e.g., mother, wife, employee) compared to men and the expectations of success that are placed on women within all of these roles. Overall, research has shown that imposter syndrome is more prevalent in women in high-achieving roles and academic environments (Clance & Imes, 1978; Cusack et al., 2013). However, it should be addressed that, although imposter syndrome levels in this study were higher in women, the actual scores for the men were not presented by Cusack et al. (2013), so it is unclear whether the men were also experiencing imposter syndrome to a measurable degree.

This study by Cusack et al. (2013) was one of several focused on studying imposter syndrome within a population prone to experiencing higher than average amounts of stress and anxiety: university students

(Gardner et al., 2019; Qureshi et al., 2017; Roets, 1991; Wang et al., 2019). Within university student populations, research has specifically focused on college STEM (science, technology, engineering, and math) students, or students of other traditionally educationally intensive programs such as law (Gardner et al., 2019; Qureshi et al., 2017; Wang et al., 2019). Although all subjects have their own individual stressors, especially at the collegiate level, STEM majors tend to be regarded as more difficult due to their academic demands. A high prevalence of imposter syndrome with STEM majors can be seen in a study by Qureshi et al. (2017). This study examined medical students during their last year of education. Participants completed an eight-question self-report assessment based on the Young Imposter Scale (Villwock et al., 2016). Results from the assessments found that, out of almost 150 students, nearly half (47.5%) were experiencing some level of imposter syndrome. One possible explanation presented by Qureshi et al. (2017) for the rate of imposter syndrome displayed was that the medical field is very demanding, as dealing with preserving the lives of others can be very challenging and has little margin for error.

Another study that focused on imposter syndrome within STEM and other traditionally difficult fields was conducted by Wang and colleagues (2019). The participants of Wang et al.'s research study were composed of students studying economics, program engineering, law, and other STEM fields. The participants of Wang et al. (2019) completed several questionnaires including the Clance IP Scale, the Short Almost Perfect Scale (Slaney et al., 2001), the Depression Anxiety Stress Scale-21 (Lovibond & Lovibond, 1995), and the Self-Concept Scale (Singelis, 1994). In addition to their results on the mediating link of imposter syndrome between anxiety and perfectionism, they also found that, on average, participants were experiencing at least moderate feelings of imposter syndrome regardless of their major, as assessed by the Clance IP Scale. Even though both studies highlight the prevalence of imposter syndrome among undergraduate students, a major limitation of this research is their focus on predominantly STEM fields only.

Although differences in imposter syndrome ratings between STEM and non-STEM majors have not yet been established, there have been measurable differences between the two fields in other areas regarding mental health. One such study by May and Casazza (2012) analyzed the differences in individuals' self-perceived stress between more loosely defined "hard sciences" (biology, mathematics, chemistry, nursing) and "soft sciences" (history, language, arts); with the traits of hard sciences similar to those associated with STEM

SUMMER 2024

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

fields, and the traits of soft sciences similar to non-STEM fields. Participants in this study took surveys containing the Perceived Stress Scale (Cohen et al., 1983) and the Personal Views Survey III-R (Maddi & Khoshaba, 2001), two questionnaires measuring an individual's perceived stress levels and psychological hardiness, respectively. The authors found that students of hard sciences experienced significantly more perceived stress than those studying soft sciences, even when other non-education-based stressors (e.g., finances, relationships) were controlled for within the data. In conjunction, the higher levels of stress and anxiety experienced by students of more difficult fields of study (May & Casazza, 2012) may be associated with higher rates of imposter syndrome (Cusack et al., 2013; Wang et al., 2019).

With the previous literature in mind, it is clear that there is more to investigate regarding imposter syndrome. In addition, there are limitations to the current literature that result in uncertainties regarding the generalizability of imposter syndrome research findings and implications. In general, research regarding imposter syndrome has been focused within higher education on specific majors or STEM fields (Qureshi et al., 2017; Roets, 1991; Wang et al., 2019). This means that, although the rates of student imposter syndrome within specific fields of upper education have been measured, the results cannot be generalized across all college students. As a result, overall differences between different student populations, such as various academic majors, have not been sufficiently measured. Therefore, it is currently impossible to tell whether imposter syndrome rates are higher amongst a specific population of students, or whether these imposter experiences are simply a normal part of modern culture. Building off current research and its limitations, our present study investigated the possible differences between gender and STEM and non-STEM students.

