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A meta-analysis of multidimensional perfectionism and impostor phenomenon

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ABSTRACT

A meta-analysis is provided to disentangle the relationship between perfectionism and impostor phenomenon. Following a preregistered protocol, a systematic search provided 25 studies (N = 12,141) and 42 effect sizes. Perfectionistic strivings had a small positive relationship with impostor phenomenon (r^{+}=.15[.07, 0.23]) and perfectionistic concerns had a large positive relationship with impostor phenomenon (r^{+}=.61[.55, 0.65]). In turn, perfectionistic concerns made a substantially larger contribution to the overall effect of perfectionism ($\beta_{PS} + \beta_{PC} = 0.57$[.54, 0.60]). There was also evidence that the relationship with perfectionistic concerns was larger in studies with more females. The overlap between perfectionism and impostor phenomenon appears to relate mainly to a need to appear perfect to others. Future research should examine their development and mediating and moderating factors.

1. Introduction

Perfectionism and impostor phenomenon are distinct constructs that show considerable similarity (Thompson et al., 2000). Both are thought to be surprisingly common, considered especially pervasive in achievement contexts, and are associated with irrational expectations for performance (Bravata et al., 2019; Curran & Hill, 2019; Kets de Vries, 2005). In addition, while both have been linked to high achievement, they are also known to come at considerable cost to mental health (Blondeau, 2024; Limburg et al., 2017; Madigan, 2019). In recognition of these similarities, many studies have empirically examined the relationship between perfectionism and impostor phenomenon. To date, though, no attempt has been made to systematically pool studies, estimate the aggregate size and significance of the relationship, or identify moderating factors. This study addressed these issues by conducting the first meta-analysis of the relationship between impostor phenomenon and perfectionism. In doing so, we utilize recent advances in the conceptualization, structure, and analysis of perfectionism to better understand their relationship.

1.1. Impostor phenomenon and perfectionism

Impostor phenomenon is a pattern of thinking, feeling, and behaving that revolves around an intense, pervasive, and persistent belief that one is a fraud (Clance, 1985; Clance & Imes, 1978). Individuals experiencing this phenomenon chronically worry that their abilities have been overestimated by others, that their inherent incompetence will ultimately be discovered, and that they will be exposed as a phony, fake, or impostor (Sakulku & Alexander, 2011). These worries are thought to play a role in motivating an intense work ethic for some individuals that can result in considerable personal achievement. However, such achievements are not internalized (Thompson et al., 1998). Rather, instead of attributing personal success to skill or ability, it is deemed to be the result of luck, effort, or beneficial external circumstances. As a result, individuals experiencing impostor phenomenon view their success, no matter how justified, to be undeserved (Lane, 2015).

Impostor phenomenon may lead to behaviours reflective of perfectionism to battle these feelings (Kets de Vries, 2005). Perfectionism is a personality trait that entails the tendencies to endorse and pursue excessively high standards in a manner that is overly stringent, self-critical, and implicative of self-worth (Frost et al., 1990). Factor analytic examinations of self-report perfectionism measures suggest that the

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trait encompasses two related, yet distinct, dimensions (e.g., Cox et al., 2002). One dimension—labelled perfectionistic strivings (PS)—represents an internalized pressure to pursue perfection and is manifested by extremely high personal standards, unrelenting self-oriented pressure, and strivings for flawlessness. The second dimension—labelled perfectionistic concerns (PC)—represents an irrational overconcern about imperfection and is manifested by chronic perceptions of discrepancy between actual and desired performance, socially-prescribed pressure, concerns over mistakes, and negative reactions to imperfection.

There is considerable overlap in the core characteristics, behaviours, and outcomes of impostor phenomenon and perfectionism (Pannhausen et al., 2022; Garba et al., 2024). Indeed, perfectionism has been described as a "dominant theme" (Thompson et al., 2000, p. 631) within the impostor phenomenon literature. The conceptual overlap is evident in that both constructs are associated with fear of failure, social evaluation, and rejection (Grubb & Grubb, 2021; Hewitt & Flett, 1991; Kets de Vries, 2005); both can fuel chronic performance dissatisfaction, overwork, and hypervigilance (Gotwals & Tamminen, 2022; Grubb & Grubb, 2021; Pannhausen et al., 2022); and, as a result, both have been identified as risk factors for psychopathology (Bravata et al., 2019; Garba et al., 2024; Limburg et al., 2017). However, authors have also recognized important distinctions between them, including different origins (external vs. internal factors; Ojeda, 2024), motives (intellectual phoniness vs. personal standards; Cokley et al., 2018), and self-presentation strategies (claimed self-handicapping vs. perfectionistic self-presentation; Ferrari & Thompson, 2006).

Such conceptual similarities and differences have led to a proliferation of studies examining the relationship between impostor phenomenon and perfectionism. These studies differ across a number of characteristics, including sample demographics (e.g., age and gender), context (e.g., school vs. work), instrumentation, and—most important—findings. Correlations reported in studies of impostor phenomenon and PS, for example, range from small and negative (e.g., Wang et al., 2019), to negligeable (e.g., Sheveleva et al., 2023), to moderate and positive (e.g., Liu, Han et al., 2023). As such, it is unclear to what degree PS is related to impostor phenomenon. Indeed, the distinction between PS and PC is not always apparent in research in this area despite its importance (Pannhausen et al., 2022). This situation adds to conceptual confusion regarding perfectionism and impostor phenomenon and inhibits researchers who want to extend understanding of the relationship and practitioners who encounter them among their clientele.

1.2. Meta-Analysis

Meta-analysis is well-suited to resolving uncertainty regarding the relationship between perfectionism and impostor phenomenon. Meta-analysis is a statistical technique designed to aggregate effects across studies. By applying it to findings across studies, it can provide an overall estimate of the size, significance, and precision of the impostor phenomenon–perfectionism relationship. In doing so, both the overall, or net, effect of perfectionism can be determined along with estimates of the individual relations with PS and PC and, importantly, their relative contributions (Hill et al., 2021). Meta-analysis has become a popular technique in research on perfectionism (e.g., Limburg et al., 2017) and in research on impostor phenomenon (e.g., Price et al., 2024). However, as yet, no meta-analysis has been published examining the relationships between the two characteristics.

