



The roles of impostorism and academic help-seeking in undergraduate students' sense of belonging and college completion intention

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Abstract

Impostorism is characterized by feelings of self-doubt regarding one's competence, ability, and deservingness of past achievements, despite evidence of competence. Impostorism has been shown to be associated with numerous adverse academic and psychosocial outcomes. However, there is limited research investigating these relationships within the general undergraduate student population. Furthermore, there is a lack of research examining the link between impostorism and academic help-seeking. The current study aims to fill the gaps by investigating the roles of impostorism and academic help-seeking attitudes and behaviors in undergraduate students' academic sense of belonging and college completion intention. A total of 2,808 diverse groups of undergraduate students from two universities in the U.S. were recruited in the study. Regression analyses demonstrated that higher levels of impostorism were linked to negative attitudes toward academic help-seeking, increased academic help-seeking avoidance behaviors, decreased academic sense of belonging, and lower intention to complete undergraduate studies. Additionally, mediation analyses revealed academic help-seeking attitudes and behaviors as the mediating factors through which impostorism affects academic sense of belonging and college completion intention. Implications and future directions are discussed.

Keywords Impostorism · Academic help-seeking · Sense of belonging · College completion intention

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1 Introduction

Impostorism (Clance & Imes, 1978) involves self-perceptions related to one's competence, ability, and deservingness in both academic as well as professional settings. More specifically, it is a psychological experience of intellectual fraudulence and feelings of inadequacy experienced among high achieving individuals (Clance & Imes, 1978; Sakulku & Alexander, 2011 for review). This phenomenon was first discussed in Clance and Imes' (1978) paper, which was based on clinical observations of high achieving women across a wide range of professions (e.g., law, nursing, social work) as well as undergraduate and graduate students, and professors. Later works have empirically studied this phenomenon among diverse populations, including children and adolescents (e.g., Caselman & Self, & Self, 2006; Chayer & Bouffard, 2010), undergraduate students (e.g., Kumar & Jagacinski, 2006), graduate students (e.g., Cohen & McConnell, 2019), post-doctoral researchers and professors (e.g., Hutchins & Rainbolt, 2017; Muradoglu et al., 2022), underrepresented minority students (e.g., students of color: Cokley et al., 2013; women in STEM: Tao & Gloria, 2019), and working professionals (e.g., Hochman et al., 2023; Vergauwe et al., 2015).

There are several central characteristics that broadly capture the construct of impostorism. First, individuals who experience impostorism have a sense of fraudulence, in that they believe that others (e.g., professors, peers) are overestimating their abilities. Second, they often attribute their success to factors apart from their inherent abilities and do not internalize their success. Third, they often focus on their shortcomings and are highly critical of their work and performance. Fourth, they fear that they are unable to replicate their success. Another important characteristic of individuals who struggle with impostorism is that they fear that they will someday be discovered as a fraud and that their true lack of abilities or intelligence will be revealed (Clance & Imes, 1978; Clance & O'Toole, 1987).

1.1 Academic and psychosocial impacts of impostorism

The fears and doubts associated with impostorism can have detrimental effects on individuals' psychological well-being (e.g., Chrisman et al., 1995; McGregor et al., 2008; Sonnak & Towell, 2001). For instance, higher levels of impostorism are associated with higher levels of depression, anxiety, stress, and poor general mental health (Chrisman et al., 1995; Henning et al., 1998; McGregor et al., 2008; Sonnak & Towell, 2001). Additionally, findings from Henning et al. (1998) showed that impostorism strongly predicted psychological distress above and beyond other related factors, including previous mental health and demographic variables such as age, sex, and race.

Furthermore, experiences of impostorism can have a negative impact on one's psychosocial and academic outcomes (e.g., Clark et al., 2021; Tao & Gloria, 2019; Yaffe, 2023). For instance, Tao and Gloria (2019) found that among women enrolled in STEM Ph.D. programs in the U.S., impostorism predicted more negative persistence attitudes toward their academic studies, a relationship which was mediated by lower academic self-efficacy and negative academic environment. Similarly, Clark and colleagues' (2021) recent longitudinal study in the U.S. found the link between

impostorism and persistence, which was also mediated by academic self-efficacy as well as academic sense of belonging. More specifically, the results demonstrated that impostorism predicted lower levels of academic self-efficacy and academic sense of belonging, which independently predicted a stronger consideration of dropping out of their academic program (Clark et al., 2021).