We explored three hypotheses within this study. We hypothesized that there would be a higher level of self-reported imposter syndrome among participants who are STEM majors compared to participants in non-STEM majors. Furthermore, as the experiences of women and the study of gender differences in imposter syndrome have been prevalent throughout the literature (Clance & Imes, 1978; Cusack et al., 2013), we also hypothesized that undergraduate women would report more pronounced levels of imposter syndrome compared to undergraduate men. Lastly, we hypothesized that, based on our previous hypotheses, women within STEM majors would report the highest overall level of imposter syndrome.

We administered a demographic questionnaire to undergraduate STEM and non-STEM majors followed by the Clance IP Scale (Clance, 1985). Through these questionnaires, imposter syndrome levels were assessed

in both areas of study (STEM and non-STEM), and comparisons between areas of study and gender were evaluated. In this study, the predictor variables are the major of the undergraduate participant (STEM or non-STEM) and their gender (male or female). Our outcome variable of this study is the severity of imposter syndrome experiences present in the participants as measured by the Clance IP Scale.

Method

Participants

Participants were undergraduate students enrolled during the 2022–2023 academic year. The study was advertised by professors via email, by the research team via in-class recruitment presentations, and through the University Infoline: a campus-wide weekly newsletter emailed to all students. As compensation for their participation, some professors provided extra credit to their participating students. Our sample consisted of 220 participants; however, due to either failed consistency or deception checks or double major status, only 180 were included in the analysis. The final sample used in analysis was made up of male non-STEM majors ($n = 20$), female non-STEM majors ($n = 44$), male STEM majors ($n = 34$), and female STEM majors ($n = 82$). Individuals who identified with a gender other than male or female ($n = 5$) or indicated that they were pursuing more than one major ($n = 15$) were not included in these analyses due to the extremely small size of those samples. Individuals who received a score under the lowest possible score from the personality portion of the study were also excluded from the analysis ($n = 20$) as this indicated that they did not complete the survey.

Although we were able to report the gender and major of participants, we are unable to report other demographic characteristics, like the participant's race/ethnicity, major, age, and year in school, due to lost data from a change in survey software. We recognize that this lack of information inhibits the generalizability of results; however, we believe that despite the missing characteristics, our research and its findings are advantageous for the field of psychology, educational systems, and counseling services, to have access to and be aware of.

Materials

For our imposter syndrome scale, we used the Clance IP Scale (Clance, 1985) due to its reliability and prevalence throughout the current literature (Cusack et al., 2013; Holmes et al., 2010; Mak et al., 2019; Wang et al., 2019). This scale includes 20 vignettes regarding feelings of imposter syndrome. Participants were asked to report how true they felt the vignettes related to their thoughts on a scale from 1 (*not at all*) to 5 (*very true*). Level of

imposter syndrome is calculated by summing a participant's responses, such that a high score indicates high levels of imposter syndrome, and a low score indicates low levels of imposter syndrome. Clance and Imes (1985) categorized scores into intensity and frequency categories, which include few (40 or less), moderate (41–60), frequent (61–80), and intense (80 or above). We chose this scale because it has been found the most favorable and widely utilized compared to the Harvey Imposter Scale, the Perceived Fraudulence Scale, and the Leary Imposter Scale (Mak et al., 2019) and found to be more sensitive, accurate, and consistent in detecting imposter syndrome when compared just to the Harvey Imposter Scale (Holmes et al., 2010).

