



# The imposter phenomenon and its relationship with self-efficacy, perfectionism and happiness in university students

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Accepted: 12 April 2023  
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## Abstract

Individuals who experience the *imposter phenomenon* (IP) have feelings of self-doubt and are concerned that they will be exposed as frauds. Previous research has indicated that IP is associated with anxiety, depression and low self-esteem, and university students are thought to be particularly susceptible to IP. This study investigated the relationship between IP and self-efficacy, maladaptive perfectionism and happiness in university students, and examined whether these variables differ between females and males. The study also examined whether IP was associated with belonging and perceived levels of academic competition. Participants ( $N=261$ ) completed the *Clance Imposter Phenomenon Scale* (CIPS), *New General Self-Efficacy* (NGSE), *Big Three Perfectionism Scale – Short Form* (BTPS-SF), *Oxford Happiness Questionnaire* (OHQ), plus measures of belonging and perceived competition. As predicted, CIPS scores correlated negatively with NGSE and OHQ and positively with BTPS-SF in both sexes. Females scored higher, on average, than males on CIPS and BTPS-SF, and the gender difference in CIPS remained after indirect effects of perfectionism were removed. Neither belonging nor competition correlated with CIPS scores. The negative relationship between perfectionism and happiness was fully mediated by imposterism, which suggests that designing interventions that reduce IP could positively enhance student wellbeing.

**Keywords** Imposter syndrome · Fraudulence · Sex difference · Perfectionism · Self-efficacy · Happiness

## Introduction

The *imposter phenomenon* (IP) is defined as having regular feelings of self-doubt, or of being a fraud, particularly in relation to one's intellectual or academic achievements (Clance & Imes, 1978). People experiencing IP can struggle to internalise their successes and often attribute their achievements to external factors, such as luck or good fortune, and individuals who score high on questionnaire measures of IP are also more likely to experience anxiety, depression and low self-esteem (e.g., Rohrmann et al., 2016; Schubert & Bowker, 2019; Wang et al., 2019). University students might be particularly susceptible to experiencing IP, given the focus on academic performance and the competitive nature of higher education, and researchers have therefore suggested that student mental health could be improved

by IP interventions (Wang et al., 2019). Designing interventions to tackle IP will be aided by a better understanding of how IP relates to other psychological constructs and contextual variables.

In university students, individuals who score high on IP do not generally differ in their academic grades from those who score low on IP (e.g., Gibson-Beverly & Schwartz, 2008; Yaffe, 2021). These findings suggest that IP feelings are not restricted to those who are underperforming. University students with high IP scores are, however, more likely to experience academic test anxiety and have lower expectations about their future achievements (e.g., Cusack et al., 2013; Ross et al., 2001). Thus, IP scores are predicted to correlate negatively with *self-efficacy* (SE), defined as the beliefs that an individual holds about their ability to succeed (Bandura, 1977). SE questionnaires ask participants about their confidence in their ability to complete a task, overcome a challenge or reach a goal (Bandura, 2006), whereas IP measures focus on a lack of self-belief. As predicted, university students who have high IP scores report

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low self-efficacy, and vice versa (e.g., Jöstl et al., 2012; Tao & Gloria, 2019).

Individuals who place excessive pressure on themselves to achieve high standards are also likely to be at risk of experiencing IP (Thompson et al., 2000). In support of this idea, IP scores have been found to correlate positively with levels of *perfectionism* (e.g., Cusack et al., 2013; Thompson et al., 2000), which is defined as having an excessively high set of personal standards and showing overly critical self-evaluation. More specifically, IP scores correlate positively with maladaptive dimensions of perfectionism, that is, those aspects that are considered to be detrimental to mental health and academic performance (such as concern over mistakes), but not with positive aspects of perfectionism (such as perfectionistic striving) (e.g., Cusack et al., 2013; Pannhausen et al., 2022; Rohrmann et al., 2016; Thompson et al., 2000). As expected, SE correlates with perfectionism in the opposite direction to IP (i.e., SE correlates negatively with maladaptive aspects of perfectionism; e.g., Stricker & Preckel, 2022).

Women have been predicted to be more likely than men to experience IP (Clance & Imes, 1978), given the evidence for gender differences in related measures, such as self-esteem (e.g., Zuckerman et al., 2016). However, only around half of the published studies with relevant data report gender differences in average IP scores (reviewed by Bravata et al., 2020). The inconsistencies in the current literature might be explained by gender differences only emerging when the specific social context signals that women should feel like imposters, such as when women are in the minority or are disadvantaged within a particular setting (Feenstra et al., 2020). A study by Cokley et al. (2015) reported that those individuals who are most aware of gender stereotypes are most likely to experience IP, which is consistent with the idea that stereotype threat can elicit IP. More generally, the experience of being in any minority group may increase the likelihood of experiencing IP (Bernard & Neblett, 2018).

