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Gender, Graduate School Stage, and the Impostor Phenomenon

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ABSTRACT

The impostor phenomenon (IP) includes five central factors: (a) a sense of fraudulence or phoniness; (b) a fear of failure and discovery; (c) compensatory perfectionism (i.e., procrastination and/or over-preparation); (d) interpersonal anxiety; and (e) externalized success and/or discounted positive feedback. After the final stage, the process starts over with reinforced vigor, creating a self-reinforcing cycle in which success is associated with psychological suffering. IP was initially used to describe the reports of high-achieving women, but recent studies have shown that IP is experienced across genders. Additionally, while graduate school is an achievement-oriented environment with many characteristics that could promote IP, it has never been studied within graduate students specifically. The current investigation assessed graduate student endorsements of IP across genders (i.e., female and male) and graduate school stages (i.e., incoming and established students). Though the hypotheses were not supported, the results led to multiple areas of future study that could help explain the unexpected findings and promote graduate student well-being and success.

Keywords

Impostor phenomenon, Gender, Graduate School

GENDER, GRADUATE SCHOOL STAGE, AND THE IMPOSTOR PHENOMENON

Clance and Imes (1978) introduced the term *impostor phenomenon* (IP) to describe the reports of high-achieving women who felt fraudulent, feared others would discover and expose their true abilities, and externalized their ensuing successes. These women would consistently doubt their abilities, become fearful and work exceedingly hard to prevent others from seeing their perceived phoniness, and attribute their successes to luck, evaluative error, or inordinately hard work. Therefore, rather than reducing IP, success and positive feedback were shown to reinforce self-doubt and social fear. These unpleasant experiences were the central contributors to the behaviors (e.g., hard work) that were associated with positive outcomes.

IP is often conceptualized as a cyclical, multidimensional construct that includes five central factors: (a) a sense of fraudulence or phoniness; (b) a fear of failure and discovery; (c) compensatory perfectionism (i.e., procrastination and/or over-preparation); (d) interpersonal anxiety; and (e) externalized success and/or discounted positive feedback (Caselman et al., 2006; Clance & Imes, 1978; Clance & O'Toole, 1988; Hutchins & Rainbolt, 2017; Tigranyan et al., 2020; Vaughn et al., 2020). After the final stage (i.e., externalized success and discounted positive feedback), the IP process starts over with reinforced vigor, and years of similar experiences create a powerful, self-reinforcing cycle in which success is associated with

psychological suffering and positive feedback is met with skepticism because it is inconsistent with internal experiences (Clance & O'Toole, 1988).

Others have conducted research based on a unidimensional IP construct (i.e., a sense of fraudulence or inauthenticity) that is intended to represent the essence of IP (Leary et al., 2000). Leary and colleagues (2000) developed the *Leary Impostorism Scale* based on this notion and found that it maintained a correlation of .70-.80 with existing IP measures with no statistically significant gender differences.

Researchers have continued to investigate IP, and it has since been expanded to describe the experiences of high-achieving individuals across genders and settings, especially those like higher education that select for and reinforce high-achievement attitudes (Lee et al., 2022; Muradoglu et al., 2022; Vaughn et al., 2020). In their seminal study, Clance and Imes (1978) included undergraduates, graduate students, and faculty members to study IP across developmental stages. Subsequent studies have investigated the effects of professional stage (i.e., early career vs. late career) on IP among individuals in various university positions (Muradoglu et al., 2022; Vaughn et al., 2020), but student experiences within graduate school have not been specifically assessed. Thus, the current study was designed to study the incidence of IP among graduate students of all genders who occupy different graduate school stages (i.e., incoming first-year students vs. established students who had spent at least one full semester in graduate school).

IP IN HIGHER EDUCATION

In the context of IP, higher education can be conceptualized as an achievement-oriented community that is populated by high-achieving individuals (Posselt, 2016). Applicants with the most historical achievement are generally the ones who gain admission (Cassuto, 2015) because their experiences suggest they can meet the demands of such an environment (Cassuto, 2015; Council of Graduate Schools, 2012). Meanwhile, environmental demands often require students to step out of their comfort zones as they learn new information, acquire new skills, and get evaluated on their performances in these pursuits (Mangan, 2021). Performance is often considered a signal of value (Posselt, 2016) since grades are a major factor in gaining acceptance into internships, fellowships, and other scholastic programs in this competitive atmosphere.