To mask the focus on imposter syndrome and serve as a participant response quality check, we also utilized 10 questions from the International Personality Item Pool (Goldberg, 2022), which is commonly used to assess the Big Five Personality Markers. The questions chosen measured two specific personality traits: extraversion and agreeableness, with five questions dedicated to each trait. We decided to use the extraversion and agreeableness questions from the 10 International Personality Item Pool questions (Goldberg, 2022) because those questions' wording and content are similar to the Clance IP Scales' and they are both scored on 1 through 5 scales, allowing us to obscure the true objective of the study. These personality trait questions served as a consistency check as they easily flagged participants who answered unreliably and allowed us to remove participants from the data to ensure the quality of obtained responses. For example, an individual who indicates that they enjoy attention and also do not enjoy drawing attention themselves are likely not fully reading each question and thus their data would be removed.

A demographic assessment containing seven questions regarding age, gender, race, ethnicity, college major, and academic year was also administered to participants; we had no plan to analyze demographic variables other than gender but it may turn out that some are relevant to imposter syndrome and so the information was collected for potential future use. In addition, we wanted to obscure our true purpose such that participants would not guess that we were specifically interested in gender.

Design

This study utilized a 2 x 2 between-subjects design. The predictor variables of this research study were the difference in university majors of the undergraduate participants (STEM or non-STEM) and gender (male or female). The distinction between STEM and non-STEM majors was decided by the university's colleges and schools of study. The college of science, technology,

mathematics, and health sciences (STMHS) was considered STEM and non-STMHS colleges were considered non-STEM. For this study, biology, nursing, chemistry, biochemistry, psychology, computer science, cybersecurity, data analytics, health and human performance, mathematics, and sustainable rural systems were all considered STEM majors. Any other major outside of this list was considered non-STEM. The outcome variable was between subjects and was the severity of imposter syndrome experiences present in the participants assessed via the Clance IP Scale (Clance, 1985).

Procedure

The study was distributed to participants after it was approved by the institutional review board (protocol number 2022-03). Undergraduate participants completed this study remotely from January to February of 2023. The study was presented to participants through the online survey software Qualtrics, and participants accessed the study through a shareable link.

All participants read and signed an informed consent form online before they began the study. The consent form described the study as an assessment of personality differences between fields of study. Participants who did consent were presented with a URL link and asked to copy and paste the URL link into their web browser to complete the study. Due to this extra step, a small number of participants only completed the informed consent and did not continue with the study URL. However, this was a very small number and did not affect the collected data.

The first segment of the study asked participants to input their demographic information. After completing the demographic segment of the study, participants were then informed that they were going to begin the personality trait segment of the study (Beesley & Vece, 2023). Participants were then presented with a 30-item questionnaire composed of 20 vignettes from the Clance IP Scale (Clance, 1985) and 10 questions from the International Personality Item Pool (Goldberg, 2022), all of which were presented in a random order. After participants completed their responses to the vignettes, they were presented with a deception check. This check asked participants what they thought the purpose of the study was. Participants could either fill in a text box with their answer or select a box marked "I have no idea". This was to ensure that the true purpose of the study was obscured and participants were not acting due to any participant bias. Ultimately, no participants were removed based on their responses to the deception check.

After the deception check, the study ended, and participants were thanked for their participation and debriefed. The debriefing form informed participants

SUMMER 2024

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

that the true purpose of the study was to investigate imposter syndrome rates both between STEM and non-STEM majors and among genders. Participants were reminded that their responses were completely anonymous. After reading the debriefing, participants then received a prompt that included an extra credit code that they could send to the researchers.

Data Analysis

For this study, a 2 x 2 between-subjects analysis of variance (ANOVA) was performed to determine significant mean differences within our sample. The main effects of gender and major, as well as interaction effects, were measured.