The extent to which students feel a sense of *belonging* within a higher education institution could influence their likelihood of experiencing IP. Belonging has been shown to impact upon several aspects of student engagement and wellbeing (e.g., Pittman and Richmond, 2008; Yildirim et al., 2021), and interventions that enhance belonging during the transition into university have beneficial effects on retention, academic performance and life satisfaction (e.g., Brady et al., 2020; Walton & Cohen, 2011). In addition, students who are enrolled on courses with *academic competitiveness* are reported to be particularly susceptible to experiencing IP (Canning et al., 2020; Cohen & McConnell, 2019;). Thus, the levels of IP and belonging could potentially vary between students within a single institution, depending upon the perceived academic culture within the discipline. Enhancing student belonging and reducing overt

competitiveness could therefore potentially reduce IP and increase general wellbeing.

The aim of this study was to gain a deeper understanding of IP in university students by examining its relationship with perfectionism, self-efficacy, belonging, perceived competition and happiness. More specifically, our objective was to examine whether scores on a questionnaire measure of IP are i) negatively correlated with self-efficacy and ii) positively correlated with maladaptive aspects of perfectionism, as previously reported (e.g., Jöstl et al., 2012; Rohrmann et al., 2016). Our next objective was to examine whether IP is iii) negatively correlated with happiness, given that IP has been linked with negative affect (e.g., Thompson et al., 2000). We also included a measure of belonging that was derived from a three-factor model of social identity (Cameron, 2004), and we tested the prediction that iv) individuals who expressed a lack of belonging would also experience IP. Finally, we predicted that v) those students who perceived high levels of competition within their discipline would also score high on IP. We also examined gender differences across all measures and used mediation analyses to further probe the relationships between variables.

## Methods

### Participants

The participants in this study were 261 university students (128 females, 133 males), who were recruited either via the Prolific platform ([www.prolific.co](http://www.prolific.co)) or via convenience sampling at the researchers' home institution. The data from an additional 7 individuals were removed prior to analysis, as they selected a gender category other than 'female' or 'male'. The majority of the participants were aged between 18 and 22 years (18–22 years age bracket = 92 females, 95 males; 23–28 years = 33 females, 25 males; 29–34 years = 2 females, 7 males; 35–40 years = 1 females, 2 males; 41+ years = 3 males). All participants reported being currently enrolled in a university or college, and the majority of participants were undergraduates (79% undergraduate; 20% postgraduate; 1% other). Around 60% of the participants were studying science, technology, engineering and mathematics (STEM) subjects (e.g., engineering, computer science, psychology;  $N = 155$ ; 66 females, 89 males), and the rest were studying non-STEM subjects (e.g., law, languages, social sciences;  $N = 106$ ; 62 females, 44 males). The majority of participants indicated that they were attending a university in Europe (67%), with the UK, Portugal and Poland having the highest numbers of respondents; participants studying in the USA, Mexico and South Africa made up the majority of the remaining participants (27%).

## Measures

### Imposter phenomenon

The *Clance Imposter Phenomenon Scale* (CIPS; Clance, 1985) consists of 20 items (e.g., ‘I’m afraid people important to me may find out that I’m not as capable as they think I am’). Participants indicate how true the statement is for themselves on a 5-point Likert scale (1 = ‘Never or almost never’, 5 = ‘Very often’). As the items have been shown to conform to a single factor model (Simon & Choi, 2018), responses are combined into a total score; accordingly, scores could range from 20 to 100. The scale has demonstrated satisfactory internal consistency and reliability (e.g., French et al., 2008; Cronbach’s  $\alpha$  in current study = 0.895).

### Self-efficacy

The *New General Self-Efficacy* scale (NGSE; Chen et al., 2001) consists of 8 items (e.g., ‘When facing difficult tasks, I am certain that I will accomplish them’) that are rated on a 5-point Likert scale (1 = ‘Strongly disagree’, 5 = ‘Strongly agree’). The measure has a unidimensional structure (Chen et al., 2001), and responses are combined into a total score; scores could range from 8 to 40. The scale has demonstrated satisfactory internal consistency and reliability (e.g., Scherbaum et al., 2006; Cronbach’s  $\alpha$  in current study = 0.903).

