

PERSONAL STANDARDS AND IMPOSTOR FEELINGS

**High Standards, Higher Doubts: The Hidden Cost of Perfectionism on Impostor Feelings in
Graduate Students**

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General Abstract

Over 40 years ago, Clance and Imes (1978) introduced the concept of the impostor phenomenon to describe high-achieving individuals who, despite evident success, experience persistent self-doubt and fear of being exposed as intellectual frauds. This doctoral thesis expanded on that foundational work by examining how perfectionism and its signature cognitive and socio-behavioural expressions shape the experience of impostor feelings among graduate students. Across four studies organized into two distinct research axes, this doctoral research program used meta-analytic, cross-sectional, and short-longitudinal designs to clarify the dispositional and contextual mechanisms contributing to the experience of impostor feelings in academic settings.

Study 1 ($k=20$) provided a meta-analytic synthesis of the associations between perfectionism and impostor feelings. The findings confirmed that perfectionistic concerns are strongly associated with impostor feelings, while perfectionistic standards showed weaker and more inconsistent associations. This distinction aligns with the Model of Excellencism and Perfectionism (MEP), reinforcing the notion that it is not solely the pursuit of high personal standards that is problematic, but how these standards are experienced and expressed. The results from *Study 1* helped identify conceptual gaps in the literature and provided the empirical foundation for the subsequent studies.

Study 2 ($N=372$) and *Study 3* ($N=388$) used independent samples of graduate students to examine whether the distinction between perfectionistic standards and excellencism is differentially associated with the experience of impostor feelings. These studies also explored the moderating role of perceived scientific productivity and exposure to feedback in the context of the peer-reviewed process. The findings revealed that perfectionistic standards, and not

excellencism, positively predicted the experience of impostor feelings, particularly at lower levels of productivity or when exposed to negative feedback. These findings provided empirical validation for the first research axis by demonstrating the importance of distinguishing between high personal standards and perfectionistic standards and their interactions with academic context.

Study 4 ($N=388$) used a short-longitudinal design with two time points to examine how perfectionistic standards are indirectly associated with the experience of impostor feelings through their associations with perfectionistic concerns and self-presentation. The findings supported the theorized indirect relationship between perfectionistic standards and impostor feelings and revealed a mutually reinforcing cycle, in which the experience of impostor feelings led to an increase in perfectionistic concerns and self-presentation, which in turn predicted further impostor feelings. This provides strong support for the second research axis by clarifying the underlying mechanism through which perfectionistic standards are enacted and sustained.

Overall, this thesis provided a theoretical advancement on the role of perfectionism in shaping the psychological experience of graduate students, with a particular focus on the enactment and maintenance of impostor feelings. This thesis laid the groundwork for future research aimed at examining the interplay between dispositional traits and situational pressures in graduate education. Collectively, offering theoretical, methodological, and empirical contributions to the fields of perfectionism, impostor phenomenon, and psychological adjustment in higher education.

Acknowledgements

With this important chapter of my life coming to an end as I complete my doctoral journey, I've taken the time to reflect on the various events that have occurred and all the supportive people I've met along the way. I originally started this doctoral journey in 2017 working on neuroimaging, and despite a change, of course, early on, I could not have anticipated that I could not have anticipated having the opportunity to work on such a fascinating research topic, which proved to both highly fulfilling and cathartic. Without the support I received from everyone throughout my journey, I would not have been able to complete my doctorate, and for that, I am truly and infinitely grateful.

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Statement of Co-Authorship

Both articles included in this doctoral thesis were written in collaboration with my thesis supervisor, Dr. Patrick Gaudreau. Article 1, titled “Perfectionism, Excellencism, and Impostor Feelings: A Meta-Analysis and Two Studies on the Moderating Role of Research Productivity in Graduate Students” has been submitted for peer review to *Self and Identity*. Specifically, to this article, Giovanni Andrade was an additional collaborator. For article 2 titled “Chasing Perfection, Feeling Like a Fraud: How Signature Expressions of Perfectionism are Associated with Impostor Feelings in a Two-Wave Longitudinal Study”, has not been submitted for publication.

As the first author on both manuscripts, I conducted comprehensive literature on the experience of impostor feelings and perfectionism in order to develop hypotheses linking both theoretical frameworks which lead me to conceive and design the studies in collaboration with my thesis supervisor. I also prepared the applications to obtain the ethical approval from the Researcher and Ethics Review Board of the University of Ottawa. Subsequently, I managed and coordinated all data collection, conducted all statistical analyses and ensured the integrity and accuracy of the results, and I drafted the manuscripts, including writing the introduction, method, results and discussion sections. Furthermore, I responded and integrated all feedback from co-authors, and made substantive revisions based on their inputs and that of reviewers throughout the development of this doctoral research program. Throughout the development of my doctoral thesis, my thesis supervisor, Dr. Patrick Gaudreau, provided indispensable theoretical and methodological insight. His continuous mentorship, critical feedback, and guidance significantly enriched the quality and conceptual rigour, which was foundational for the elaboration and completion of my doctoral thesis.