Results

All assumptions of the ANOVA were met as assessed with a Levene's Test for Equality of Variances ($p = .43$), and a Shapiro-Wilk Test for Normalcy was used to test the STEM ($W = .96$, $p = .10$), non-STEM ($W = .98$, $p = .33$), female ($W = .97$, $p = .22$), and male ($W = .98$, $p = .47$) samples separately. The combined Clance IP Scale and personality scale was found to be very reliable when analyzed using Cronbach's Alpha ($\alpha = .86$). We found a significant main effect of college major, $F(1,180) = 6.13$, $p = .01$, $\eta^2 = .03$ (see Figure 1). As hypothesized, individuals in STEM majors ($M = 62.75$, $SD = 14.63$) experienced significantly higher rates of imposter syndrome when compared to non-STEM majors ($M = 56.56$, $SD = 13.15$). An additional significant main effect was also detected regarding gender, $F(1,180) = 4.51$, $p = .04$, $\eta^2 = .02$ (see Figure 1). In this case, participants who identified as female ($M = 62.25$, $SD = 14.29$) experienced significantly higher rates of imposter syndrome when compared to participants

who identified as male ($M = 56.98$, $SD = 14.44$), which confirmed our secondary hypothesis. No significant difference or interaction effects were identified between the gender and college major conditions, $F(3, 180) = 0.02$, $p = .747$, $\eta^2 = .00$. Imposter syndrome severity scores were also grouped into categories including few (40 or less), moderate (41–60), frequent (61–80), and intense (80 or above) as per the Clance IP Scale scoring rubric (Clance, 1985).

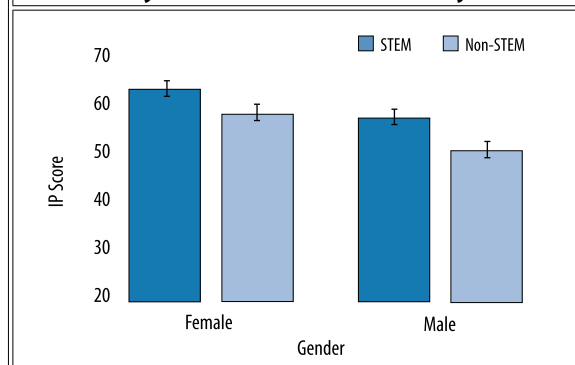
Discussion

Our first two hypotheses were confirmed; there was a significant difference in imposter syndrome rates between the majors, with STEM majors reporting significantly higher imposter syndrome than non-STEM. Additionally, there was a significant difference in imposter syndrome scores between men and women gender, with women reporting significantly higher imposter syndrome levels than men. Finally, we confirmed our third hypothesis, as female STEM majors had significantly higher levels of imposter syndrome when compared to all other conditions. Our study was the first, to our knowledge, to show that STEM majors not only have high levels of imposter syndrome, but that these levels are higher than non-STEM majors. Future efforts should aim at analyzing the majors separately, if possible, to determine whether there are specific STEM or non-STEM majors which are more prone to developing imposter syndrome.

These results also lend support to a positive relationship between high stress fields of study and imposter syndrome rates. More difficult fields of study are associated with greater levels of mental health disorders like anxiety (May & Casazza, 2012). This finding may indicate that the elevated academic anxieties of an individual in a STEM field may also lead to greater feelings of imposter syndrome. However, our results still demonstrated a moderate level of imposter syndrome feelings within non-STEM majors, something that has not been presented in the existing literature. One possible explanation for these results is that the non-STEM student sample was primarily made up of women, which is a population that has been previously associated with higher rates of imposter syndrome (Clance & Imes, 1978; Cusack et al., 2013). However, the male non-STEM participants still exhibited a moderate level of imposter syndrome. Another possible explanation for these elevated levels among non-STEM students is that the imposter syndrome may originate from general academic stressors, or even stressors outside of academics. During the interviews conducted by Gardener et al. (2019), some participants reported that their imposter feelings tend to appear in specific contexts where they believe they appear to be an imposter. This could be

FIGURE 1

Imposter Syndrome Severity Score by Gender and Field of Study



Note. Means scores are shown for the Imposter Syndrome Severity Scores between females and males in STEM and non-STEM fields of study. Error bars represent standard error.

SUMMER 2024

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

regarding their academic ability, race/ethnicity, or status as a first generation student (Bravata et al., 2020). Cusack et al. (2013) observed that individuals who experience more issues regarding anxiety and mental health also experience more imposter syndrome. This could account for some of the imposter syndrome frequency seen in non-STEM students, as both STEM and non-STEM students may undergo similar educational pressures and general life stressors.