Meta-analysis also provides the opportunity to test whether aggregated relationships are moderated by sample and study characteristics. Regarding sample characteristics, gender shows promise as a moderator of the impostor phenomenon–perfectionism relationship. As summarized by Rackley et al. (2024), there is consistent evidence that relationships involving impostor phenomenon vary by gender (e.g., impostor phenomenon is positively related to GPA among females but not males; King & Cooley, 1995). Similarly, some meta-analytical evidence suggests that relationships between perfectionism and personality factors depend on gender (e.g., PS is more strongly related to neuroticism in samples that include more females; Smith et al., 2019). As such, we might also expect the meta-analytic relationship between impostor phenomenon and perfectionism to be dependent on gender. Given that both impostor phenomenon and perfectionism are salient across the lifespan, can be domain-specific, and culturally influenced, other possible moderators worthy of exploring include age, domain, and national context (Bravata et al., 2019; Pratt et al., 2024; Price et al., 2024).

Regarding study characteristics, there is reason to suspect perfectionism instrument as a potential moderator. Multiple instruments can be used to measure perfectionism with each containing subscales that reflect distinct facets of PS and PC. Reflective of their item content, different subscales may show different relationships to the same criterion variable. This has been demonstrated in a number of perfectionism meta-analyses in relation to personality, motivation, and psychopathology (e.g., Hill et al., 2018; Limburg et al., 2017; Smith et al., 2019). Accordingly, the meta-analytic relationship between multidimensional perfectionism and impostor phenomenon may also be dependent on the instrument used to represent PS or PC. In line with best practices in meta-analysis, it would be prudent to also explore methodological quality and publication status (published versus unpublished) as potential moderating study characteristics (Downes et al., 2016; Rothstein & Bushman, 2012).

One final issue relating to moderation worthy of examining is the interaction between PS and PC. The interplay between the two dimensions of perfectionism is important to their effects and examining their interaction is now a routine part of research. This type of approach is fundamental to influential models of perfectionism (e.g., Gaudreau & Thompson, 2010). Building on research of this kind, the concept of perfectionistic tipping points has recently been suggested (Hill, 2021). Perfectionistic tipping points are specific levels of PC at which the effects of PS are altered. Part of the impetus for the concept is the notion that the ambiguity associated with PS may be explained by the degree of PC. Initial evidence suggests that the concept may be useful in this regard for a range of outcomes (e.g., Waleriańczyk, 2023). A meta-analytical tipping point may, then, also prove useful for explaining differences in the findings of studies regarding PS and impostor phenomenon (e.g., PS may be positively related to impostor phenomenon only at some higher level of PC).

1.3. The present study

The overall aim of the present study was to provide the first meta-analysis of the relationship between impostor phenomenon and perfectionism. In doing so, we to sought to determine (a) the meta-analytical relationship between perfectionism (PS and PC) and impostor phenomenon; (b) whether these effects were moderated by sample characteristics (gender, age, domain, and national context/location of the study); and (c) whether there is evidence of a meta-analytical tipping point for the relationship between perfectionism and impostor phenomenon (i.e., moderation of the PS-impostor phenomenon relationship by level of PC). Our preregistered hypotheses were that both PS and PC would be positively related to impostor phenomenon. We considered hypotheses relating to moderation to be exploratory.

2. Method

2.1. Preregistration and protocol

The meta-analysis was preregistered using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol template (PRISMA-P; Moher et al., 2015) following a preliminary search of the literature to establish viability of the review (Hill & Gotwals, 2025).

PRISMA guidelines were adopted and followed throughout (Page et al., 2021). There were two deviations from the preregistered protocol. First, we supplemented examination of the effects of PS and PC with additional analysis focusing on their combined effects (Stoeber et al., 2020). Second, we prespecified measures of perfectionism and impostor phenomenon as part of the study inclusion criteria. The search, though, identified a small number of studies that used measures—or a combination of measures—that we did not prespecify. As such, we conducted a comparative sensitivity analysis that included both studies that used prespecified measures and those that did not. All other analyses are based only on studies that used prespecified measures as per the preregistered protocol.

2.2. Eligibility criteria

Studies were included if they: (a) measured perfectionism using standardised self-report instruments that yielded quantitative values; (b) measured perfectionism in a multidimensional manner (as opposed to a unidimensional one) using the following prespecified instruments and subscales (including translations, domain specific adaptations, and brief/alternate versions): Multidimensional Perfectionism Scale (Frost et al., 1990; personal standards [PS] and concern over mistakes [PC]), Multidimensional Perfectionism Scale (Hewitt & Flett, 1991; self-oriented perfectionism [PS] and socially prescribed perfectionism [PC]), Multidimensional Inventory of Perfectionism in Sport (striving for perfection [SP] and negative reactions to imperfection [PC]), Almost Perfect Scale- Revised (Slaney et al., 2001; high standards [PS] and discrepancy [PC]), Perfectionism Inventory (Hill et al., 2004; striving for excellence [PS] and concern over mistakes [PC]), and the Big Three Perfectionism Scale (Smith et al., 2016; rigid perfectionism [PS] and self-critical perfectionism [PC]). These instruments were considered the most common, valid, and reliable measures of multidimensional perfectionism and the subscales the most strongly aligned with PS and PC; (c) measured impostor phenomenon using standardised self-report instruments that yielded quantitative values using one of the following prespecified instruments (including translations, domain specific adaptations, and brief/alternate versions): Clance Impostor Phenomenon Scale (Clance, 1985), Harvey Impostor Phenomenon Scale (Harvey, 1981), Impostorism Scale (Leary et al., 2000), Perceived Fraudulence Scale (Kolligian & Sternberg, 1991), Impostor Phenomenon Assessment (Walker & Saklofske, 2023), and the Impostor Profile 30 (Ibrahim et al., 2022). Like with perfectionism, these instruments were considered the most common, valid, and reliable measures of impostor phenomenon; (d) were published in English; and (e) were published, accepted for publication, under review in a peer-reviewed journal, unpublished journal article, or a thesis/dissertation.