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List of Abbreviations

Abbreviation	Definition
APS	Almost Perfect Scale
BTPS	Big Three Perfectionism Scale
CIPS	Clance Impostor Phenomenon Scale
CM	Concerns Over Mistakes
DAA	Doubts About Actions
DISC	Discrepancy
E	Excellencism
Excel	Excellencism
F-MPS	Frost Multidimensional Perfectionism Scale
GPA	Grade Point Average
GRE	Graduate Record Examinations
HF-MPS	Hewitt-Flett Multidimensional Perfectionism Scale
HS	High Standards
IF	Impostor Feelings
IP	Impostor Phenomenon
IPA	Impostor Phenomenon Assessment
LIS	Leary Impostor Scale
LMX	Leader Member Exchange Model
MEP	Model of Excellencism and Perfectionism
NON	Nonexcellencism/Nonperfectionism
OOP	Other Oriented Perfectionism
P	Perfectionism

Perfect	Perfectionism
PC	Perfectionistic Concerns
PCI	Perfectionistic Cognitions Inventory
PI	Perfectionism Inventory
PS	Perfectionistic Standards
PSP	Perfectionistic Self-Presentation
PSPS	Perfectionistic Self-Presentation Scale
PSPS-Jr.	Perfectionistic Self-Presentation Scale Junior Form
RIGID	Rigid Perfectionism
SCOPE	Scale of Perfectionism and Excellencism
SOP	Self-Oriented Perfectionism
SPP	Socially Prescribed Perfectionism
STRIVINGS	Perfectionistic Strivings
T1	Time 1
T2	Time 2

CHAPTER 1

General Introduction

General Introduction

Statement of the Problem: The Hidden Cost of Perfectionism on Impostor Feelings in Graduate Students

Individuals who seek higher career advancement or intellectual development often pursue higher education. Within the context of higher education, graduate programs are renowned for their academic rigour, competitiveness, and high expectations, attracting outstandingly capable and high-achieving individuals – the best and brightest (McCulloch & Thomas, 2013).

Before entering graduate programs, applicants are subjected to a very selective admission process, where they must demonstrate relevant experience (Mantai & Marrone, 2022), have achieved significant academic prowess (Ghose et al., 2018), and have an astute interest in a specific research field. Also, new applicants are evaluated on their communication skills (e.g., academic writing), research competencies (e.g., data analysis), and interpersonal abilities¹ (e.g., networking) to be competitive for graduate programs (Mantai & Marrone, 2022). Furthermore, some programs require a research proposal and letters of recommendation from established members of the academic community (Jones, 2018), while others mandate formal interviews, contributing to considerable variability and a lack of transparency in the admission process (Andrews, 2023). In sum, this process contributes to creating a highly competitive environment for aspiring graduate students.

¹ Mantai and Marrone (2022, p. 2276) present a more in-depth overview of the skills that application to graduate programs, particularly at the PhD level, are expected to have acquired prior to debuting the admission process. The authors provided a detailed tables based on the Eurodoc framework (Weber et al., 2018) which encompasses 66 distinct attributes or skills, grouped under nine governing themes (i.e., Teaching and Supervision, Research, Mobility, Interpersonal, Enterprise, Digital, Communication, Cognitive, and Career Development).

Despite a very restrictive admission process, the number of applicants to graduate programs has been consistently growing over recent years (Litalien & Guay, 2015; OECD, 2019). Unfortunately, nearly 50% of graduate students will not complete their graduate program (Litalien, 2014; Nettles et al., 2006; van Rooij et al., 2021) while many others struggle with persistent doubts about their ability to succeed (Alfermann et al., 2021; Castelló et al., 2017). Even among those who successfully go through the admission process, graduate programs demand that they quickly and efficiently adapt to ambiguous challenges, often positioning graduate students as *academic superheroes* (Mantai & Marrone, 2022; Pitt & Mewburn, 2016) expected to perform at all costs.

A parallel can be made between elite athletes and graduate students. Both operate at the highest levels of their fields and are subject to immense pressure (Bekkouche et al., 2022; Rice et al., 2016). The expectations placed on professional athletes competing at the national or international levels can mirror those placed on graduate students, who are often seen as key contributors to research and innovation in our society. As such, it is common for high achievers to have very high levels of dedication and to uphold very high personal standards. However, with *great powers come great responsibilities*. On the one hand, the pursuit of high standards can be perceived as a means to achieve desirable outcomes for some individuals. For example, in sports, striving for victory in a championship or securing the gold medal is commonly associated with working relentlessly hard and consistently pushing one's own limits (Watson et al., 2023). On the other hand, the consistent pursuit of high standards can be severely cumbersome and deleterious for many other individuals. As a case in point, there are countless professional athletes, who experience considerable distress as they struggle with meeting their own unrealistic expectations and those imposed by others (Watson et al., 2023). Consequently, consistently having the

perception of falling short of their own standards or that of others, can lead many graduate students, and athletes alike, to feel as if they are *never good enough*.