Similarly, a longitudinal study of impostorism among first-generation undergraduate students in the U.S. found that a competitive classroom environment was related to higher levels of reported imposter feelings among all students, but this relationship was especially strong for first-generation students. Feelings of impostorism predicted attendance, engagement, intentions to drop-out of the class, and course grade for these students (Canning et al., 2020).

Although studies have begun to investigate the link between impostorism and academic engagement variables, such as academic sense of belonging and intentions of dropping out (e.g., Canning et al., 2020; Clark et al., 2021), there is limited research investigating the academic and psychosocial consequences of impostorism among general undergraduate student populations. Given that 37.6% of undergraduate students do not obtain a bachelor's degree at the first institution they attended within 6 years (De Brey et al., 2021), understanding the factors contributing to academic challenges and dropout intentions is crucial. Furthermore, there is lack of research exploring the mediating mechanisms through which impostorism affects undergraduate students' academic and psychosocial outcomes. Considering that fear of being discovered as an intellectual fraud is a central characteristic of impostorism, it is likely that students with high levels of impostorism would have negative attitudes towards help-seeking and avoid seeking help (primarily from professors, who are in the position of evaluating students' academic abilities). The present study aims to address this gap by investigating the relationship between impostorism and academic help-seeking attitudes.

1.2 Academic help-seeking

Academic help-seeking, a unique self-regulated behavior important for academic engagement, is an essential strategy for self-directed learners (Karabenick, 1998; Smalley & Hopkins, 2020). There is growing evidence that self-regulated learning strategies are linked to student's motivations to achieve learning outcomes (Karabenick et al., 2021). Academic performance is positively related to help-seeking in K-12 as well as undergraduate students (Karabenick, 2003). Help-seeking behaviors in an academic context typically involves seeking help from individuals or other sources in order to increase positive academic outcomes (Martin-Arbo et al., 2021). Whether students seek help depends on their perceptions of the cost and benefits of doing so, perceptions of help-seeking as a threat, and sources of assistance. More research has turned to assessing help-seeking to understand insights into learning and goal achievement (Karabenick, 2003; Won et al., 2021). Help-seeking behaviors involve both cognitive (i.e., one recognizes the need for help) and social (i.e., one asks for help) competencies, which illustrate the uniqueness of help seeking when compared to other cognitive learning strategies (Karabenick & Berger, 2013).

In addition to exploring the importance and impacts of help-seeking behavior, past research has begun to tease apart variables that influence help-seeking behavior, such as goal perceptions. As such, student perceptions of the achievement goal structure within an undergraduate class plays a role in help-seeking behavior. For example, help-seeking behavior was predicted by a perceived emphasis on mastery (as opposed to an emphasis on performance) in an undergraduate psychology class. As such, mastery goals were linked to the perception that help seeking behaviors can be adaptive in a learning context (Karabenick, 2004). Thus, some researchers advocate that promotion of environments focused on mastery rather than competition may encourage help-seeking behaviors (Karabenick & Berger, 2013). Other research has turned to examining psychosocial variables (e.g., sense of belonging, self-efficacy) and academic help-seeking behavior. In a survey of undergraduate students, both sense of belonging and self-efficacy were significant predictors of help-seeking behaviors (Won et al., 2021). Similarly, in a study of Australian students, academic self-efficacy was negatively related to help-seeking avoidance (Smalley & Hopkins, 2020). Among undergraduate students in the U.S., academic self-efficacy was associated with seeking help to aid in understanding (Karabenick, 2003). Help-seeking was positively related to academic self-efficacy, theories of intelligence, and mastery goals in a sample of first year undergraduate students at a U.S. university (Finney et al., 2018).