The significantly higher rate of imposter syndrome in women compared to men within our results are consistent with the claims of Clance and Imes's (1978) original article on imposter syndrome, as well as the results of Cusack et al. (2013). As referenced by Clance and Imes (1978), women have various gender expectations and roles placed on them at a young age, encouraging imposter syndrome to develop. On top of that, women in STEM are less prevalent in STEM (NCSES, 2023) possibly due to factors such as gender stereotypes, a lack of female role models to encourage participation in STEM fields, and the fact that STEM fields and workplaces are typically male-dominated and exclusionary of women (Davis & Hill, 2018), which can play a role in a higher rate of imposter syndrome within women in STEM.

With considerations to the gender roles placed on girls at a young age, as well as the gender disparities seen within STEM fields and workplaces, our study's results corroborate Cusack et al. (2013) and Clance and Imes's (1978) explanations for how traditional gender expectations and workplace demographics influence imposter syndrome rates within women. However, it is important to note the age of these articles, and that gender roles have likely changed since the publishing of both Clance and Imes (1978) and Cusack et al. (2013). Although some do still exist regarding the roles of women and men, general understandings of gender roles have shifted considerably towards a more neutral outlook in the past few decades (Charlesworth & Banaji, 2021). This does indicate that gender stereotypes are not as strong now as they were before; however, Charlesworth and Banaji (2021) did note that they continue to exist and men are still seen as career-focused while women are seen as family-focused.

Additionally, our results did demonstrate that, on average, men reported a moderate level of imposter syndrome. In this aspect, our findings were consistent with that of Qureshi et al. (2017), because although it is true that men reported less imposter syndrome than women, the imposter syndrome that men experienced was still considerable. As most imposter syndrome research has focused on imposter syndrome prevalence among women, our results demonstrate that high imposter syndrome rates are not limited to the women and that

men suffer from this psychological phenomenon as well. Further research should explore possible relationships between childhood experiences, gender roles, and more in men who experience imposter syndrome.

Several limitations to the present study should be addressed. One major limitation is a lack of demographic data. Because this study's demographic data was not saved and reported, there is a large limitation on the generalizability of the results as other factors such as ethnicity or age could be mediating factors in the development or severity of imposter syndrome. Further research should explore some of these factors within college populations as any number of these factors may influence imposter syndrome presentation in a number of ways unaccounted for here. However, some general demographic information of the student population was made available through the university, indicating that the campus population at the time of data collection was predominantly made up of students identifying as White (67%) followed by students identifying as Hispanic (14%). Non-first-generation students were also a majority of the population, with first-generation students only accounting for 33% of the student population (Eastern Oregon University, 2023). Although these numbers might not be reflected in our sample, we believe they can provide a general idea of what our sample might have looked like.

There should also be considerations toward the university in which we conducted our study. Because our participant pool was composed of students from a small, rural, public university, our student population may display a different rate of imposter syndrome than other universities' student populations. Our participants were also mainly composed of women and STEM majors. This means that differences in imposter syndrome measured among genders and majors may have been more pronounced if we had obtained greater statistical power. Another demographic limitation of our study was the lack of participants who identified as nonbinary. Due to this exclusion, the results we obtained may not be fully generalizable across all college students.

One last limitation to be addressed regarding the design of this study was the choice of imposter syndrome scale used. We chose to use the Clance IP Scale (Clance, 1985) because it was both the most widely used tool for imposter syndrome measurement and the most validated (Holmes et al., 1993; Mak et al., 2015). However, because there is no current standard for imposter syndrome measurement, our data may be less valid should a more effective scale be created.

We believe that, based on the results obtained by this study, continued research in this area is warranted. This research should move its focus to other types of universities, such as private universities, universities

in urban areas, and universities with larger student bodies. Additionally, this study was not able to include individuals pursuing multiple majors or those who self-identify as nonbinary, due to both samples not containing enough members to allow for any analysis. Further research should investigate these groups to determine whether any differences exist within them.