2.3. Search strategy

A formal search was performed with the following databases: APA PsycINFO, APA PsycARTICLES, SPORTDiscus, MEDLINE, Open-Dissertations, and ProQuest (Dissertations & Theses). Note that use of ProQuest required use of a separate search platform. Search dates were 1990 to 2025. The start of the search was selected to coincide with the publication year of the first measure of multidimensional perfectionism (i.e., Frost et al., 1990). Search terms were "perfection*" (for PERFECTIONism, PERFECTIONist, and PERFECTIONstic)" AND "impost*" (for IMPOSTor, IMPOSTer, IMPOSTorism, IMPOSTor fears, IMPOSTor phenomenon/syndrome). An additional search restriction was applied to ProQuest (psychology theses/dissertations only). The search was conducted on 21–03-25 by the first author. Reference lists of eligible studies were also inspected (backward search) by both authors. Corresponding authors of eligible studies were contacted to obtain any unpublished papers or data (contact details were not obtainable in three cases).

2.4. Screening for selection

Zotero was used to manage records and screen studies for eligibility and inclusion. Titles and abstracts were initially screened followed by full documents. This process was completed independently by both authors. Disagreements were resolved through discussion and consensus. This process led to the decision to retain studies that did not use prespecified measures of perfectionism or impostor phenomenon for use in sensitivity analyses.

2.5. Data extraction

A coding sheet was developed, trialled, and refined by the first author. Data extracted from each study were: (1) Publication information (authors/year), (2) publication type (unpublished vs published), (3) sample size, (4) domain (education, workplace, sport), (5) gender (% of female), (6) age (including mean and SD), (7) location of study (country), (8) instrument used to measure perfectionism and indicators of PS and PC, (9) instrument used to measure impostor phenomenon, (10) internal reliabilities of measures of PS, PC, and impostor phenomenon, (11) bivariate correlations between PS and PC, and (12) bivariate correlations between both PS and PC and impostor phenomenon. All information was extracted by the first author and independently checked by the second author. Disagreements were resolved through discussion and consensus.

2.6. Quality assessment

The risk of bias/methodological quality in included studies was assessed using AXIS (Downes et al., 2016). Two additional items were added when assessing studies that used longitudinal designs (see Ntoumanis et al., 2024). Assessments were competed independently by both authors with disagreements resolved through discussion and consensus.

2.7. Confidence in culminative evidence

We used GRADE (Guyatt et al., 2011) to determine certainty of the overall estimate of meta-analytical effects by considering risk of bias (AXIS score), the heterogeneity of results across studies (I2), the generalisability of the findings, imprecision of estimates (CIs) and the risk of publication bias (Egger's Intercept test, Begg and Mazumdar's test).

2.8. Meta-analysis

A meta-analysis with random-effects model was used to derive meta-analytical effects (r^{+}). These provided the size, precision (95% confidence intervals), and statistical significance ($p < 0.05$) of the relationships between PS, PC, and impostor phenomenon based on bivariate correlations. Additional estimates of meta-analytical effects were calculated correcting for measurement error (r_{ρ}^{+}; Hunter & Schmidt, 2004). To ascertain the overall effect of PS and PC, the total unique effect of perfectionism (with 95% CI and relative weights) were also calculated (Hill et al., 2021; Tonidandel & LeBreton, 2015).

Heterogeneity in the meta-analytical effects (r^{+}) were assessed using indices of heterogeneity (Q_T) and inconsistency (I^2) with evidence of moderation inferred in the presence of statistically significant heterogeneity ($p < 0.05$) and more than low levels of inconsistency (>.25, Higgins & Thompson, 2002). Subgroup analyses was used to explore moderation for categorical variables (measure of perfectionism, domain, location of study) using statistical significance of between-study variability (Q_B) and 95% CI as basis for inferring moderation. Meta-regressions were used to explore moderation for continuous variables (age, percentage of females in the sample, and level of PC) with standardized regression coefficients (β) and 95% CI as the basis for inferring moderation.

Publication bias was assessed by using funnel plots, Egger's Intercept test, Begg and Mazumdar's test, and the Trim-and-fill method (Begg & Mazumdar, 1994; Duval & Tweedie, 2000; Egger et al., 1997). Additional moderation analyses were used to examine if (i) publication status (published vs unpublished study/data) and (ii) methodological quality (AXIS score as predictor) were related to meta-analytical estimates.

Meta-Essentials (Suurmond et al., 2017) was used for the meta-analyses and web-based tools for total unique effects and relative weights (Hill, 2025; Tonidandel & LeBreton, 2015).

3. Results

3.1. Search results

The database search yielded 102 items. After removing duplicates and screening of title and abstract, 43 reports remained for full text screening. Other methods of searching (prior knowledge and backward search) provided a further 4 reports for full text screening. Of the 47 reports, 22 were excluded following full text screening. The reasons for exclusion were (i) correlations not reported or unclear (k = 5), (ii) measurement issues (e.g., did not measure multidimensional perfectionism; k = 8), (iii) reported correlations of total perfectionism only (k = 5), (iv) was not an empirical study (k = 2), (v) was a thesis which was subsequently published, identified in the search, and included (k = 1), and (iv) not published in English (k = 1). A table of reports and reasons for exclusion are provided in Supplementary Materials (Table S1 and Table S2). Note, for the purpose of the sensitivity analysis we retained and coded studies that did not utilize prespecified measures (k = 7). Subsequently, 25 studies were retained, 18 for the planned meta-analyses and 7 for an ancillary sensitivity analysis. A detailed overview of the search process is shown in Fig. 1.