### Perfectionism

The *Big Three Perfectionism Scale – Short Form* (BTPS-SF; Feher et al., 2020) consists of 16 items (e.g., ‘It is important to me to be perfect in everything I attempt’) that are rated on a 5-point Likert scale (1 = ‘Strongly disagree’, 5 = ‘Strongly agree’). The BTPS-SF is made up of three primary factors (rigid, self-critical and narcissistic perfectionism), and responses are combined into a total score; accordingly, scores could range from 16 to 80. The scale has demonstrated satisfactory internal consistency and reliability (e.g., Kaçar-Başaran et al., 2022; Cronbach’s  $\alpha$  in current study = 0.875).

### Happiness

The *Oxford Happiness Questionnaire* (OHQ; Hills & Argyle, 2002) consists of 8 items (e.g., ‘I feel that life is very rewarding’). For consistency with the other measures, participants responded on a 5-point Likert scale (1 = ‘Strongly disagree’, 5 = ‘Strongly agree’), and total scores could range from 8 to 40. The scale has a unidimensional structure (Hills

& Argyle, 2002) and has demonstrated satisfactory internal consistency and reliability (e.g., Özdemir et al., 2020; Cronbach’s  $\alpha$  in current study = 0.782).

### Belonging

Belonging was measured by devising a set of institution-related social identification questions (based on Cameron, 2004). The 5 items covered i) ingroup ties (e.g., ‘I have a lot in common with other students in [my university/college]’), ii) centrality (‘Being a student in [my university/college] is important to me’), and iii) ingroup affect (e.g., ‘I think that students in [my university/college] have a lot to be proud of’). Participants were asked to state the name of their university/college, and answers to this question were embedded into the statements. Participants responded on a 5-point scale (1 = ‘Strongly disagree’, 5 = ‘Strongly agree’), and total scores could range from 5 to 25 (Cronbach’s alpha in current study = 0.689).

### Perceived competition

Participants completed two items about perceived academic competition (based on reworded items from Canning et al., 2020): ‘Students tend to be very competitive with each other in [participant degree subject]’ and ‘I think that [participant degree subject] is a very competitive subject to get in to at university/college’ (where the participant’s own response about their degree subject was inserted into the statements). Participants responded using a 5-point Likert scale (1 = ‘Strongly disagree’, 5 = ‘Strongly agree’), and total scores could range from 2 to 10 (Cronbach’s alpha in current study = 0.712).

### Procedure

The study was administered using the Qualtrics software platform. Participants provided informed consent and then completed the CIPS, NGSE, BTPS-SF and OHQ (in randomised order). After being asked to report their gender and age category and confirming that they were currently studying at university/college, participants were asked which institution they attend and which subject they are studying. Participants then answered the belonging and academic competition questions. After completing the survey, participants were debriefed and provided with the opportunity to enter a monetary prize draw or directed back to Prolific for recompense.

## Statistical analyses

The analyses were conducted in SPSS (v28). The questionnaire data were reversed coded where required, and total scores were calculated for all measures. All data derived from Likert scales were treated as continuous, and parametric statistics were used throughout, as the data conformed to the assumptions of parametric tests (skewness, kurtosis and Shapiro-Wilks' normality tests on residuals). The SPSS macro 'PROCESS' (Model 4; Hayes & Preacher, 2014) was used to conduct the mediation analyses; the mean of the 95% confidence intervals (CI) of the indirect effect was derived from 10,000 bootstrap samples and was concluded to be present if the upper and lower bounds of the CI did not include zero.

## Results

### Descriptive statistics

The mean scores for all of the questionnaires, plus all of the bivariate relationships, are presented in Table 1 for females and males separately. On average, females scored higher than males on both the CIPS ( $F_{1,259} = 11.513, p < 0.001$ ) and BTPS-SF ( $F_{1,259} = 7.008, p < 0.01$ ) (Fig. 1). No sex differences were found on the NGSE ( $F_{1,259} = 2.067, n.s.$ ), OHQ ( $F_{1,259} = 0.002, n.s.$ ), Belonging scale ( $F_{1,259} = 2769, n.s.$ ) or Competitiveness scale ( $F_{1,259} = 1.550, n.s.$ ).