1.3 Current research

The present study aims to investigate the associations between impostorism and academic sense of belonging as well as college completion intention among diverse samples of undergraduate students, where insufficient research exists. Furthermore, to our knowledge, no published empirical studies have explored the link between impostorism and academic help-seeking. Therefore, the current study aims to examine the relationships between impostorism and academic help-seeking attitudes as well as help-seeking avoidance behaviors. Additionally, it seeks to explore their mediating effects on academic sense of belonging and college completion intention. It was hypothesized that impostorism would predict negative academic help-seeking attitudes and behaviors even when controlling for GPA, such that higher levels of impostorism would predict greater negative attitudes towards academic help-seeking (H1a) and greater help-seeking avoidance behaviors (H1b). It was also hypothesized that impostorism would predict negative academic engagement variables even when controlling for GPA, such that higher levels of impostorism would predict lower academic sense of belonging (H2a) and lower intention to complete undergraduate studies (H2b). Additionally, it was hypothesized that academic help-seeking attitudes and behaviors would independently mediate the association between impostorism and academic sense of belonging, and between impostorism and college completion intention even when controlling for GPA (see Fig. 1). More specifically, it was hypothesized that impostorism would predict greater negative attitudes towards academic help-seeking, which would then predict lower academic sense of belonging (H3a) as well as lower college completion intention (H3b) (see Fig. 1). Similarly, it was hypothesized that impostorism would predict greater academic help-seeking

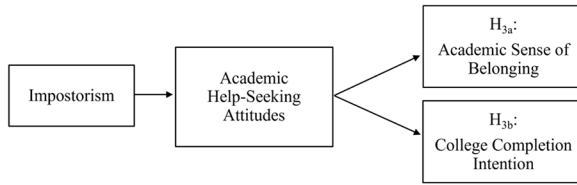


Fig. 1 Hypothesized Mediation Model with Academic Help-Seeking Attitudes as the Mediator. Note: Impostorism is hypothesized to predict negative academic help-seeking attitudes, which then predict lower academic sense of belonging and lower college completion intention

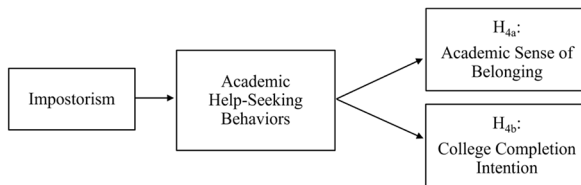


Fig. 2 Hypothesized Mediation Model with Academic Help-Seeking Behaviors as the Mediator. Note: Impostorism is hypothesized to predict higher academic help-seeking avoidance behaviors, which then predict lower academic sense of belonging and lower college completion intention

avoidance behaviors, which would then predict lower academic sense of belonging (H4a) as well as lower college completion intention (H4b) (see Fig. 2).

2 Method

2.1 Participants

2.1.1 Sample 1

A total of 1,869 participants from a public university in the Northeastern U.S. participated in the study ($M_{age}=19.00$, $SD_{age}=1.56$; 73.2% women, 23.4% men, 1.5% other gender identity, 1.8% missing response). Participants were racially/ethnically diverse with 60.0% of participants identifying as White/European American, 20.4% as Asian, 8.3% as Latino/Hispanic, 5.8% as Black/African American, 0.2% as Native Hawaiian or other Pacific Islander, 3.4% as other race, and 1.9% missing response. The majority of the participants were either first or second year students (48.5% first year, 35.0% second year, 11.1% third year, 3.1% fourth year, 0.4% fifth year, 1.9% missing response). Lastly, the self-reported socioeconomic status predominantly ranged from the lower middle class to the upper middle class (3.5% lower class, 3.2% upper lower class, 10.1% lower middle class, 25.4% middle class, 18.3% upper middle class, 1.0% upper class, 38.5% missing response). Using the exclusion criteria from previous research (Lytle & Shin, 2020; 2022; 2023), 135 participants were removed as their survey completion time was less than 3 min or longer than 90 min. The

final sample included in the analyses was 1,734 participants and the average survey completion time was 14.29 min.