In addition to these demographics, there are others such as race/ethnicity and family history that further studies should look at as predictors of imposter syndrome. Bravata et al. (2020) briefly addressed this in a meta-analysis and found that marginalized groups experienced more imposter syndrome, but we believe that there is space in the current literature for this topic. Additionally, an individual's family background may play a role in imposter syndrome development, as first-generation college students may experience higher academic pressures than other students. Further research between STEM and non-STEM groups could address students' family backgrounds as a mediating factor between chosen major and imposter syndrome so that more meaningful direct comparisons can be made.

Lastly, as there was a prevalence of imposter syndrome among the men in our study, the field of imposter syndrome research should revise its scope to include both men and women in future analyses and investigations. More research could also move focus onto both the prevention and treatment of imposter syndrome within student bodies. As this is a condition that can significantly impair individuals both academically, mentally, and socially (Bravata et al, 2020; Clance & Imes, 1978; Cusack et al., 2013), further systems should be developed to aid these students and improve their academic and intrapersonal outcomes.

In sum, this study succeeded in administering the Clance IP Scale to a novel population within a rural university to assess imposter syndrome rates between genders and majors. Our results not only indicated that STEM majors and women experience more imposter syndrome on average in comparison to other students, but that all types of students tend to experience at least moderate imposter syndrome on average. Such prevalence results demonstrate a presence of imposter syndrome in the men that has not been widely researched before. With our findings in mind, further imposter syndrome research focusing on men and larger student populations is warranted. As imposter syndrome appears to be a phenomenon that impacts not only the women and STEM fields, but all other student demographics, it is important that further research be conducted regarding the treatment and prevention of imposter syndrome.