In both sexes, CIPS scores were positively correlated with BTPS-SF scores (females:  $r = 0.469, p < 0.001$ ; males:  $r = 0.515, p < 0.001$ ; Fig. 2a) and negatively correlated with NGSE (females:  $r = -0.508, p < 0.001$ ; males:  $r = -0.504, p < 0.001$ ; Fig. 2b) and OHQ scores (females:  $r = -0.614, p < 0.001$ ; males:  $r = -0.563, p < 0.001$ ; Fig. 2c). In addition, in both sexes, OHQ correlated negatively with BTPS-SF (females:  $r = -0.370, p < 0.001$ ; males:  $r = -0.267, p < 0.001$ ) and positively with NGSE (females:  $r = 0.601, p < 0.001$ ).

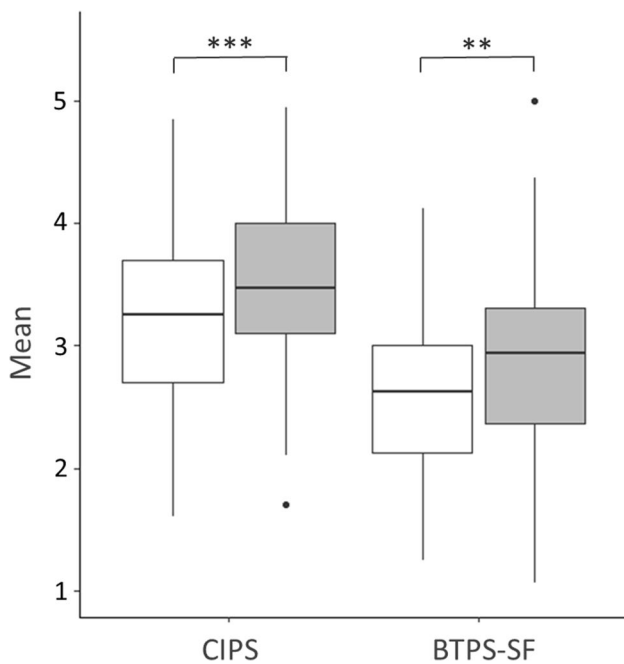
**Table 1** Means, SEMs and Pearson's correlations for all variables in a) females ( $N = 128$ ), and b) males ( $N = 133$ ) (\*\* $p < 0.01$ , \*\*\* $p < 0.001$ , \* $p < 0.05$ )

#### a) Females

	Mean	SEM ( $\pm$ )	1. CIPS	2. NGSE	3. BTPS-SF	4. OHQ	5. Belong.
1. CIPS	3.47	0.06					
2. NGSE	3.53	0.06	-0.508***				
3. BTPS-SF	2.82	0.06	0.469***	-0.214*			
3. OHQ	3.26	0.06	-0.614***	0.601***	-0.370***		
5. Belonging	3.84	0.06	-0.145	0.152	-0.016	0.256**	
6. Competitiveness	3.36	0.10	-0.116	0.137	0.020	0.181*	0.103

#### b) Males

	Mean	SEM ( $\pm$ )	1. CIPS	2. NGSE	3. BTPS-SF	4. OHQ	5. Belong.
1. CIPS	3.19	0.06					
2. NGSE	3.66	0.06	-0.504***				
3. BTPS-SF	2.61	0.06	0.515***	-0.169			
4. OHQ	3.26	0.06	-0.563***	0.582***	-0.267***		
5. Belonging	3.70	0.06	-0.127	0.254**	-0.047	0.042	
6. Competitiveness	3.18	0.10	-0.102	0.260***	0.081	0.065	0.141



**Fig. 1** Boxplots show means, medians and interquartile ranges on CIPS and BTPS-SF for females (grey) and males (white). \*\*\*= $p < 0.001$ ; \*\*= $p < 0.01$

$p < 0.001$ ; males:  $r = 0.582$ ,  $p < 0.001$ ). BTPS-SF and NGSE were negatively correlated in females ( $r = -0.214$ ,  $p < 0.05$ ) but not in males ( $r = -0.169$ , n.s.). In females only, OHQ positively correlated with the Belonging ( $r = 0.256$ ,  $p < 0.01$ ) and Competitiveness scales ( $r = 0.181$ ,  $p < 0.05$ ), whereas, in males only, NGSE positively correlated with Belonging ( $r = 0.254$ ,  $p < 0.01$ ) and Competitiveness ( $r = 0.260$ ,  $p < 0.001$ ).