3.2. Study characteristics

An overview of characteristics of each study is presented in Table 1. Of the 25 studies, 22 were published journal articles and three were unpublished theses. Most provided samples from an education domain (k = 20) with a much smaller number from work (k = 3) and community domains (k = 2). The typical mean age of the samples was 25.62 years (SD = 6.88, range from 19.07 to 44.30) and typical mean percentage of females in the samples was 66.50% (SD = 15.17, range from 37.00 to 100%). There were 10 locations of the studies with USA (k = 10), Canada (k = 4) and Germany (k = 3) the most frequent locations. Studies typically used measures and indictors of PS and PC that we prespecified (k = 18) with a smaller number using measures we did not or used combinations of indicators that included prespecified and non-prespecified indicators (k = 7).

3.3. Meta-analytical effects

Overall meta-analysed effects for the relationships between PS and PC and impostor phenomenon are presented in Table 2. PS displayed a small, positive, and statistically significant relationship with impostor phenomenon (r^{+} = 0.15; 95% CI [.07, 0.23]) whereas PC showed a large, positive, and statistically significant relationship with impostor phenomenon (r^{+} = 0.61; 95% CI [.55, 0.65]). Re-estimating meta-analysed effects correcting for measurement error provided similar estimates for both PS (r^{+} = 0.16; 95% CI [.06, 0.26]) and PC (r^{+} = 0.66;

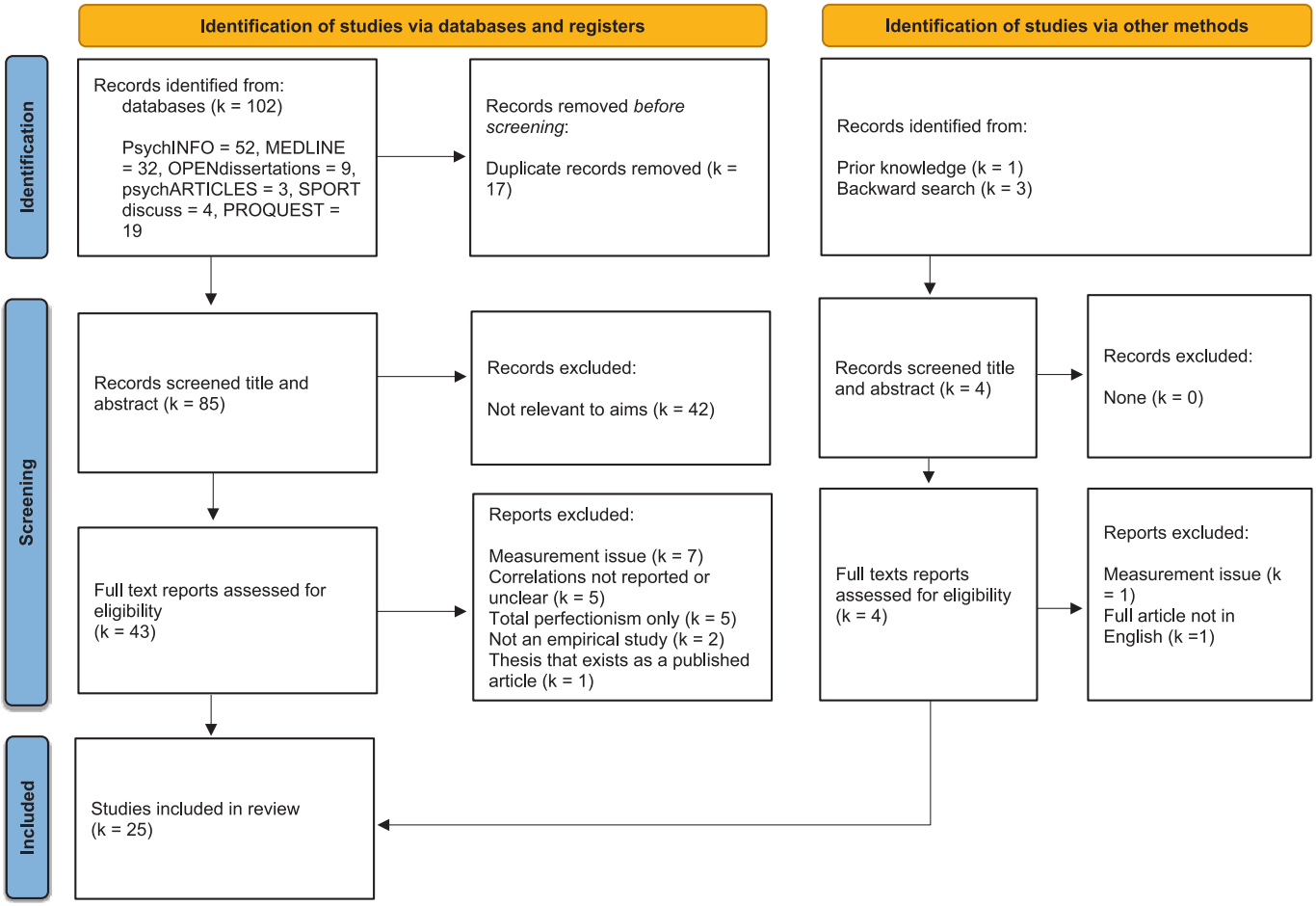

Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

Table 1
Characteristics of studies in the meta-analysis (including those in the sensitivity analysis).