Defining Success in Graduate Programs: The Role of Adaptation

Success in graduate education is more ambiguous than in sports or undergraduate programs. We know that achieving great success in an undergraduate program (e.g., excellent grades, graduating with honours) does not guarantee the same degree of success during a graduate program (Bair et al., 2004; Hall et al., 2017). Also, while many higher education institutions rely on the *Graduate Record Examinations* (GRE), their predictive role in the success of graduate students is debated in the literature (Feldon et al., 2024; Mulolli & Gothberg, 2022). In Jones and colleagues (2019), the authors concluded that the undergraduate *grade point average* (GPA) and GRE had a *functional* predictive role in determining graduate program persistence that was distinguishable between white and graduate students of colours. Yet, Hall and colleagues (2017) reported not having established a relationship between graduate student's GRE scores and achieving success in graduate programs (e.g., number of publications, completion of degree). Recent meta-analytical findings suggest that GRE scores account for only 4% of variance in first-year graduate GPA and 4.84% of the variance across all academic outcomes (e.g., degree progression, attrition, research, and professional skills; Feldon et al., 2024). Given the weak predictive power of past academic performances and measures of academic potential, more research is needed on the psychological factors that could explain how graduate students adapt themselves to academic demands and most importantly how they learn to navigate through the many academic successes and setbacks.

The Rising Prevalence of Perfectionism and Self-Doubt Within Academia

We know that over the last decades, the expectations placed on university students have escalated, coinciding with increasing perfectionistic tendencies (Curran & Hill, 2019). While most graduate students enter their programs believing they possess the necessary abilities to be successful in their graduate program (Meerah et al., 2012), they frequently interact with accomplished peers, the likes of their research supervisor, other graduate students, and faculty members, who challenge their intellectual and academic prowess (Carless et al., 2023). As such, they face immense pressure while they strive to meet heightening expectations in a faultless manner. Alarming, graduate students often fall short of meeting their expectations, as they set higher standards for themselves (e.g., Mulolli & Gothberg., 2022). Mulolli and Gothberg (2022) illustrate this point with the following qualitative observation:

When you reach this level of education, you're expected to be highly intelligent and that takes several classes actually before I started being very inquisitive because they just know I can do it and I have to show I can do it... I have to just make it happen by any means necessary. (p. 24)

This sentiment aligns with meta-analytic evidence from Curran and Hill (2019), showing that students increasingly equate success with perfectionism. As expectations rise, students continually set higher personal standards, and frequently fall short of their own benchmarks, fostering alarming self-doubts and experiencing the impression that they are not good enough, as if they were impostors.

Overview of the Thesis Structure

To lay the theoretical framework for the research program developed in this doctoral thesis, my dissertation is organized into four chapters. *Chapter 1* provides the theoretical and conceptual foundation, along with background information relevant to the two research axes that

guide the empirical studies. More specifically, on the one hand, *Axis 1* aims to deepen our understanding of how perfectionistic standards relate to the experience of impostor feelings among graduate students, by clarifying the nature of this association and the contextual factors that may influence it. On the other hand, *Axis 2* seeks to further clarify the distinction between the core definition of perfectionism, represented by perfectionistic standards, and its signature expressions, such as perfectionistic self-presentation and perfectionistic concerns, which serve as an underlying mechanism through which the relation between perfectionism and impostor feelings is expressed. *Chapter 2* presents *Manuscript 1*, which correspond to *Axis 1* and includes a meta-analysis and two empirical studies that explore the relationship between perfectionistic standards and impostor feelings, as well as the potential moderating role of perceived research productivity. *Chapter 3* presents *Manuscript 2*, which is aligned with *Axis 2*, and reports a longitudinal study examining whether perfectionistic standards are indirectly associated with impostor feelings through perfectionistic concerns and perfectionistic self-presentation. Finally, *Chapter 4* offers a general discussion that synthesizes findings from both research axes, highlights key contribution, and proposes direction for future research.

The Phenomenological Experience of Impostor Feelings and the Pursuit of High Standards

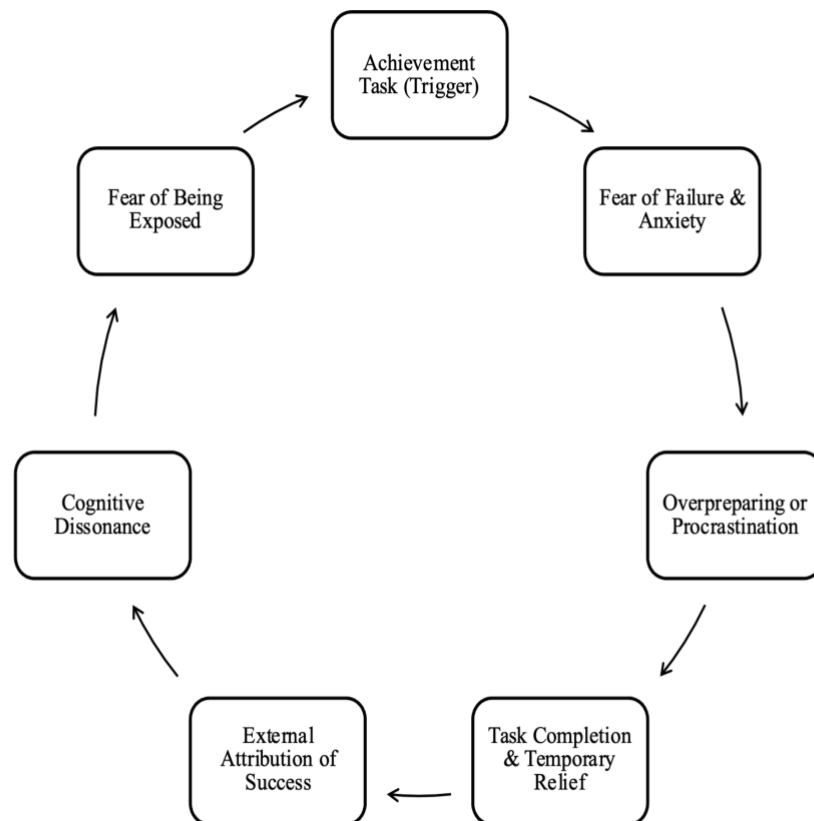
The concept of the *impostor phenomenon* (IP) was originally introduced over four decades ago by Clance and Imes (1978) while studying high-achieving individuals who continuously questioned their skills and capabilities. Their early work focused largely on highly successful individuals (i.e., women and students) in academia who, despite having an objective and valid history of accomplishments, frequently undermined their success, felt less cognitively competent, and dreaded being unmasked by their peers. More precisely, Clance (1985) specified that individuals who experience IP irrationally believe that their successes are attributable to luck