References

- Beesley, B. & Vece, N. (2023, November 22). *Imposter syndrome materials*. <https://osf.io/tmcae/>
- Bravata, D., Madhusudhan, D., Boroff, M., & Cokley, K. (2020). Commentary: Prevalence, predictors, and treatment of imposter syndrome: A systematic review. *Journal of Mental Health & Clinical Psychology*, 4(3), 12–16. <https://doi.org/10.29245/2578-2959/2020/31207>
- Charlesworth, T. E., & Banaji, M. R. (2021b). Patterns of implicit and explicit stereotypes iii: Long-term change in gender stereotypes. *Social Psychological and Personality Science*, 13(1), 14–26. <https://doi.org/10.1177/1948550620988425>
- Clance, P. R. (1985). *The impostor phenomenon: Overcoming the fear that haunts your success*. Peachtree Publishers.
- Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241–247. <https://doi.org/10.1037/h0086006>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). *Perceived stress scale* [Database record]. APA PsycTests. <https://doi.org/10.1037/t02889-000>
- Cusack, C. E., Hughes, J. L., & Nuhu, N. (2013). Connecting gender and mental health to imposter phenomenon feelings. *Psi Chi Journal of Psychological Research*, 18(2), 74–81. <https://doi.org/10.24839/2164-8204.jn18.2.74>
- Davis, G., & Hill, L. (2018). *Portray Her*. Lydia Hill Foundation & The Geena Davis Institute on Gender in Media. <https://seejane.org/wp-content/uploads/portray-her-full-report.pdf>
- Eastern Oregon University. (2023). *EOU quick facts - Total enrollment*. Eastern Oregon University. https://www.eou.edu/institutional-effectiveness/files/2023/11/EOU_Quick_Facts_2023.pdf
- Flett, G. L., Hewitt, P. L., Boucher, D. J., Davidson, L. A., & Munro, Y. (1997). *Child and Adolescent Perfectionism Scale (CAPS)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t00787-000>
- Gardner, R. G., Bednar, J. S., Stewart, B. W., Oldroyd, J. B., & Moore, J. (2019). "I must have slipped through the cracks somehow": An examination of coping with perceived impostorism and the role of social support. *Journal of Vocational Behavior*, 115, 103337. <https://doi.org/10.1016/j.jvb.2019.103337>
- Goldberg, D. P. (1972). The detection of psychiatric illness by questionnaire (Maudsley Monograph No. 21). Oxford University Press.
- Goldberg, L. (2022, February 21). *International personality item pool*. International Personality Item Pool. <https://ipip.ori.org/index.htm>
- Holmes, S. W., Kertay, L., Adamson, L. B., Holland, C. L., & Clance, P. R. (1993). Measuring the impostor phenomenon: A comparison of Clance's IP Scale and Harvey's I-P Scale. *Journal of Personality Assessment*, 60(1), 48–59. https://doi.org/10.1207/s15327752jpa6001_3
- Lovibond, S. H., & Lovibond, P. F. (1995). *Depression anxiety stress scales (DASS–21, DASS–42)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t01004-000>
- Maddi, S. R., & Khoshaba, D. M. (2001). *Personal views survey III-R: Test development and internet instruction manual*. Hardiness Institute.
- Mak, K., Kleitman, S., & Abbott, M. J. (2019). Impostor phenomenon measurement scales: A systematic review. *Frontiers in Psychology*, 10, 671. <https://doi.org/10.3389/fpsyg.2019.00671>
- May, R. W., & Casazza, S. P. (2012). Academic major as a perceived stress indicator: Extending stress management intervention. *College Student Journal*, 46(2), 264–273. <https://doi.org/htweb.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=05b99c2d-5c52-48c2-9a70-c6c1535f70b9%40redis>
- National Center for Science and Engineering Statistics (NCSES). (2023). *Diversity and STEM: Women, minorities, and persons with disabilities*. National Science Foundation. [https://ncses.nsf.gov/pubs/nsf23315/report/the-stem-workforce#:~:text=The%20share%0f%20women%20and,\(figure%20%2D3\).](https://ncses.nsf.gov/pubs/nsf23315/report/the-stem-workforce#:~:text=The%20share%0f%20women%20and,(figure%20%2D3).)
- Qureshi, M. A., Taj, J., Latif, M. Z., Zia, S., Rafique, M., & Chaudhry, M. A. (2017). Imposter syndrome among Pakistani medical students. *Annals of King Edward Medical University*, 23(2). <https://doi.org/10.21649/akemuv.23i2.1647>
- Roets, C. J. P. (1991). *The relationship of the impostor phenomenon to college major and attributional style*. [Doctoral dissertation, Marquette University]. Raynor Memorial Libraries. <https://epublications.marquette.edu/dissertations/AAI9133808/>
- Rosenberg, M. (1965). *Rosenberg self-esteem scale (RSES)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t01038-000>
- Singelis (1994). *Self-sonstrual scale*. SPARQtools. <https://sparqtools.org/wp-content/uploads/2022/10/Self-Construal-Scale.pdf>

- Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The revised almost perfect scale. *Measurement and Evaluation in Counseling and Development*, 34(3), 130-145. <https://doi.org/10.1080/07481756.2002.12069030>
- Taylor, J., & Deane, F. P. (2002). Development of a short form of the Test Anxiety Inventory (TAI). *The Journal of General Psychology*, 129(2), 127-136. <https://doi.org/10.1080/00221300209603133>
- Villwock, J. A., Sobin, L. B., Koester, L. A., & Harris, T. M. (2016). Impostor syndrome and burnout among American medical students: A pilot study. *International Journal of Medical Education*, 7, 364-369. <https://doi.org/10.5116/ijme.5801.eac4>
- Wang, K. T., Sheveleva, M. S., & Permyakova, T. M. (2019). Imposter syndrome among Russian students: The link between perfectionism and psychological distress. *Personality and Individual Differences*, 143, 1-6. <https://doi.org/10.1016/j.paid.2019.02.005>

Author Note.

Nicholas G. Vece  <https://orcid.org/0009-0001-9673-8207>

Zoe Johnson-Ulrich  <https://orcid.org/0000-0001-6000-5880>

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Any attempts to contact the research team should be sent to Nicholas Vece, Department of Psychology, Eastern Oregon University, One University Blvd., La Grande, OR, 97850-2807, United States. Email: nvece@eou.edu

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