Study	Pub. type	*N*	Domain	Age (SD)	% F	Country	Perf. Int	PS	PC	PC mean	IMP	PS α	PC α	IMP α	PS.PC r	PS.IMP r	PC.IMP r
Austria et al (2024)[a, b]	Article	169	Edu	21.15 (1.11)	83.43	FIL	F-MPS	–	PP	2.95[g]	CIPS	–	0.83	0.91	–	–	0.43
Berry et al (2021)	Article	3352	Edu	30.74 (8.82)	65.78	UK	SAPS	HS	D	4.95	CIPS	0.88	0.88	0.94	0.35	0.20	0.67
Brennan-Wydra et al (2021)	Article	226	Edu	–	53.10	USA	SAPS	–	D	4.19[g]	IP	–	0.89	0.93	–	–	0.64
Cokley et al (2018)	Article	468	Edu	21.00 (2.10)	55.98	USA	APS-R	HS	D	1.45	CIPS	0.89	0.87	0.92	0.03	−0.05	0.65
Cowie et al (2018)	Article	269	Edu	30.70 (7.50)	52.42	CAN	HF-MPS	SOP	SPP	3.29	CIPS	0.88	0.84	0.92	0.48	0.26	0.48
Dudău (2014)	Article	129	Edu	21.79 (1.28)	85.27	ROM	PI	SE	CM	2.41	CIPS	0.77	0.89	0.91	–	0.02	0.62
Fleischhauer et al (2021)	Article	209	Com	26.99 (9.96)	79.00	GER	HF-MPS-S[G1]	SOP	SPP	2.46	CIPS[G]	0.90	0.85	0.92	0.32	0.19	0.52
Gaudreau et al (2022)[a]	Article	315	Edu	21.95 (2.19)	50.10	CAN	SCOPE	P	–	1.61	IP[A]	–	–	–	–	0.12	–
Grenon et al (2020)[a, c]	Article	529	Edu	–	54.63	CAN	PNPS[F]	–	CM[NP]	2.78	QSD	–	0.76	0.86	–	–	0.32
Grubb & Grubb (2021)	Article	634	Edu	23.30 (6.71)	41.32	USA	F-MPS	PS	CM	4.17[g]	CIPS	0.85	0.85	0.92	0.39	0.13	0.45
Hartsfield (1995)	Thesis	130	Edu	22.07 (NR)	78.20	USA	HF-MPS	SOP	SPP	–	CIPS	–	–	–	–	0.30	0.57
Lee et al (2021)	Article	244	Edu	21.38 (5.06)	77.86	USA	HF-MPS	SOP	SPP	3.84	CIPS	0.92	0.88	0.91	0.47	0.30	0.50
Liu, Han et al (2023)[a,d]	Article	1865	Edu	19.92 (1.51)	57.48	CHINA	F-MPS[C]	O	PC+	–	CIPS	–	–	0.96	0.57	0.42	0.71
Liu, Wei et al (2023)[a,e]	Article	227	Edu	19.58 (2.82)	77.53	USA	F-MPS	–	CM+	3.19[g]	CIPS	–	0.90	0.87	–	–	0.57
Mills et al (2024)	Article	302	Edu	34.12 (10.32)	72.52	AUS	SAPS	HS	D	4.82	CIPS	0.87	0.91	0.94	0.34	0.18	0.62
Perlus (2022)	Thesis	506	Edu	–	100	USA	SAPS	HS	D	3.18[g]	CIPS	–	–	–	0.31	0.13	0.78
Pannhausen et al (2022)[f]	Article	274	Com	27.63 (7.90)	79.20	GER	F-MPS[G]	PS	CM	3.18[g]	CIPS[G]	0.82	0.84	0.92	0.45	0.26	0.50
							HF-MPS-S[G2]	SOP	SPP								
Rohrmann et al (2016)[a]	Article	242	Work	44.30 (9.02)	37.00	GER	F-MPS[G]	PS	CM+	2.19[g]	CIPS	0.82	0.85	0.92	0.52	0.21	0.57
Sheveleva et al (2023)	Article	372	Edu	19.07 (1.05)	74.46	RUS	SAPS[R]	HS	D	4.12	CIPS[R]	0.82	0.79	0.89	0.16	−0.03	0.53
Thompson et al (2000)	Article	318	Edu	–	–	AUS	F-MPS	–	CM	2.28[gh]	CIPS	–	–	–	–	–	0.60
Türkel et al (2025)	Article	160	Work	33.72 (8.88)	68.75	TUR	APS-R[T]	–	D	3.89	CIPS[T]	–	0.97	0.93	–	–	0.78
Vergauwe et al (2015)[a]	Article	201	Work	36.11 (10.18)	58.00	BEL	F-MPS[D]	PS	CM+	2.27[g]	CIPS[IR]	0.80	0.92	0.93	0.43	0.03	0.62
Walker & Saklofske (2023)	Article	562	Edu	20.23 (5.41)	69.00	CAN	BTPS-S	RP	SCP	3.48[g]	IPA	0.83	0.83	0.96	0.55	0.31	0.66
Wang et al (2019)	Article	169	Edu	19.60 (0.63)	70.41	RUS	APS-R[R]	HS	D	3.92	CIPS	0.81	0.80	0.88	0.00	−0.16	0.55
Zhou (2023)	Thesis	269	Edu	22.76 (4.72)	54.64	USA	APS[F]	–	D	3.42	CIPS	–	0.93	0.93	–	–	0.54