### Regression models

Given that sex differences were found in the CIPS and BTPS-SF scores, separate regression models are presented for each sex. For females, the overall regression model was significant ( $R^2 = 0.477$ ;  $F_{5,122} = 22.215$ ,  $p < 0.001$ ), and CIPS scores were significantly predicted by BTPS-SF ( $\beta = 0.285$ ,  $t = 4.023$ ,  $p < 0.001$ ), NGSE ( $\beta = -0.221$ ,  $t = -2.695$ ,  $p < 0.01$ ) and OHS ( $\beta = -0.368$ ,  $t = -4.124$ ,  $p < 0.001$ ). CIPS scores were not predicted by Belonging ( $\beta = -0.010$ ,  $t = -0.144$ , n.s.) or Competitiveness ( $\beta = -0.024$ ,  $t = -0.358$ , n.s.).

For males, the overall regression model was significant ( $R^2 = 0.508$ ;  $F_{5,127} = 26.212$ ,  $p < 0.001$ ), and CIPS scores were significantly predicted by BTPS-SF ( $\beta = 0.394$ ,  $t = 6.048$ ,  $p < 0.001$ ), NGSE ( $\beta = -0.231$ ,  $t = -2.808$ ,  $p < 0.01$ ) and OHS ( $\beta = -0.319$ ,  $t = -4.023$ ,  $p < 0.001$ ). CIPS scores were not predicted by Belonging ( $\beta = -0.029$ ,

$t = -0.447$ , n.s.) or Competitiveness ( $\beta = -0.049$ ,  $t = -0.748$ , n.s.).

### Mediation analyses

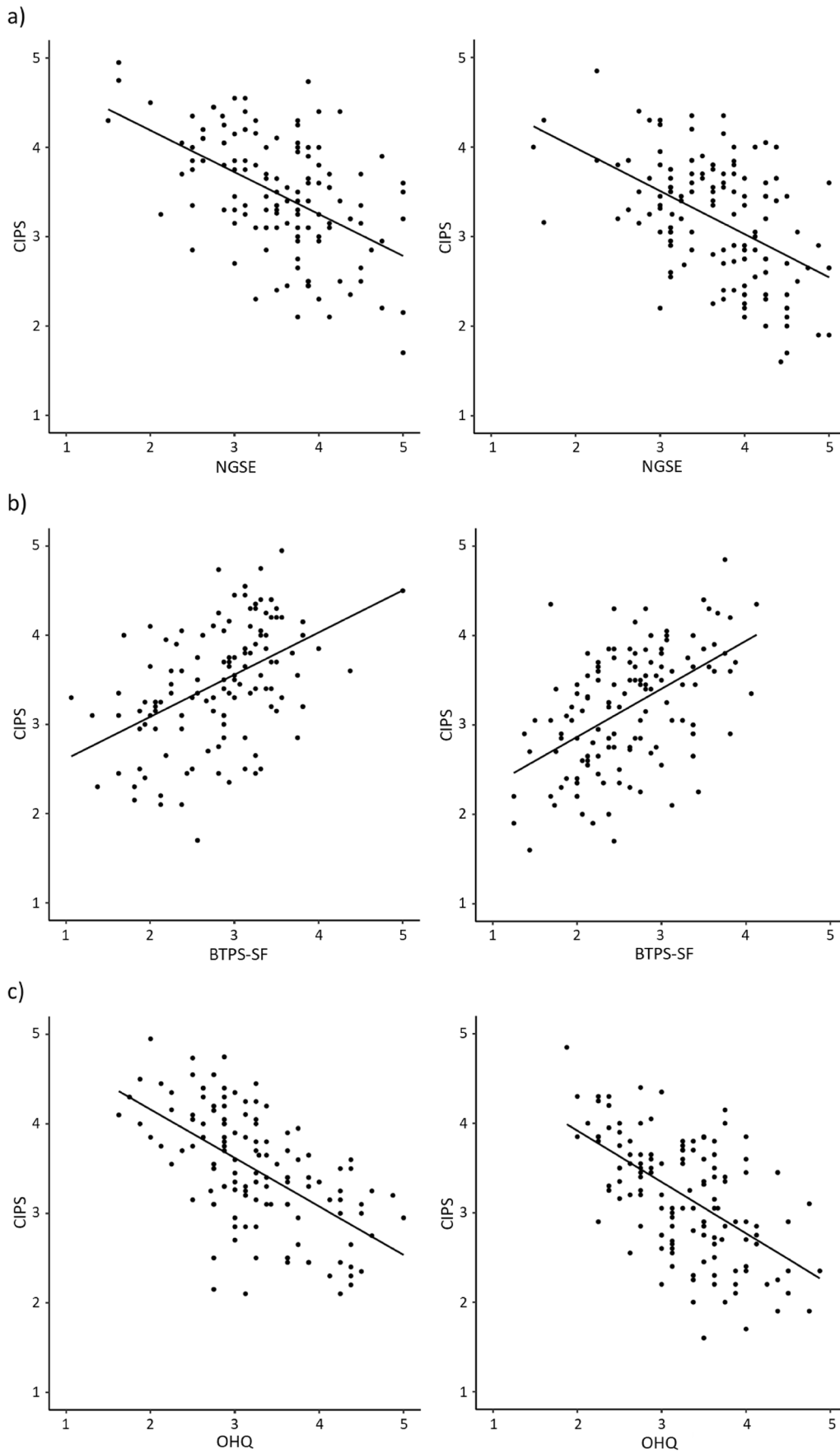
First, we examined the potential indirect effects of perfectionism on the gender difference in IP scores (Fig. 3a). The bootstrapping results indicated that perfectionism partially mediated the link between gender and IP (indirect effect = 0.1079, SE = 0.0427, 95% CI (0.0293, 0.1971)). The direct effect of gender on IP remained significant (direct effect = 0.1730, SE = 0.0732,  $t = 2.3647$ ,  $p = 0.0188$ ), and gender explained around 60% of the overall effect (total effect = 0.2809, SE = 0.0828,  $t = 3.3930$ ,  $p < 0.001$ ). Thus, the gender difference in IP scores remained significant after taking into account the gender difference in perfectionism.