2.1.2 Sample 2

A total of 939 participants from a private university in the Northeastern U.S. participated in the study ($M_{\text{age}}=18.30$, $SD_{\text{age}}=0.89$; 35.3% women, 61.7% men, 1.9% other gender identity, 1.2% missing response). Participants were racially/ethnically diverse with 50.3% of participants identifying as White/European American, 13.2% as East Asian and 13.6% as South Asian, 13.4% as Latino/Hispanic, 2.2% as Black/African American, 0.7% as American Indian or Alaska Native, 0.5% as Native Hawaiian or other Pacific Islander, 4.3% as other race, and 1.8% missing response. The majority of the participants were first year students (93.1% first year, 3.7% second year, 1.4% third year, 0.2% fourth year, 0.3% fifth year, 1.3% missing response). Lastly, the self-reported socioeconomic status mainly fell within the lower middle class to upper middle class categories (2.5% lower class, 3.5% upper lower class, 12.2% lower middle class, 37.8% middle class, 35.9% upper middle class, 4.9% upper class, 3.2% missing response). Using the same exclusion criteria used for Sample 1, a total of 98 participants were removed from the analyses. The final sample included in the analyses was 841 participants and the average survey completion time was 14.52 min.

2.2 Procedure

Sample 1 participants were recruited through the subject pool at Author 1's institution (between Spring 2020 and Spring 2022) and Sample 2 participants were recruited through the subject pool at Author 2's institution (Fall 2022). The subject pool at Author 1's institution is a psychology subject pool that includes approximately 1,000 students per semester and consists of students from diverse fields of study (e.g., psychology, integrative neuroscience, biology, economics, business, computer science). Students enrolled in certain undergraduate courses in the psychology department (e.g., General Psychology) are required to participate in one or more research studies but they have the option to complete an alternative assignment if they do not wish to participate in research. The subject pool at Author 2's institution includes approximately 1,000 students and is not specific to a major or course, but instead includes all first-year students from a wide range of STEM fields (e.g., computer science, mechanical engineering, biomedical engineering, quantitative finance, computer engineering, business and technology). If they so choose, students are able to opt out of human subject studies by completing an alternative assignment.

The study was described as a study of college students' academic related attitudes, feelings, and behaviors. Participants were instructed to review the informed consent document online and indicate their consent by proceeding with the survey, which was administered via Qualtrics, an online survey platform. The survey included measures for the variables of interest (impostorism, academic help-seeking attitudes and behaviors, academic sense of belonging, college completion intention) as well as a demographic questionnaire. Each university's institutional review board independently approved the study.

2.3 Measures

2.3.1 Impostorism

Participants completed a 20-item measure of impostorism (Clance & Imes, 1978) to indicate their impostor feelings ($\alpha=0.92$). Response options ranged from 1 (*not at all true*) to 5 (*very true*), with higher scores indicating greater experiences of impostorism. Sample items included: “Sometimes I’m afraid others will discover how much knowledge or ability I really lack,” “I avoid evaluations if possible and have a dread of others evaluating me,” and “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.” This scale is copyrighted and thus permission from the authors was obtained.

2.3.2 Negative academic help-seeking attitudes and avoidance behaviors

Participants completed the modified Help-Seeking Scale (Karabenick, 2003) used in Finney et al. (2018) to indicate their academic help-seeking attitudes and behaviors. This scale measures five dimensions of the help-seeking process: (1) help-seeking attitudes, (2) help-seeking avoidance behaviors, (3) sources of help, (4) instrumental help-seeking, and (5) executive help-seeking. Given that the present study is focused on negative help-seeking attitudes and avoidance behaviors, only the 3 items measuring negative help-seeking attitudes ($\alpha=0.85$) and 3 items measuring help-seeking avoidance behaviors ($\alpha=0.84$) were included in the analyses. Response options for all items ranged from 1 (*not at all true of me*) to 7 (*completely true of me*). Sample items included: “Getting help in my courses would be an admission that I am just not smart enough to do the work on my own.” (help-seeking attitudes) and “If I don’t understand something in my courses, I would guess rather than ask someone for assistance” (help-seeking avoidance behavior).

2.3.3 Academic sense of belonging

Participants completed the modified Affective Commitment Scale (Allen & Meyer, 1990) used in Shin et al. (2016) to indicate sense of belonging in their academic environment (i.e., major/field of study, department/program, school). This scale consisted of 6 items ($\alpha=0.89$) and sample items included: “I feel a strong sense of belonging to others in my major or field of study” and “Being at my school is an important part of who I am.” Response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*).

2.3.4 College completion intention

A 1-item scale was developed in the current study to measure participants’ intention to complete their undergraduate studies. Participants responded to the question, “How likely are you to complete your undergraduate studies?” using a scale ranging from 1 (*very unlikely*) to 7 (*very likely*).