Note. [a] = did not use prespecified subscales to measure PS and PC so examined as part of sensitivity analysis, [b] = correlations and internal reliabilities are average for multiple subscales (parental criticism and parental expectations), c = correlation (PC.IMP) and internal consistency (IMP) are an average across time points, [d] = Indicator of PS was not a prespecified subscale (organisation) and composite of PC includes a mix of PS and PC subscales (concern over mistakes, parental expectations, personal standards, and doubts about actions), [e] = correlations and internal reliabilities are an average for intervention and control groups at pre-test, [f] = correlations and internal reliabilities are an average of multiple subscales (PS and SOP, CM and SPP) and calculated using partial correlations and bivariate correlations reported in the study, g = mean level is converted from 1 to 5 to 1 to 7 to allow comparison (these scores are used in meta-regressions), [h] = mean level of PC derived from subset of overall sample; PI = Perfectionism Inventory (Hill et al., 2004), BTPS-S = Big Three Perfectionism Scale – Short (Feher et al., 2020), APS-R = Almost Perfect Scale-Revised (Slaney et al., 2001), SAPS = Short Almost Perfect Scale (Rice et al., 2014), APS-R[R] = Almost Perfect Scale-Short –Russian version (Wang et al., 2016), APS-R[T] = Almost Perfect Scale-Revised – Turkish version (Ulu et al., 2012), APS[F] = Almost Perfect Scale – Family version (Wang, 2010), HF-MPS = Hewitt and Flett Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), HF-MPS[G]= Hewett and Flett Multidimensional Perfectionism Scale – German version (Stöber, 2002), HF-MPS-S[G1] = Hewitt and Flett Multidimensional Perfectionism Scale - Short - German version (Stöber, 2002), HF-MPS-S[G2] = Hewitt and Flett Multidimensional Perfectionism Scale – Short – German version (Altstoetter-Gleich, 2014), F-MPS[C] = Frost Multidimensional Perfectionism Scale – Chinese version (no reference available), F-MPS[G] = Frost Multidimensional Perfectionism Scale – German version (Stoeber, 1995), F-MPS[GS] = Frost Multidimensional Perfectionism Scale – Short German version (Stöeber, 2002), F-MPS[D] = Frost Multidimensional Perfectionism Scale – Dutch version (Soenens et al., 2005), PNPS[F] = Positive and Negative Perfectionism Scale – French version (Seidah et al., 2002), HS = Standards, D = Discrepancy, SOP = Self-oriented perfectionism, SPP = Socially prescribed perfectionism, O = Organisation, PC+ = composite of multiple subscales (concern over mistakes, parental expectations, personal standards, and doubts about actions), SP = Striving for perfection, SE = Striving for excellence, CM = Concern over mistakes, CM[NP] = Concern over mistakes derived from negative perfectionism subscale, CM+ = concern over mistakes and doubts about action (or combination of items from both subscales), PP = Parental pressure (parental criticism and parental expectations), RP = Rigid perfectionism, SCP = Self-critical perfectionism, CIPS = Clance Impostor Phenomenon Scale (Clance, 1985; Clance & Imes, 1978), CIPS[G] = Clance Impostor Phenomenon Scale – German version (Brauer & Wolf, 2016), CIPS[R] = Clance Impostor Phenomenon Scale – Russia version (Sheveleva et al., 2021), CIPS[T] = Clance Impostor Phenomenon Scale – Turkish version (Şahin & Uslu Gülşen, 2022), CIPS[IR] = Clance Impostor Phenomenon Scale – with some items removed (Clance, 1985; Clance & Imes, 1978), IP = Imposterism Scale (Leary et al., 2000), IP[A] = Imposerism Scale – adapted (Canning et al., 2019), QSD = Questionnaire du Sentiment d'Imposture pour Enfants et Adolescents (Bouffard et al., 2011), IPA = Imposter Phenomenon Assessment (Walker & Saklofske, 2023).

Table 2
Meta-analytical relationships with sensitivity analysis between perfectionism dimensions and impostor phenomenon.

										Trim and Fill adjusted estimates	
Predictor variables	*k*	*N*	r^+	95% CI	Q^T	I^2	BM test	Egger's intercept	95% CI	k^{TF}	r^+ [95% CI]
Perfectionistic strivings	14	7520	0.15	0.07, 0.23	84.49***	84.49	−0.12	−2.42	−13.02, 8.19	0	–
Additional studies included	18	10,143	0.16	0.13, 0.18	207.04***	91.79	−0.08	−7.35	−19.11, 4.41	0	–
Perfectionistic concerns	18	8383	0.61	0.55, 0.65	163.39***	89.60	−0.10	−1.94	−14.60, 10.71	1	0.68 [.60, 0.77]
Additional studies included	24	11,616	0.60	0.56, 0.63	308.70***	92.55	−0.08	−3.18	−16.08, 9.73	1	0.67 [.59, 0.74]

Note: k = number of studies; N = number of participants; r^+ = weighted mean r; 95% CI = 95% confidence interval; Q^T = total heterogeneity of the weighted mean effect sizes; I^2 = degree of inconsistency in the observed relationship across studies; BM test = Kendall's tau from Begg and Mazumdar (1994) test; k^{TF} = number of imputed studies as part of the trim and fill method; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

95% CI [.61, 0.70]) (Table S3).

3.4. Total unique effects and relative weights of perfectionism

The total unique effect and relative weights of PS and PC are reported in Table 3. The total unique effect of PS and PC on impostor phenomenon was positive, large, and statistically significant (TUE = 0.57; 95% CI = 0.54, 0.60). Dimensions of perfectionism explained 38% of the variance in impostor phenomenon. Relative weight analysis showed that PC (RW_{PC} = 0.36; 96.61%) made a larger contribution to the variance than PS (RW_{PS} = 0.01; 3.39%). When converted to a combined effect, individuals with high levels of perfectionism (+ 1 SD on both PS and PC) report 1.12 standard deviations higher impostor phenomenon than those with low levels of perfectionism (− 1 SD on both PS and PC).

3.5. Sensitivity analysis

Sensitivity analyses are reported in Table 2. Re-estimating overall meta-analytical effects including studies that did not use prespecified measures of perfectionism revealed minor differences in effect size, greater precision in estimates, but also greater variability in estimates for both PS (r^+ = 0.15; 95% CI [.07 0.23], Q_T = 207.04, I^2 = 91.79) and PC (r^+ = 0.61; 95% CI [.55, 0.65], Q_T = 308.7, I^2 = 92.55). However, as preregistered, moderation analyses are based on studies using prespecified measures only.

3.6. Moderation analyses

Moderation analyses are reported in Supplementary Materials (Table S4 and Table S5). For PS, meta-regression showed that age (β = 0.40, p = 0.125), gender (β = 0.06, p = 0.800), and mean level of PC (β = 0.37, p = 0.119) did not moderate the relationship between PS and impostor phenomenon. Similarly, subgroup analyses showed no differences between domains (Q_B = 2.33 [1], p = 0.127) in meta-analytical effects (r^+). There was mixed evidence that meta-analytical effects (r^+) depended on location of study (statistically significant Q_B = 28.89 [3], $p < 0.001$, but overlapping 95% CI among locations) and perfectionism instrument (statistically significant Q_B = 9.85 [1], p = 0.002 but overlapping 95% CI among instruments).