Second, we examined the potential indirect effects of perfectionism on the relationship between IP and self-efficacy (Fig. 3b). The bootstrapping results (with gender included as a covariate) indicated that perfectionism did not mediate the link between IP and self-efficacy (indirect effect = 0.0396, SE = 0.0360, 95% CI (-0.0288, 0.1133)). The direct link between IP and NGSE remained significant (direct effect = -0.5781, SE = 0.0656,  $t = -8.8112$ ,  $p < 0.001$ ; total effect = -0.5385, SE = 0.572,  $t = -9.400$ ,  $p < 0.001$ ). Thus, although IP was correlated with both perfectionism and self-efficacy, the relationship between IP and self-efficacy was independent from the relationship between IP and perfectionism.

Third, we examined whether IP mediates the relationship between perfectionism and self-reported happiness (Fig. 3c). The bootstrapping results (with gender included as a covariate) indicated that IP fully mediated the link between perfectionism and happiness (indirect effect = -0.2975, SE = 0.0445, 95% CI (-0.3891, -0.2146)). The direct link between perfectionism and happiness was not significant (direct effect = -0.0446, SE = 0.0616,  $t = -0.7244$ , n.s.; total effect = -0.3421, SE = 0.0627,  $t = -5.4534$ ,  $p < 0.001$ ).

### Discussion

The aim of this study was to investigate the relationships between imposter phenomenon (IP), self-efficacy, perfectionism, happiness, belonging and perceived competition in university students, and to examine whether these variables differed between the sexes. As predicted, IP was negatively correlated with self-efficacy and happiness, and positively correlated with perfectionism, in both sexes. Women scored higher on average than men on both IP and perfectionism, and gender differences in IP were present when perfectionism scores were taken into account, which suggests that the





**Fig. 2** Correlations between CIPS and **a**) NGSE, **b**) BTPS-SF and **c**) OHQ for females (left-hand panels) and males (right-hand panels)

propensity for women to experience IP is not solely related to perfectionistic tendencies. Contrary to predictions, IP was not related to participant's sense of belonging at their institution nor perceived academic competition. Given that, in both sexes, IP fully mediated the link between perfectionism and happiness, these findings suggest that reducing IP could have a positive impact on wellbeing in student populations. Below, we compare each of the findings to the previous literature and discuss the implications for further understanding the imposter phenomenon.

IP was negatively correlated with general self-efficacy in both sexes, as reported previously (e.g., Jöstl et al., 2012; Tao & Gloria, 2019). Thus, individuals who had lower confidence in their own abilities had higher IP. Self-efficacy and perfectionism were not strongly related to each other, and the mediation analyses indicated that the relationship between IP and self-efficacy remained when perfectionism was taken into account, which suggests that low levels of self-efficacy and high levels of perfectionism independently relate to IP. Given that self-efficacy correlates with academic persistence and commitment to completing a degree programme (Tao & Gloria, 2019), reducing feelings of IP in university students might positively impact academic success via enhanced self-efficacy. However, as the causal links between these variables are unclear, longitudinal studies are required to shed light on the directionality of the relationship between IP and self-efficacy.