or tremendous effort, rather than their own abilities. Henceforth, they completely minimize their own abilities and doubt their capacity to be successful unless they surpass their past achievements by going above and beyond.

Clance's conceptualization of the IP also includes a depiction of the impostor profile, which comprises six key features. The *impostor cycle*, which is a pervasive iterative cycle (see Figure 1) that can encompass *fear of failure*, the *denial of competence*, and *discounting praise*. More specifically, this cycle is initiated when someone needs to perform and experience severe doubts or anxiety about their ability to succeed (i.e., fear of failure), which brings them to engage in

Figure 1.1

The Impostor Cycle adapted from Clance & O'Toole (1987) and Clance & Lawry (2024)



self-sabotaging strategies (e.g., procrastination) until they receive short-lived praise (i.e., denial of competence and discounting of praise), before repeating the cycle (Clance, 1985). Also, rather than dreading failure, some experience *fear of and guilt about success*, which leads to substantial anxiety related to the potential consequences that accompany success, such as being praised publicly or having to meet higher demands and expectations (Clance, 1985). Ultimately, the impostor profile is further characterized by *the need to be special, to be the very best*, or the *superwoman/superman aspects*. This brings the individuals who experience IP to pursue extremely high personal standards, such as being the best all the time or doing everything flawlessly with ease, despite both being unrealistic or impossible to achieve. Yet when they fall short of meeting their standards, these individuals discredit themselves and become overwhelmed because they failed at being the very best (Clance, 1985). This cycle outlines the intricate nature of the associations between personal standards and IP, which appear to be reciprocally fuelling each other.

Those who experience IP have been objectively successful and they aspire to replicate or even surpass their previous achievements. However, they eventually internalize the irrational belief that they cannot meet their expectations, which restricts their ability to fully appreciate and even recognize their achievements. This is further articulated in Clance (1985) with the emphasis on how those who experience IP will put on a mask to project confidence and a sense of fulfilment to others, while they try to hide their elusive sense of panic and weakness reinforced by the impostor cycle. As a result, while those who experience IP may not exhibit all six characteristics of the impostor profile, upholding very high or even excessively high standards appears to be laying the foundations on which many highly successful individuals experience IP.

The Phenomenon of Experiencing Impostor Feelings

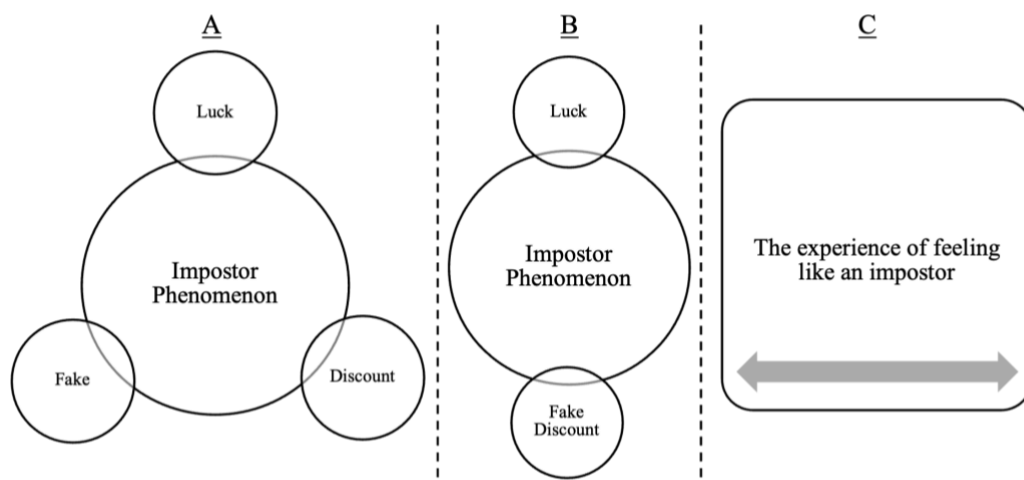
In recent years, the IP has been more commonly known under the term “impostor syndrome” and it has gained a lot of media and research attention (e.g., Bravata et al., 2019; Feenstra et al., 2020; Gullifor et al., 2023). Although bookstores and websites are now flooded with self-help novels and articles that offer “a way to defeat the impostor syndrome”, the exact definition of IP remains debated in the extant literature. As reported in a recent systematic review by Gullifor and colleagues (2023), considerable variability exists in defining and describing IP, ranging from *impostor phenomenon* to *impostor syndrome*, or even *impostorism*. However, IP is fundamentally recognized as the experience of feeling like an impostor or a fraud (Clance 1985; Canning et al., 2020; Gullifor et al., 2023). This definitional aspect of IP offers a consensual nexus upon which to compare and integrate the extant literature.