2.3.5 Demographic questionnaire

Towards the end of the survey, participants reported their demographic information, including their age, gender, race, year in college, socioeconomic status, and GPA.

3 Results

3.1 Analysis overview

IBM SPSS Statistics (Version 29) was used for all analyses. A series of multiple regression analyses were performed to test Hypotheses 1a and 1b as well as Hypotheses 2a and 2b, which examined impostorism as the predictor of academic help-seeking attitudes and behaviors as well as academic sense of belonging and college completion intention. Additionally, a series of mediation analyses using Hayes' Process Macro (Model 4) were performed to test Hypotheses 3a and 3b (see Fig. 1) as well as 4a and 4b (see Fig. 2), which examined academic help-seeking attitudes and behaviors as the mediating factors.

A preliminary analysis revealed significant differences between Sample 1 and Sample 2, $F(5, 2009)=8.84$, $p<.001$; Wilks' Lambda=0.98, partial $\eta^2=0.02$, in the mean scores of some of the study variables (academic help-seeking attitudes: $F(1, 2013)=4.21$, $p=.04$, partial $\eta^2=0.002$; academic sense of belonging: $F(1, 2013)=22.65$, $p<.001$, partial $\eta^2=0.01$; college completion intention: $F(1, 2013)=5.37$, $p=.02$, partial $\eta^2=0.003$). However, hypothesis testing analyses conducted separately on each sample demonstrated similar patterns of results. Thus, the samples were combined to increase statistical power and to simplify the reporting of the results. The sample was added in all analyses as a control variable. Table 1 presents means, standard deviations, and correlations among all study variables.

3.2 Impostorism predicting academic help-seeking attitudes (H1a) and behaviors (H1b)

The first two hypotheses explored whether higher levels of impostorism would predict greater negative attitudes towards academic help-seeking (H1a) and greater help-seeking avoidance behaviors (H1b). The overall regression model predicting academic help-seeking attitudes was significant, $R^2=0.21$, $F(3, 2476)=214.41$, $p<.001$. Supporting Hypothesis 1a, impostorism was found to be a significant predictor of negative academic help-seeking attitudes even when controlling for GPA and sample, $\beta=0.96$, $p<.001$. Similarly, the overall regression model predicting academic help-seeking behaviors was significant, $R^2=0.12$, $F(3, 2476)=112.37$, $p<.001$. Supporting Hypothesis 1b, impostorism significantly predicted academic help-seeking avoidance behaviors even when controlling for GPA and sample, $\beta=0.61$, $p<.001$.

Table 1 Correlations, means, and standard deviations for all study variables

Variables	1 Impostorism	2 Negative Academic Help-Seeking Attitudes	3 Academic Help- Seeking Avoidance Behavior	4 Academic Sense of Belonging	5 College Completion Intention
Scale Range	1–5	1–7	1–7	1–7	1–7
Sample 1 (<i>n</i> = 1869)					
1	-	-	-	-	-
2	.44***	-	-	-	-
3	.31***	.74***	-	-	-
4	-.11***	-.14***	-.20***	-	-
5	-.07*	-.11***	-.18***	.17***	-
<i>M</i>	3.30	2.98	2.74	4.33	6.56
<i>SD</i>	0.73	1.60	1.47	1.30	1.09
Sample 2 (<i>n</i> = 939)					
1	-	-	-	-	-
2	.43***	-	-	-	-
3	.30***	.71***	-	-	-
4	-.11***	-.12***	-.13***	-	-
5	-.08*	-.10**	-.11**	.14***	-
<i>M</i>	3.30	3.19	2.83	4.55	6.43
<i>SD</i>	0.73	1.54	1.39	1.31	1.21

* $p < .05$; ** $p < .01$; *** $p < .001$

3.3 Impostorism predicting academic sense of belonging (H2a) and college completion intention (H2b)

The second set of hypotheses explored whether higher levels of impostorism would predict lower levels of academic sense of belonging (H2a) and college completion intention (H2b). The overall regression model predicting academic sense of belonging was significant, $R^2 = 0.03$, $F(3, 2476) = 24.54$, $p < .001$. Supporting Hypothesis 2a, impostorism was a significant predictor of lower academic sense of belonging even when controlling for GPA and sample, $\beta = -0.19$, $p < .001$. Similarly, the overall regression model predicting college completion intention was significant, $R^2 = 0.02$, $F(3, 1951) = 14.17$, $p < .001$. Supporting Hypothesis 2b, impostorism significantly predicted lower college completion intention even when controlling for GPA and sample, $\beta = -0.10$, $p = .004$.