The strength of this person-environment fit would only intensify in the highest levels of higher education (e.g., graduate school and medical school) in which communities with the greatest achievement-related demands would only select those with the strongest historical achievement. Thus, the characteristics of university life would seem to promote an increased prevalence of IP, and indeed, studies consistently show that it is a place where students (Muradoglu et al., 2021; Tigranyan et al., 2020) and faculty members (Hutchins & Rainbolt, 2017) alike often feel under-prepared, phony, and

anxious. However, there is evidence to suggest that IP experiences might be influenced by other contextualizing factors, such as gender and graduate school stage.

Gender

Despite its early emphasis on the experiences of women (Clance & Imes, 1978), there are mixed findings regarding gender differences in IP, and men often experience it as well (Clance & Imes, 1988; Vaughn et al., 2020). However, those of a minority gender in a given field (Hutchins & Rainbolt, 2017; Vaughn et al., 2020) or those with a stronger sense of gender stigma consciousness (Cokley et al., 2015) have been shown to be particularly vulnerable. At present, there is a dearth of information about IP experiences amongst LGBTQ+ students.

Graduate School Stage

IP is consistently elevated in early career academics (Muradoglu et al., 2021) as well as in those who are engaging with novel, challenging environments (Vaughn et al., 2020). However, there is no information regarding the experiences of graduate students across years of study. It seems that incoming students, who have some or no experience in graduate school and are entering a novel, challenging environment, would likely endorse higher rates of IP compared to their established colleagues, who are contending with a challenging but less novel environment. Moreover, established students have had the opportunity to build relationships with classmates, thus potentially diminishing the social effects of IP.

RESEARCH QUESTIONS

1. Is the impostor phenomenon equally endorsed across genders?
2. Do incoming graduate students endorse higher rates of imposter phenomenon than established students?

HYPOTHESES

To answer these questions, the current study aimed to study group differences within the domains of gender (male and female) and graduate school stage (established students and incoming students). The following hypotheses were naturally generated:

H_{0a}: There will be no statistically significant difference of reported IP between genders.

H_{1a}: There will be a statistically significant difference of reported IP between genders.

H_{0b}: There will be no statistically significant difference of reported IP between graduate school stage groups.

H_{1b}: There will be a statistically significant difference of reported IP between graduate school stage groups.

Previous studies have shown that IP is present across genders and higher among those who are engaging with novel, challenging environments. These findings suggested that

hypotheses H_{0a} and H_{1b} would be supported in this study. Thus, it was predicted that IP would be equally distributed across genders, resulting in non-significant results between males and females, and incoming students would endorse higher rates of IP compared to established students.

METHOD

PARTICIPANTS

The participants consisted of female ($n = 234$) and male ($n = 65$) identifying graduate students at a southern university ($N = 299$). The representation of racial/ethnic identities within the sample are listed in Table 1.

Table 1

Representation of Racial/Ethnic Identities within the Sample

Racial/Ethnic Identity	Percentage of Sample	
	Established Students	Incoming Students
African American/ Black	9.2	10.0
Asian	1.8	2.9
Native American/ Alaska Native	2.6	1.4
Native Hawaiian/ Pacific Islander	0.4	0.0
White	87.3	84.3
Prefer not to respond	0.9	1.4
I prefer to type my answer	1.8	0.0

Note. The cumulative percentage is greater than 100 because participants were allowed to choose multiple responses.

The sample was also divided into two groups designed to represent different graduate school stages: one group of respondents at the end of the 2022 academic year (established students group, $n = 229$) and another group of respondents from incoming students in 2023 (incoming students group, $n = 70$). The majority of participants were from age 18 to 34 (66.8%). The age breakdown within the sample is represented in Table 2.

Table 2

Age Breakdown within the Sample

Age	Percentage of Sample	
	Established Students	Incoming Students
Under 18	0.0	0.0
18 - 24	33.6	48.6
25 - 34	34.5	18.6
35 - 44	14.8	22.9
45 - 54	12.7	5.7
55 - 64	3.5	5.7
Over 65	1.8	0.0

MEASURE: LEARY IMPOSTORISM SCALE

Participants completed the Leary Impostorism Scale (LIS; Leary et al., 2000). In the developmental study, the LIS demonstrated high inter-item reliability (Cronbach's $\alpha = .87$), strong correlations ($r = .70 - .80$) with existing measures, substantial support for construct validity, and no evidence of gender bias. In the current study, the scale was administered online via a digital form.