Historically, IP has been conceptualized as a multidimensional construct (See Figure 1.2A), encompassing elements that pertain to *luck*, *discount*, and *fake* (Chrisman et al., 1995). According to Chrisman and colleagues (1995), *luck* refers to attributing success to external causes rather than ability; *discount* refers to dismissing success or praise; *fake* represents fostering doubts about ability. While this model has been highly influential, subsequent empirical work has questioned the multidimensional nature of the IP construct. French and colleagues (2008) conducted a confirmatory factor analysis on the Clance Impostor Phenomenon Scale (CIPS; Clance, 1985), the most widely used measure of IP (Mak et al., 2019). Their results failed to support a three-factor model, and post-hoc modification of the model resulted in combining *discount* and *fake* under the same factor (See Figure 1.2B). Other factor analytical studies showed high correlations between the factors of a multidimensional model, thus calling into question the need to operationalize IP using more than one factor. In fact, a majority of researchers prefer to combine the factors into a total score (see Mak and colleagues (2019) pp.

11-12) that can be seen as a contradiction to the multidimensional operationalization of the construct. Alternatively, Leary and colleagues (2000) proposed that IP is better explained through a unidimensional model, arguing that IP is best understood as the degree to which an individual experiences impostor feeling (See Figure 1.2C). Additionally, their findings supported the notion that the experience of IP can be more sensitive to situational triggers present in the environment of the afflicted individuals, rather than being solely due to their enduring personality or dispositional tendencies. This perspective was revisited more recently by Gullifor and colleagues (2023) in their theoretical elaboration surrounding the necessity for future research to consider IP as both being a trait-like and state-like construct that can fluctuate across time and contexts.

Figure 1.2

Factorial Composition of the Impostor Phenomenon



Note. A) Multidimensional conceptualization of the Impostor Phenomenon according to Chrisman and colleagues (1995); B) Two factors model of the Impostor Phenomenon according to French and colleagues (2008); C) Unidimensional model of the Experience of feeling like an impostor according to Leary and colleagues (2000).

Although I acknowledge that the term IP is more commonly used in the scholarly literature, my doctoral thesis operationalizes the impostor phenomenon as the *experience of impostor feelings*. The rationale behind my decision to adhere to that definition is based on the necessity to clarify that the main characteristic of IP is the debilitating sensation or feeling of being an impostor or fraud (Leary et al., 2000). Furthermore, Clance herself has admitted in an interview that the *impostor experience* would have been a more accurate term to define the concept (Cuddy, 2015). Additionally, focusing on the experience of impostor feelings provides more context when exploring potential antecedents and potential state-like situational variations of the construct over time. Recently, Cokley and colleagues (2024) also reiterated this notion, by stating that “IP implies a flexible approach to understanding the behaviours associated with feeling like a fraud” (p. 53). Henceforth, throughout my doctoral thesis, I will define IP as a unidimensional construct that refers to the experiences or feelings of being an impostor or a fraud, consistent with the operationalization of Leary and colleagues (2000) and observations that this characteristic is the central definitional aspect of this construct.

Known associations with the experience of impostor feelings. The extant literature has emphasized that the experience of impostor feelings is associated with a myriad of constructs (Bravata et al., 2019). This interest provided considerable insight into the interplay between the experience of impostor feelings and various factors, while exploring the implications of the associations being established. In the subsequent sections, I will elaborate on the intricacy and nuance behind the relationship between some of these constructs and the experience of impostor feelings.

Unsurprisingly, some psychological factors have received a great deal of attention in regard to how they relate to the experience of impostor feelings (Bravata et al., 2019; Garba et

al., 2024). More specifically, depression (Chrisman et al., 1995), anxiety (Fraenza, 2016), and self-esteem (Leary et al., 2000) have each been presented as holding some degree of associations with the experience of impostor feelings.

Depression and the experience of impostor feelings. Research suggests that the individuals who experience impostor feelings are also more likely to report negative emotions (Thompson et al., 1998); in addition, the sustained experience of negative emotions and negative affect are central characteristics leading to symptoms of depression. For example, Chrisman and colleagues (1995) found a moderate positive correlation ($r = .42$) between the experience of impostor feelings and symptoms of depression. This association was further supported by McGregor and colleagues (2008) as they concluded that the individuals who experience impostor feelings also tend to manifest symptoms of depression.

More recently, Sverdlik and colleagues (2020) investigated the mediating role of the experience of impostor feelings in an academic setting. Their findings suggested that the negative relationship between academic belongingness and depressive symptoms was partially explained by the extent to which students experienced feeling like impostors. Precisely, students who felt less academically integrated were more likely to report impostor feelings, which in turn predicted higher levels of depression. This finding highlights how depressive symptoms can be undermined and masked by the experience of impostor feelings, as they mutually feed on one another (McGregor et al., 2008).