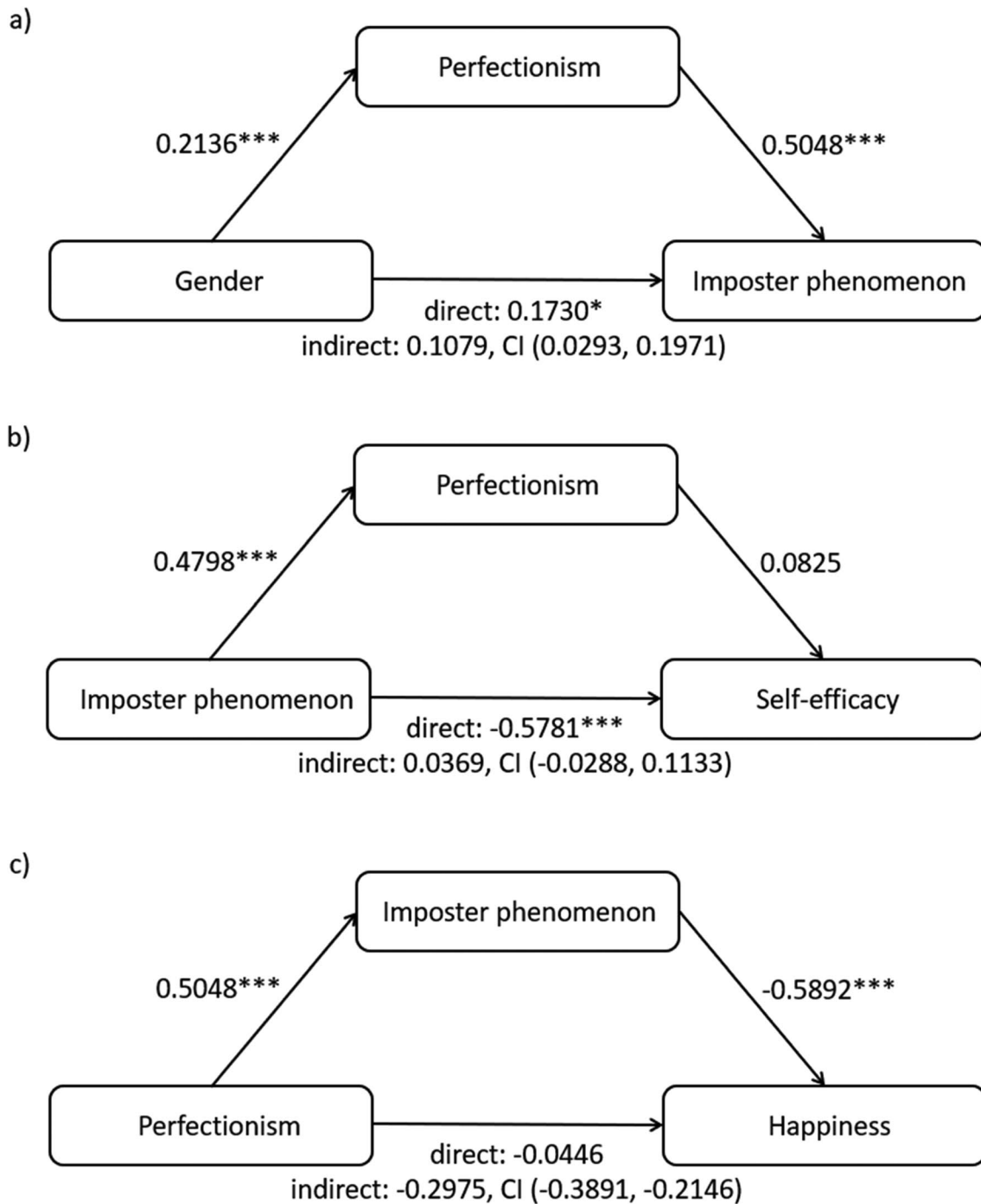
Our finding that, on average, women scored higher than men on IP is consistent with several previous studies (e.g., Cusack et al., 2013; Jöstl et al., 2012; Muradoglu et al., 2021), although gender differences in IP are not always found (reviewed by Bravata et al., 2020). Women also scored higher on average than men on maladaptive perfectionism. Previous studies have not tended to find gender differences in perfectionism levels (e.g., Pannhausen et al., 2022); however, Haas et al. (2013) argued that gender differences in perfectionism are domain-specific, with females showing higher levels of perfectionism than males particularly in the domain of 'university/work'. Gender differences in perfectionism are therefore likely to vary between groups and might be particularly prominent among university students, as in the current study. Future research could investigate the potential causal relationships between exposure to gender discrimination and the development of both perfectionism and imposterism tendencies in female students.