PROCEDURE

The administration started with a demographics section in which the students were asked to provide their age (under 18, 18 - 24 years old, 25 - 34 years old, 35 - 44 years old, 45 - 54 years old, 55 - 64 years old, 65 years or older, prefer not to respond), race (African American/Black, Asian, Native American/Alaska Native, Native Hawaiian/Pacific Islander, White, prefer not to respond, I prefer to type my answer), and gender (male, female, non-binary, transgender, intersex, prefer not to respond, I prefer to type my answer). Then, the LIS was administered asynchronously to two groups of graduate students.

The first administration was open to all graduate students and administered towards the end of the academic year. After completing the LIS, respondents were given the option of providing their school email to enter a giveaway for a prize. The second group consisted of incoming graduate students, and they received a link to the questionnaire during new student orientation webinars at the beginning of the following academic year. Upon completing the LIS, the respondents were also given the option of providing their school email to enter a giveaway for a prize.

RESULTS

The research design called for a 2 x 2 between-subjects factorial ANOVA, which requires the satisfaction of several assumptions including independence of observations, homogeneity of variance, and normality of residuals. To promote the independence of observations, the established student group was sampled before the incoming students group. Moreover, only students who were labeled by the university as an incoming student received an invite to attend the incoming students webinar where the survey link was released. Homogeneity of variance was tested by Levene's Test, which showed that the variances of impostorism were similar across groups, $F(3, 295) = 1.48, p = .22$, thus satisfying the assumption. However, the Shapiro-Wilk test revealed that the residuals significantly deviated from normality, $W(299) = .93, p < .001$, which violates the assumption of normality of residuals. Analyses with sample sizes greater than 30 to 40 are believed to be robust to violations of normality in accordance with the central limit theory (Ghasemi & Zahediasl, 2012). Given the current study's total sample size ($N = 299$), the violation was considered minor, and the analysis continued.

A 2 x 2 between-subjects factorial ANOVA was performed to determine if there were differences in impostorism for graduate students depending upon gender and graduate school stage. There was no significant main effect for graduate school stage $F(1, 295) = .48, p = .49, \eta^2 p = .002$, which signified there was no significant difference in impostorism scores for established graduate students ($M = 15.25, SE = .60$) and incoming students ($M = 14.42, SE = 1.05$). However, there was a significant main effect for gender $F(1, 295) = 4.19, p = .04, \eta^2 p = .02$. Those who identified as female ($M = 16.07, SE = .57$) endorsed significantly higher rates of impostorism than those who identified as male ($M = 13.60, SE = 1.06$). There were no significant interaction effects for graduate school stage x gender $F(1, 295) = 2.12, p = .15, \eta^2 p = .01$, or gender x graduate school stage $F(1, 295) = .55, p = .46, \eta^2 p = .002$.

DISCUSSION

Previous research on IP led to two predictions for this study: 1) there would be no statistically significant difference of reported IP between genders and 2) there would be a statistically significant difference of reported IP between graduate school stage groups. Neither of the proposed hypotheses was supported by the data.

There was a statistically significant difference of reported IP between females and males, which is consistent with seminal IP research (Clance & Imes, 1978) but inconsistent with more recent findings (Clance & Imes, 1988; Vaughn et al, 2020). Those of a minority gender in a given field are indeed vulnerable to experiences of IP (Hutchins & Rainbolt, 2017; Vaughn et al., 2020), but there is no evidence to suggest that females occupy that position at the participating university. However, high gender stigma consciousness, which was not

assessed, has also been associated with an increased incidence of IP (Cokley et al., 2015). This factor could help explain the results if female graduate students in this sample were experiencing higher levels of gender stigma consciousness than their male counterparts.

Another possible explanation comes from Big Five personality literature. On average, females have been consistently shown to score higher than males within the personality trait Neuroticism, which is a measure of the proclivity to experience negative emotions, such as anxiety, self-consciousness, and low self-esteem (Weisberg et al., 2011). There have been few studies on the relationship between Big Five personality traits and IP, but given the anxiety and general unpleasantness of IP, Neuroticism could certainly play a role in IP experiences. Available studies support the theoretical link between Neuroticism and IP and report significant correlations ranging from .34 to .63 (Bernard et al., 2002; Choe et al., 1995; Kaur & Jain, 2022; Sawant et al., 2023). Future studies will need to account for gender stigma, personality traits, and other factors that are associated with gender differences when investigating the relationship between gender and IP.