Anxiety and the experience of impostor feelings. Anxiety has long been recognized as being highly and positively associated with the experience of impostor feelings (Clance & Imes, 1978). The irrational fear of being “unmasked” or exposed as incompetent often leads many individuals to endure a constant state of hypervigilance, which is anchored in anxiety (Garba et

al., 2024). Unlike depression, anxiety in the context of the experience of impostor feelings is more linked to performance-related concerns (Pervez et al., 2021) or fears of incompetence or inadequacies

The association between the experience of impostor feelings and anxiety has received a lot of attention over the years (Garba et al., 2024). Several studies have reported that both concepts were positively correlated, while being distinguishable from one another (Chrisman et al., 1995; Fraenza, 2016; Pervez et al., 2021). This is unsurprising given that symptoms of generalized anxiety were hypothesized to be commonly reported by those who experience impostor feelings (Clance & Imes, 1978). These individuals are likely to be trapped within the impostor cycle and invest substantially more resources to achieve their objective. However, reaching their goal can be detrimental as it exacerbates their symptoms of anxiety (Pervez et al., 2021), and thus repeats the cycle (Clance & O'Toole, 1987). Alarming, this becomes more problematic when these individuals consistently doubt their ability to pursue ever-augmenting personal standards.

Self-esteem and the experience of impostor feelings. Self-esteem and the impostor feelings have been found to be inversely associated, reflecting overlapping self-evaluative mechanisms in how individuals perceive their worth and competence (Leary et al., 2000). For starters, in its most parsimonious definition, self-esteem represents the value that an individual attributes to themselves (Baumeister et al., 2003). Similarly, an individual who experiences impostor feelings believes that they will fail at reproducing their past achievements because they are riddled by and entertain serious doubts in their own ability, discrediting any objective prior success (Clance, 1985). Therefore, a person's self-esteem does not reflect their actual abilities,

but rather their own perception and assessment of their abilities (Baumeister et al., 2003), thus making it susceptible to be linked to impostor feelings.

Regardless of these similarities, self-esteem and impostor feelings are not the same construct, because whereas self-esteem reflects an individual's sense of self-worth, impostor feelings appear to be situational and contingent on external validation (Leary et al., 2000). Past studies have found that the experience of impostor feelings is negative in nature and inversely related to self-rating of self-esteem, particularly when the outcome of the evaluation is public (Leary et al., 2000; Sonnak & Towell, 2001). More specifically, an individual who experiences strong impostor feelings will publicly report lower self-esteem, compared to an individual who experiences lesser impostor feelings (Leary et al., 2000). Furthermore, this relationship is exacerbated when an individual also believes that others around are regarding them in a more favourable manner than they view themselves (Leary et al., 2000). In other words, the experience of impostor feelings is associated with poorer self-concept (Sonnak & Towell, 2001). Taken together, these findings suggest that while self-esteem and impostor feelings are closely associated through self-evaluative processes, impostor feelings reflect a more externally anchored and context-sensitive form of self-doubt that extends beyond general feelings on low self-esteem.

This notion can be extended to another factor that is particularly salient in the academic context. Specifically, for graduate students, scientific productivity (i.e., production of scholarly outputs) is often seen as a benchmark of competence and success (Horta & Li, 2023). However, the highly competitive and often ambiguous nature of assessing productivity can amplify graduate students' doubts about their abilities, particularly for those who pursue extremely high standards.

Transitioning toward the Study of Personal Standards. Collectively, the research on depression, anxiety, and self-esteem illustrated how the experience of impostor feelings interacts with psychological distress and self-perception. However, an underexplored yet critical factor is the role of personal standards, despite the relations between each factor and the experience of impostor feelings appear to worsen when individuals are pursuing heightened personal standards (Clance, 1985; Fraenza, 2016). While striving for high standards is often seen as adaptive, its relationship with the experience of impostor feelings remains complex (Fraenza, 2016). The following sections will examine how perfectionism and personal standards contribute to the experience of impostor feelings, distinguishing between healthy striving for excellence and perfectionism.

High Personal Standards and the Experience of Impostor Feelings

Contextualizing high personal standards and perfectionism. From its earliest conceptualizations, perfectionism has been recognized as a central factor in the experience of impostor feelings (Clance, 1985). It is widely understood as a multidimensional personality disposition (Flett & Hewitt, 2020), typically classified into two broad dimensions referred to as perfectionistic concerns (PC; also called evaluative concerns perfectionism or self-critical perfectionism) and perfectionistic standards (PS; also called personal standards perfectionism or rigid perfectionism) (Cox et al., 2002; Smith et al., 2022; Stoeber & Otto, 2006). Each dimension captures different facets of what it means to be a perfectionist.

PC reflects the tendency to worry about mistakes, doubt one's actions, feel pressured by others to be perfect, react negatively to imperfections, and perceive a gap between desired and actual performance. This dimension is commonly described as the maladaptive or unhealthy aspect of perfectionism. In contrast, PS refers to the self-imposed pursuit of high or

perfectionistic standards by which individuals evaluate themselves (Frost et al., 1990; Hewitt & Flett, 1991). Many scholars argue that this dimension represents the core feature of perfectionism, as striving for exceedingly high standards is a defining characteristic of the trait (e.g., Gaudreau, 2021; Stoeber & Otto, 2006). Consequently, PS has been debated as a potentially healthy form of perfectionism (Hill & Curran, 2016; Smith et al., 2022), as it reflects a strong internal motivation to attain high personal standards. However, growing empirical evidence indicates that elevated PS can be linked to severe negative outcomes such as suicidal ideation (Smith et al., 2018) and depression (Smith et al., 2021, 2022). Therefore, further underscoring the importance of re-evaluating how striving for perfection may, under certain conditions, fuel maladaptive experiences such as impostor feelings, particularly in high-achieving academic settings.