3.4 Academic help-seeking attitudes mediating the effects of impostorism on academic sense of belonging (H3a) and college completion intention (H3b)

The next set of hypotheses investigated the mediating role of academic help-seeking attitudes in predicting academic sense of belonging (H3a) and college completion intention (H3b). The mediation model predicting academic sense of belong revealed a significant relationship between impostorism and negative academic help-seeking attitudes while controlling for GPA and sample (path a: $b = .96$, $SE = .04$, $p < .0001$) and between negative academic help-seeking attitudes and academic sense of belonging while controlling for GPA, sample, and impostorism (path b: $b = -.08$, $SE = .02$,

$p < .0001$). Supporting Hypothesis 3a, negative academic help-seeking attitudes were found to mediate the effects of impostorism on academic sense of belonging (path ab: $b = -.07$, $SE = .02$, 95% CI: $-.1102$ to $-.0369$). The direct effect of impostorism on academic sense of belonging was also significant (path c': $b = -0.11$, $SE = 0.04$, 95% CI: -0.1890 to -0.0333), indicating a partial mediation effect of academic help-seeking attitudes.

Similarly, supporting Hypothesis 3b, negative academic help-seeking attitudes were found to mediate the effect of impostorism on college completion intention as shown by a significant indirect effect (path ab: $b = -.05$, $SE = .02$, 95% CI: $-.0841$ to $-.0248$). The mediation analysis also demonstrated a significant relationship between impostorism and negative academic help-seeking attitudes while controlling for GPA and sample (path a: $b = .95$, $SE = .04$, $p < .0001$) and between negative academic help-seeking attitudes and college completion intention while controlling for GPA, sample, and impostorism (path b: $b = -.06$, $SE = .02$, $p < .01$). The direct effect of impostorism on college completion intention was not significant (path c': $b = -0.05$, $SE = 0.04$, 95% CI: -0.1236 to 0.0298), suggesting a complete mediation effect of academic help-seeking attitudes.

3.5 Academic help-seeking behaviors mediating the effects of impostorism on academic sense of belonging (H4a) and college completion intention (H4b)

The last set of hypotheses investigated the mediating role of academic help-seeking behaviors in predicting academic sense of belonging (H4a) and college completion intention (H4b). The mediation model predicting academic sense of belonging revealed a significant relationship between impostorism and academic help-seeking avoidance behaviors while controlling for GPA and sample (path a: $b = .61$, $SE = .04$, $p < .0001$) and between academic help-seeking avoidance behaviors and academic sense of belonging while controlling for GPA, sample, and impostorism (path b: $b = -.13$, $SE = .02$, $p < .0001$). Supporting Hypothesis 4a, academic help-seeking avoidance behaviors were found to mediate the effects of impostorism on academic sense of belonging (path ab: $b = -.08$, $SE = .01$, 95% CI: $-.1056$ to $-.0534$). The direct effect of impostorism on academic sense of belonging was significant (path c': $b = -0.11$, $SE = 0.04$, 95% CI: -0.1788 to -0.0326), indicating a partial mediation effect of academic help-seeking avoidance behaviors.

Lastly, the mediation model predicting college completion intention revealed a significant relationship between impostorism and academic help-seeking avoidance behaviors while controlling for GPA and sample (path a: $b = .60$, $SE = .04$, $p < .0001$) and between academic help-seeking avoidance behaviors and college completion intention while controlling for GPA, sample, and impostorism (path b: $b = -.10$, $SE = .02$, $p < .0001$). Supporting Hypothesis 4b, academic help-seeking avoidance behaviors were found to mediate the effects of impostorism on college completion intention (path ab: $b = -.06$, $SE = .01$, 95% CI: $-.0841$ to $-.0346$). The direct effect of impostorism on college completion intention was not significant (path c': $b = -0.04$, $SE = 0.04$, 95% CI: -0.1145 to 0.0298), indicating a complete mediation effect of academic help-seeking avoidance behaviors.