Meanwhile, there was no statistically significant difference of reported IP between established and incoming graduate students. The premise for the predicted difference was based on the notion that incoming students would face more relative challenges and novelty compared to established students, who have presumably adjusted to the difficulties of graduate school. However, established graduate students must also face new challenges, such as theses, dissertations, internships, and graduation, that could reintroduce IP. Indeed, Sawant and colleagues (2023) found that reported IP decreased from year one to year three but then increased to near baseline levels during the final and internship years of medical students.

The null results might also be explained by reinforcement patterns of IP. Established students with their inherent academic successes (e.g., successful progression through graduate school) might have had more time to reinforce IP with those successes. In other words, novel, challenging circumstances might promote initial IP, but it could be reinforced in high-achievement environments where external sources of success (e.g., grades, publications, etc.) might seem more salient than internal ones (e.g., personal development). Future studies could tease apart these contributors by accounting for appraisals, attitudes, values, and other relevant factors that could be related to these reinforcement patterns.

LIMITATIONS

There were three limitations to this study. One limitation was the LIS measure itself. According to Mak et al. (2019), one major limitation of the LIS is that it uses a unidimensional score that may inadequately represent the multidimensionality of IP and diminish the role of success in perpetuating IP. For example, the LIS focuses on general experiences related to the

IP and fails to address success at all. Success is an important factor in IP research because it is often used to justify and reinforce the IP cycle despite the inhibitive and distressing nature of that successful process. Ibrahim et al. (2020) experienced some success in developing a multidimensional IP (IPP31) scale, but it is quite new and has received less psychometric support.

Another limitation was representativeness: the sample might have failed to capture the established graduate student experience. Namely, by administering the sample towards the end of the year, the researchers might have failed to sample experiences from students who were most significantly impacted by IP (i.e., those who became increasingly disengaged or even dropped from their programs). Moreover, those who were experiencing more significant levels of IP might have been less motivated to participate in research in general. Lastly, there were not enough responses to include racial and non-binary gender factors and contribute to important areas of limited research.

A final limitation was specificity. The established students group likely involved students from multiple years of study, which invariably complicated the findings. There was no way to determine how well each stage was represented, how specific graduate years might influence IP, or how many of those in the incoming students group had previous graduate school experience. Overall, participating students were not given the option to specify characteristics that are potentially influential in IP, such as numerical age, program type (certificate, specialist, master's, doctoral), current year of graduate study (1, 2, 3, 4, 5+), previous graduate school experience (yes or no), program delivery (in-person, online, hybrid), previous academic experience at the institution (yes or no), or first-generation student status (yes or no). Other possible confounding variables, such as religion/spirituality, personal values, public versus private institution, and marital status, were also not assessed, but they could be important variables in future studies. If properly accounted for, these variables could provide more context to IP and be of more use to graduate administrators who wish to reduce it.

FUTURE DIRECTIONS

Future gender-related inquiries necessitate the inclusion of important gender-related variables, such as gender stigma consciousness and Big Five personality traits, namely Neuroticism. These factors likely play an influential role in IP experiences and need to be accounted for.

Those investigating specific relationships between graduate school and IP (e.g., academic year and IP) will need to provide appropriate options in the demographic section, including numerical age, program type (certificate, specialist, master's, doctoral), current year of graduate study (1, 2, 3, 4, 5+), previous graduate school experience (yes or no), program delivery (in-person, online, hybrid), previous academic experience at the institution (yes or no), and first-generation student status (yes or no). This will help rule out the influence of extraneous variables and likely provide more useful information to graduate school administrators. Additionally, high-achievement settings, such as graduate schools, will need to assess the success dimension of IP to investigate which distressing IP factors are being reinforced by success and inhibiting optimal functioning.

Overall, future studies will also need to address the multidimensional nature of IP to adequately capture the experiences of graduate students and others. This research could help assess the influences of specific IP factors across demographics and domains.

CONCLUSION

This study was designed to investigate an important, yet under-researched topic: the impostor phenomenon in graduate school. Though the hypotheses were not supported, the results led to multiple areas of future study that could help explain the unexpected findings, add important contributions to IP literature, and promote graduate student well-being and success. In general, it is particularly important for achievement-based settings, such as graduate schools, to assess the level of success-mediated IP and implement interventions that break the IP cycle by dissociating success and distress.

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Angela T. Barlow, Ph.D. is a professor of mathematics education and the dean of the College of Education and Professional Studies at the University of South Alabama. In addition, she is the inaugural editor-in-chief for the National Council of Teachers of Mathematics' newest journal, *Mathematics Teacher: Learning & Teaching PK-12*. Dr. Barlow's research interests focus on the professional development needs of elementary mathematics teachers as they engage in the instructional change process.