The context of graduate students is particularly interesting, as it is marked by a unique combination of intellectual pursuit and multifaceted challenges. Also, graduate students are expected to learn to balance the expectations to excel academically while answering the increasing demands to produce high-quality work early on in their development (Pitt & Mewburn, 2016). As such, it is not uncommon that many graduate students consider themselves to be high achievers as they frequently pursue very high standards. According to Clance (1985), high-achieving individuals commonly experience impostor feelings as they become victims of their relentless pursuit of high standards and recognition to validate their abilities and prove their success to their peers. Furthermore, the experience of impostor feelings undermines an individual's ability to accept their own success and abilities, which is depicted in Clance (1985) "No matter what I do it's not enough" (p. 29). As a result, the relentless pursuit and the unavoidable inability to meet their perfectionistic standards, can bring many graduate students to

feel compelled to conceal their weaknesses to avoid being perceived as an impostor or a fraud by their peers (Pervez et al., 2021).

What remains unclear is that many graduate students will successfully navigate the challenges that arise throughout their program as depicted in the qualitative work led by Hay and Samra-Fredericks (2016):

Downbeat and disheartened I convened an urgent meeting with my supervisory team and as a consequence inadvertently reached another important milestone in my doctoral journey. I had to take these discussions to my specific area of research by discussing with my supervisors. The fear would subside as I understood their explanations which showed a lot of maturity and experience. I could move to the next stage with confidence and with a positive frame of mind. (p. 416)

The example presented above is particularly relevant as it illustrates how many graduate students will be able to *overcome the fear that haunts their success*. However, not all graduate students will feel the same throughout the duration of their program, as many will fear that their perceived *imperfection* may expose them as a fraud to their peers (Cowie et al., 2018).

As such, many individuals can see the appeal of pursuing very high personal standards through perfectionistic striving, despite its involvement in the harsh self-evaluating aspects that accompany their strivings (Hewitt & Flett, 1991). Unfortunately, the pursuit of perfection is not achievable, as it is indicative of unrealistic and excessively high personal standards (Gaudreau, 2019, 2021; Gaudreau et al., 2022). Therefore, perfection strivers will continuously set excessively higher personal standards, while becoming increasingly critical of their accomplishments (Stoeber & Otto, 2006). Given that impostor feelings emerge from chronic

self-doubts and perceived inadequacy, it follows that perfectionism – whether through PS or PC – may play a critical role in their development and how they are experienced.

Known relations between perfectionism and the experience of impostor feelings. It is to be noted that in her highly influential book titled *The Impostor Phenomenon Overcoming The Fear That Haunts Your Success*, Clance (1985) has explicitly emphasized the close association between perfectionism and impostor feelings by identifying perfectionism as a contributing factor to two central characteristics of IP (i.e., the need to be special, the very best, and the superwoman/superman aspect). In fact, Clance (1985) even stated that “due to their need to be the best, impostors are very perfectionistic in almost every aspect of their performance” (p. 26). Unsurprisingly, both concepts were seemingly predisposed to be associated with one another.

Over the years, some research has investigated how the experience of impostor feelings and perfectionism are related (Dudău, 2014; Pannhausen et al., 2020; Thompson et al., 2000). For example, Rohrmann and colleagues (2016) have reported that the experience of impostor feelings is positively associated to a varying extent with both PC ($r=.57$) and PS ($r=.21$). Similar patterns of correlations were found by Pannhausen and colleagues (2022) for both PC ($r=.67$) and PS ($r=.19$). However, the results of a multiple regression showed that only PC emerged as a robust predictor of the experience of impostor feelings ($\beta=.69, p<.001$), whereas PS was not found to have any predictive capacity ($\beta=-.08, p=.097$) (Pannhausen et al., 2022). Other studies have reported similar results. For example, Cokley and colleagues (2018) found that PC alone was a robust predictor of the experience of impostor feelings ($\beta=.65, p<.001$), while PS had a non-significant negative predictor ($\beta=-.05, p=.34$). Overall, the associations between perfectionism and the experience of impostor feelings are more convoluted than initially anticipated.

Results for the experience of impostor feelings align with broader research on perfectionism and psychological maladjustment. First, the positive associations between PC and the experience of impostor feelings are strong and robust. This can be used as evidence for the unhealthy outcomes associated with perfectionism. Second, the associations between PS and impostor feelings appear to be weaker and less consistent across studies. For example, several other studies failed to provide statistical significance in the correlation between indicators of PS and the experience of impostor feelings (Cokley et al., 2018; Holden et al., 2021; Vergauwe et al., 2015). In Wang and colleagues (2019), the experience of impostor feelings was negatively associated with PSP ($r = -.16$). Some of these findings can fuel the idea that perfectionism is not inherently maladaptive and may be beneficial for some individuals under certain circumstances. Considering that PS and PC are positively correlated, yet differentially linked with the experience of impostor feelings, more research will be needed to further our understanding of the intricate linkages between perfectionism and impostor feelings.