Our finding that self-reported happiness was negatively correlated with IP scores provides novel evidence that IP could have a detrimental impact on positive affect. This finding complements previous studies that have linked IP with increased negative affect (e.g., Thompson et al., 2000;

Rohrman et al., 2016). Self-reported happiness also correlated negatively with perfectionism and positively with self-efficacy, in line with previous studies (e.g., Abdollahi et al., 2019; van Zyl & Dhurup, 2018), and IP fully mediated the link between perfectionism and happiness. Wang et al. (2019) similarly showed that IP fully mediates the link between perfectionism and anxiety. Collectively, these findings suggest that interventions to reduce IP could have positive impacts on wellbeing by reducing the negative impacts of perfectionistic tendencies and enhancing happiness. Increased happiness could then potentially lead to improvements in academic and social engagement (Boulton et al., 2019). However, given that the participants in the study were mostly students studying at European universities, one caveat is that the findings might not be generalisable to broader populations.

In this study, scores on the belonging measure did not correlate with IP. This finding contrasts with recent evidence of a negative correlation between IP and belonging in early career researchers and faculty in the USA (Muradoglu et al., 2021). This difference might result from the study populations, with later stage academics perhaps reporting a more variable (and an overall more negative) sense of belonging than undergraduate students. In the current study, self-efficacy positively correlated with belonging in male students, which could result from self-confidence enhancing a sense of belonging or, alternatively, belonging could have a positive impact on academic performance, which could then reduce IP. In women, belonging positively correlated with happiness instead of self-efficacy, which could either reflect feelings of belonging increasing happiness or could reflect low happiness leading to feelings of detachment. Further studies are required to investigate the link between belonging and IP, and a larger sample size than in the current study might be required to tease apart such relationships.

Although high levels of perceived competition within the discipline were expected to be associated with high IP levels, competition scores did not correlate with IP scores for either males or females. Previous studies that have reported a relationship between IP and competition focused on classroom-based competition (Canning et al., 2020; Cohen & McConnell, 2019), whereas the current study asked about perceived competition in the academic subject area. Similar to the belonging measure, perceived competition correlated instead with self-efficacy in men and happiness in women. Those men who reported higher levels of perceived competition had higher levels of self-efficacy, which perhaps reflects a general confidence about their ability to succeed in a competitive environment. Women who reported higher levels of perceived competition reported somewhat higher levels of happiness, and, although the effect was small, this finding deserves further investigation across a range of student groups.



**Fig. 3** Mediation models examining **a)** the mediating effect of perfectionism on the gender difference in IP; **b)** the mediating effect of perfectionism on the relationship between IP and self-efficacy; and **c)** the

mediating effect of IP on the relationship between perfectionism and happiness. \*\*\* =  $p < 0.001$ ; \* =  $p < 0.05$

In summary, feelings of imposterism were associated with lower self-efficacy, higher maladaptive perfectionism and lower levels of happiness, which can potentially translate into low academic engagement and progress in university students. The growing evidence that female students are more likely than male students to experience IP suggests

that gender stereotypes could increase the likelihood that women will question their abilities within academic settings. Although IP was not associated with belonging or perceived competition, indirect links between IP and belonging may occur via self-efficacy and happiness. Designing interventions to reduce IP and alleviate the negative impacts of



maladaptive perfectionism, in particular, is likely to have a positive impact on academic performance and wellbeing in some students. At the same time, higher education institutions should work towards removing structural and cultural barriers that prompt individuals to feel that they are unlikely to succeed.

**Acknowledgements** The study was funded by the University of St Andrews, UK. We are grateful to the reviewers for the constructive feedback.

**Authors' contributions** All authors contributed to the study conception and design. CP, JA, JD and PG collected the data. CP and GB analysed the data, and GB drafted the manuscript. All authors read and approved the final manuscript.

**Data availability** The study was not preregistered. The data are available open access at <https://doi.org/10.17630/f93ea09a-e913-44f9-9214-9559b6238ea0>.

## Declarations

**Ethical approval** The study received ethical approval from the Ethics Committee of the School of Psychology & Neuroscience, University of St Andrews, UK, and all participants provided informed consent.

**Competing interests** The authors have no relevant financial or non-financial interests to disclose.

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