For PC, meta-regression showed that age (β = 0.37, p = 0.167) did not moderate the relationship between PC and impostor phenomenon. However, there was evidence that gender did (β = 0.45, p = 0.039) with larger effects evident among samples with a higher the percentage of females. Subgroup analyses showed no differences between domains (Q_B = 0.86 [1], p = 0.356) and location of study (Q_B = 7.20 [4], p = 0.126). There was mixed evidence that meta-analytical effects (r^+) depended on perfectionism instrument (statistically significant Q_B = 11.58 [2], p = 0.003, but overlapping 95% CI among instruments).

3.7. Publication bias

There was little evidence of publication bias for meta-analytical effects (r^+). All of Kendall's tau and Egger's intercepts were not statistically significant (see Table 2). However, of note, the Trim and fill technique did provide adjusted estimates for PC based on one imputed study to address asymmetry in the funnel plot. The adjusted effects may therefore provide a better summative estimate of the effects of PC. However, overall, effects remained similar is size (with an increase in imprecision). From the additional moderation analyses (see Table S5), there was no evidence that meta-analytical effects (r^+) differed for PS depending on publication type (Q_B = 0.76 [1], p = 0.356) and mixed evidence that meta-analytical effects (r^+) differed for PC depending on publication type (statistically significant Q_B = 4.21 [1], p = 0.040, but overlapping 95% CI among publication type).

3.8. Methodological quality

The results of the methodological quality assessment using AXIS are presented in Supplementary Materials (Table S6). Methodological quality scores ranged from 50% to 70% (M = 64.71, SD = 6.24) with notable weaknesses and uncertainty for issues relating to sampling – justification of sample size, sampling methods and representativeness, and non-respondents – and accounting for non-responses and its impact. Results of the meta-regression analysis using AXIS score (as a percentage) as a moderator are presented in Supplementary Materials (Table S4). AXIS score did not moderate the relationship between PS and impostor phenomenon (β = 0.15, p = 0.55) or the relationship between PC and impostor phenomenon (β = 0.16, p = 0.51).

3.9. Certainty of evidence

The results of the assessment of certainty of evidence using GRADE are presented in Supplementary Materials (Table S7). The overall certainty of evidence for the effect of PS and PC on impostor phenomenon was considered very low and low, respectively. In both cases, this was due to the reliance on observational designs with minimal controls,

Table 3
Total unique effects, relative weights, and combined effects of perfectionism on impostor phenomenon.

Criterion variables	PS k	PS N	PC k	PC N	*r*(PS.Y)	*r*(PC.Y)	*r*(PS.PC)	TUE [95% CI]	RW PS (%)	RW PC (%)	R^2	Combined effect (*d*)
Impostor Phenomenon	14	7520	18	8383	0.15	0.61	0.33	0.57 [.54, 0.60]	0.01 (3.39)	0.36 (96.61)	0.38	1.12

Note. N = Number of participants (when N differs for PS and PC, average N is used to calculate TUE); PS = Perfectionistic strivings. PC = Perfectionistic concerns; Y = Dependent variable; *r* = Bivariate correlation; TUE = Total unique effect; RW = Relative weight (variance explained in dependent variable); 95% CI = 95% confidence intervals; d = Cohen's d (effect size).

varying samples, and unaccounted heterogeneity. The certainty of evidence was upgraded for PC due to the size and precision of the effect. Note, due to the focus of GRADE, certainty of evidence will typically be very low when based solely on observational studies.

4. Discussion

The aim of the present study was to provide the first meta-analysis of the relationship between multidimensional perfectionism and impostor phenomenon. In doing so, we sought to determine the meta-analytical relationship between perfectionism (PS and PC) and impostor phenomenon and whether this relationship was subject to moderation by sample and study characteristics (gender, age, domain, national context/location of the study, or measures of perfectionism). In the case of the relationship between PS and impostor phenomenon, we also examined whether this relationship was subject to moderation by level of PC. As hypothesised, both PS and PC were found to be positively correlated with impostor phenomenon. There was also evidence that the relationship between PC and impostor phenomenon was larger when samples included more females, but PC did not moderate the relationship between PS and impostor phenomenon.

4.1. Revisiting impostor phenomenon and perfectionism

A considerable amount of research has now examined the relationship between perfectionism and impostor phenomenon. The present meta-analysis confirms that the two constructs are typically related – we can expect those who express fears of being an impostor to also typically be more perfectionistic. The largest relationship was evident for PC. So much so, it appears that, in the main, the similarities between perfectionism and impostor phenomenon are rooted in the features of PC. As for why this is the case, it is evident in historical descriptions of both that they share, to a large degree, an inability to internalise success, sense of comparative ability, and inherent self-worth (Clance & Imes, 1978; Greenspon, 2008). Other important similarities include a tendency to be self-critical, discount positive feedback, and overgeneralise failure (Thompson et al., 2000). Overall, in regard to PC, descriptions of perfectionism and impostor phenomenon being closely related and often co-occurring appear apt (Garba et al., 2024; Pannhausen et al., 2022; Rohrmann et al., 2016).

Impostor phenomenon was also typically related to PS but to a much smaller degree. This alludes to an important conceptual nuance – although individuals experiencing impostor fears may exhibit a strong inclination to PC, this may not necessarily translate into active striving for perfection. Rather, the desire to project an image of "effortless perfection" – seeming perfect without trying – appears more relevant and consistent with impostor phenomenon and the underlying goal of displaying "perfection with ease" (Clance & Imes, 1978, p. 243). The desire to project a perfect image by hiding effort has been described by Flett et al (2016) as a defensive orientation associated with the belief that ability is fixed – a belief also central to impostor phenomenon (Noskeau et al., 2021). The perfectionistic qualities of impostor phenomenon, then, may pertain more to a desire to appear perfect without needing to try (rather than trying to obtain perfection through effort). Research examining the relationship between impostor phenomenon and perfectionistic self-presentation, with which impostor phenomenon has a much stronger correlation than with PS, supports this speculation (e.g., Ferrari & Thompson, 2006).