4 Discussion

Impostorism, negative self-perceptions regarding one's competence, ability, and deservingness of success, has damaging effects on one's mental health as well as psychosocial variables associated with academic engagement (e.g., Clark et al., 2021; McGregor et al., 2008). Consistent with past research, findings from the present study demonstrate the negative effects of impostorism on undergraduate students' academic and psychosocial outcomes.

Findings from the present study demonstrated that impostorism is a significant predictor of negative academic help-seeking attitudes (Hypothesis 1a) and behaviors (Hypothesis 1b) even when controlling for academic performance (measured by GPA), such that individuals who experienced higher levels of impostorism reported having negative help-seeking attitudes and academic help-seeking avoidance behaviors. To our knowledge, this is the first empirical study to investigate the relationship between impostorism and academic help-seeking attitudes and behaviors. These findings demonstrate that individuals' fear of being discovered as an intellectual fraud, a core characteristic of impostorism, may hinder students from seeking the necessary academic help from their instructors. Help-seeking from instructors is not only beneficial for students' academic performance, but for various psychosocial factors related to academic engagement as frequent interactions with instructors have been shown to be associated with greater academic motivation, confidence, and satisfaction (Komarraju et al., 2010; Pascarella & Terenzini, 2005).

Results from the current study also demonstrated that impostorism predicts lower academic sense of belonging (Hypothesis 2a) as well as lower intention to complete undergraduate studies (Hypothesis 2b) even when controlling for their GPA. While the effect sizes of these regression models were small, the findings nonetheless contribute to the understanding of impostor phenomenon. These findings are consistent with past research with graduate women in STEM showing the relationship between impostorism and academic sense of belonging as well as intentions to complete graduate studies (Clark et al., 2021; Tao & Gloria, 2019). To our knowledge, the current study is the first to investigate this relationship among the undergraduate population across various fields of study.

Furthermore, the current study adds to the existing literature on the effects of impostorism by investigating the mediating mechanisms of academic help-seeking. Results from our research demonstrated that negative academic help-seeking attitudes and help-seeking avoidance behaviors independently mediate the effects of impostorism, such that individuals reporting higher levels of impostorism exhibit more negative attitudes towards academic help-seeking, which then predicts lower academic sense of belonging (Hypothesis 3a) and less intention to complete their undergraduate studies (Hypothesis 3b). Similar pattern of results was found for academic help-seeking avoidance behaviors, such that individuals reporting higher levels of impostorism reported avoiding seeking academic help, which then predicts lower academic sense of belonging (Hypothesis 4a) and less intention to complete their undergraduate studies (Hypothesis 4b).

4.1 Limitations, future directions, and practical implications

The findings from the current study should be interpreted with limitations in mind. Although the current study had a large sample recruited from two universities in the U.S.,

generalizability of the findings may still be limited. Future studies should consider replicating the findings in other student populations, including two-year community college students and graduate students, whose demographic characteristics and academic experiences likely differ from the current sample. Given that both of the universities studied are located in the U.S., the current study should be replicated in other countries and cultures. Additionally, due to the cross-sectional nature of the study, we need to be cautious in making causal inferences. Longitudinal research should be conducted to strengthen the causal associations among impostorism, academic help-seeking attitudes and behaviors, and academic outcomes. Ultimately, intervention studies could be developed to explore the possible causal nature between our variables of interest such as impostorism and academic outcomes.

Despite the limitations, the study findings from the current study highlight the detrimental effects of impostorism on academic help-seeking attitudes and behaviors as well as academic sense of belonging and college completion intention. Universities should consider including group discussion sessions in first-year orientation to encourage students to discuss their experiences of impostorism as discussing impostor experiences with others has been identified as a coping strategy (Baumann et al., 2020; Clance & Imes, 1978). Universities should also consider dedicating more resources to help change students' attitudes toward help-seeking and making it easier for students to seek academic help. Lastly, universities can promote academic help-seeking as a norm throughout the campus and within each classroom. For example, generic language could be added to syllabi to encourage and empower students to seek help (i.e., if they have questions, if they are struggling) and provide resources on how to do so. Similar to the research on targeting misperceptions of student behavior (Neighbors et al., 2004), universities and faculty could provide data on the number of students who do seek help to challenge perceived norms.

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