In examining moderation, we found no evidence or mixed and tentative evidence for the majority of factors we explored. One exception was gender with our analyses showing that as the percentage of females in samples increased, so did the size of the relationship between PC and impostor phenomenon. A recent meta-analysis showed that, as Clance (1985) initially suggested, women do typically report higher levels of impostor phenomenon than men (Price et al., 2024). While research examining gender and perfectionism does not support similar differences (Curran & Hill, 2019), recent work on perfectionism and similar sociocultural tropes ("supergirls") points to distinctive experiences of the trait among females (Blackburn et al., 2024). This includes the importance of sociocultural influences that make females especially prone to assuming responsibility for failure to meet impossible expectations (McRobbie, 2007). The themes covered in that area of work speak to both the entrenchment of perfectionism and impostor phenomenon among females, as well as how they might intersect in gender specific ways.

In exploring the interaction between dimensions of perfectionism, we did not find that the relationship between PS and impostor phenomenon was moderated by level of PC. As such, no meta-analytical perfectionistic tipping point was found and the effects of PS were consistent across levels of PC. This suggests that the two dimensions of perfectionism operate somewhat independently and additively, and that the total unique effect of perfectionism adequately reflects the overall relationship. Again, this draws attention to the importance of PC relative to PS in regards to overlap with impostor phenomenon. However, it should be noted that, as yet, there has been no study that has examined the interactive effect of PS and PC on impostor phenomenon. A more direct test of that kind would be beneficial (see Gaudreau & Thompson, 2010). In addition, the meta-analytical test offered here relied on a small number of studies and provided an effect of a size worthy of further examination. As such, we suggest revisiting this issue when additional studies are available.

4.2. Avenues for future research

The meta-analysis highlights a number of areas of future research. Research examining the developmental aspects of impostor phenomenon and perfectionism is needed. This will help further disentangle them by identifying factors common and uncommon to their development. It will also help clarify whether perfectionism leads to impostor phenomenon or vice versa. While both possibilities are suggested by researchers in this area (Blondeau, 2024; Ojeda, 2024), perfectionism is typically stipulated to precede impostor phenomenon in research (e.g., Brennan-Wydra et al., 2021; Liu, Han et al., 2023; Wang et al., 2019). However, this research measures both at the same time–making this ordering tenable but impossible to properly test. In one of the only longitudinal studies of this relationship, Grenon et al (2020) found that PC was part of a profile that predicted impostor phenomenon over a four-year period among students. This provides some evidence that perfectionism may precede impostor phenomenon. However, without assessing changes in both longitudinally, again, what can be inferred in regard to their mutual development is limited.

Additional research is also needed to better understand what factors might explain why the two personality characteristics are related. A small number of studies have done so and suggest that the relationship between perfectionism and impostor phenomenon may partly be explained by lower self-esteem, higher burnout, and compassion fatigue (Cokley et al., 2018; Türkel et al., 2025). However, beyond these two studies, there is little other evidence. Taking into account what is known regarding impostor phenomenon and perfectionism there are number of possible mediators worthy of future examination. These include attributional styles, the tendency for upward social comparison, and ruminative thoughts on perfectionistic themes (Festinger, 1954; Flett et al., 1998; Weiner, 1985). In support of examining these mediators, some play a similar role when examining perfectionism and other variables (e.g., Macedo et al., 2017) and are also related to impostor phenomenon (e.g., Tigranyan et al., 2021).

Given that the current meta-analysis produced limited evidence of moderation in the perfectionism—impostor phenomenon relationship, future research should seek to identify factors that influence the boundaries of that relationship. Individual studies included in the meta-analyses have examined factors such as membership of an honors programme (Lee et al., 2021) and the presence of an ethical climate (Grubb

& Grubb, 2021). In the latter case, there was some evidence that impostor phenomenon was highest when PC was high and the ethical climate was high (i.e., when employees reported that there was a strong focus on ethical behaviour). We therefore encourage a similar focus on socioenvironmental factors that capture the key features of familial, education, work, and other contexts, particularly those that emphasise the need for achievement (Lee et al., 2021). This type of work could prove instrumental in creating positive environments and protecting individuals from both perfectionism and impostor phenomenon. On a similar note, because so few studies have examined the relationship in context of cultural differences and marginalized, minority, and disadvantaged groups, this too is a priority for future research and offers a further means of exploring contextual experiences of the characteristics (Bernard, 2024).

4.3. Limitations and other future directions

There are a number of limitations of the meta-analysis. First, all studies were published in English. English-speaking counties and samples are therefore over-represented. As there is some evident that both perfectionism and impostor phenomenon may be influenced by cultural context (Curran & Hill, 2019; Price et al., 2024), some caution regarding generalisability warranted. Second, relatedly, our classification of the location of studies (nation) lacks sensitivity in regard to cultural influences. Few studies in this area provide information on the ethnicity of participants so an approach of that kind is not possible. A re-examination of the influence of ethnicity is needed once more data is available. Third, the majority of studies included were cross-sectional – no inferences can be made regarding causality and the direction of this relationship. The absence of control variables is also relevant in this regard. Given the close links between both perfectionism and impostor phenomenon and other personality factors (e.g., neuroticism), future meta-analytical work would ideally help locate the two in context of broader approaches to personality. Fourth, moderation analyses included only small number of studies. As such the findings should be considered tentative. As more studies become available effects should be revisited and moderation reassessed. This is especially the case where larger effects allude to possible moderation (e.g., age) and where a small number of additional studies may help clarify mixed evidence (e.g., measure of perfectionism).

5. Conclusion

We provided a meta-analysis of the relationship between multidimensional perfectionism and impostor phenomenon. Both PS and PC were positively related to impostor phenomenon and, in turn, so was overall perfectionism. This relationship was, though, largely an issue of PC highlighting their particular conceptual overlap. In addition, in keeping with initial thoughts on impostor phenomenon, this relationship is stronger when studies included more females. Future research should examine the developmental of both to further disentangle them and identify mediating and moderating factors.

CRediT authorship contribution statement

Andrew P. Hill: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Conceptualization. **John K. Gotwals:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jrp.2025.104639.

Data availability

Data is reported in manuscript.

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