This Doctoral Thesis

The overarching goal of my doctoral thesis is to investigate the layered dynamics of the complex association between perfectionism and impostor feelings. To attain this goal, I will revisit the association between perfectionism and the experience of impostor feelings using the recently developed Model of Excellencism and Perfectionism (MEP; Gaudreau, 2019). Two specific research axes are proposed to examine the two fundamental assumptions proposed by the MEP. These two assumptions are detailed in the upcoming two subsections because they will serve as the foundation for *Manuscript 1* and *Manuscript 2* of my doctoral thesis, respectively.

Axis 1: The Distinction Between Perfectionism and Excellencism

According to the MEP, there is a need to draw a clearer distinction between the pursuit of excellence and the pursuit of perfection. In the MEP, the term *excellencism* represents the tendency to aim and strive toward flexible very high standards. Striving for excellence can also be characterized by the motivation to reach great success (Gaudreau, 2019). For example, an individual who strives for excellence is likely to pursue difficult but realistic goals, or to desire to be very productive (Gaudreau et al., 2022). In contrast, the term *perfectionism* is better described by the predisposition to aim and strive toward idealized standards, with a constricting tendency to relentlessly pursue them excessively. For example, an individual who strives for perfection will go beyond excellence, as they would pursue unrealistic goals to attain perfection, or to relentlessly aspire to be exceptionally productive all the time (Gaudreau et al., 2022). Therefore, the MEP provides a conceptual clarification to dissociate the pursuit of excellence from the pursuit of perfection in order to more accurately estimate the outcomes associated with PS.

Past studies did not differentiate between excellencism and perfectionism. Some studies measured PS using questionnaires that blend high and perfectionistic standards (for a review see Osenk et al., 2020) or measures that were almost exclusively tapping into high or excellencism standards. As such, the MEP is a useful framework for revisiting and re-estimating unexpected findings in the existing perfectionism literature. For example, in a recent meta-analysis, Burcas and Cretu (2021) found a positive correlation between self-oriented perfectionism and test anxiety ($r = .18$) and a non-significant correlation between high standards and test anxiety ($r = -.05$). When clearly separating how PS are measured, it appears like the purest measures of PS (the ones consistent with the definition of perfectionism) can be significantly associated with negative outcomes such as anxiety. The first goal of my doctoral thesis will be to conduct a meta-

analysis to estimate the associations between PS and impostor feelings, determining if results from past studies differed according to how PS were measured (see *Manuscript 1, Study 1*).

Based on the MEP, Gaudreau and colleagues (2022) developed the Scale of Perfectionism and Excellencism (SCOPE) to clearly differentiate between excellencism and PS. Results provided support for a two-factor model. Conceptualizing excellencism and perfectionism as separate constructs allows for isolating and properly estimating the effects associated with PS. Past studies often found a positive association of PS with academic performance (Madigan, 2019) and creativity (for a review see Goulet-Pelletier et al., 2022). However, they did not clearly measure PS because their questionnaires conflated excellencism and PS. Using the SCOPE, Gaudreau and colleagues (2022) found that PS are negatively (rather than positively) associated with the academic performance of university students. The same associations were found among adolescent high school students (Tape et al., 2024). In addition, similar results were found to predict creativity (Goulet-Pelletier et al., 2022, 2025). Across these studies, it was excellencism (rather than perfectionism) that was positively associated with school performance and creativity. These results are insightful because they illustrate that excellencism and perfectionism need to be conceptualized as two distinct constructs, as they are distinctively associated with various outcomes.

A recent narrative overview of the MEP literature by Gaudreau and Benoît (2025) highlights the growing empirical research on the MEP showing that excellencism and perfectionism are associated with distinct patterns of psychological outcomes. Specifically, they noted that excellencism tends to be positively associated with adaptive outcomes such as savouring positive experiences (Gaudreau et al., 2024), self-esteem, and openness to experience (Bien et al., 2024), life satisfaction, psychological well-being, a sense of competence (Gaudreau

et al., 2022; Shin & Kim, 2024), self-efficacy (Goulet-Pelletier et al., 2022), and perceived goal attainment (Gaudreau et al., 2021). In contrast, perfectionism is more consistently associated to maladaptive outcomes, such as higher levels of depressive symptoms (Tape et al., 2024; With et al., 2024), psychological distress (With et al., 2024), academic dropout intention (Gaudreau et al., 2024; Gaudreau & Benoît, 2025), and the frustration of psychological needs for competence and relatedness (Shin & Kim, 2024; Pétrin-Pomerleau et al., 2025). Perfectionism has also been positively associated with moral disengagement, cheating attitudes, and hyper-competitiveness (Gaudreau & Schellenberg, 2022), while being negatively associated with body acceptance (Gaudreau & Schellenberg, 2024) and self-compassion (With et al., 2024). Also, perfectionism has shown positive associations with anxiety, stress (Tape et al., 2024), neuroticism (Bien et al., 2024), fear of failure (Gaudreau et al., 2021), performance anxiety and negative affect in music (Racine et al., 2025). Together, these findings reinforce the conceptual distinction between excellencism and perfectionism, underscoring the former's alignment with healthier functioning and the latter's connection to psychological vulnerability.

The results of the MEP further align with the need to revisit the theoretical underpinning of known factors associated with the experience of impostor feelings, as recently proposed by Gullifor and colleagues (2023). Gaudreau and colleagues (2022) studied the associations of excellencism, perfectionism (i.e., PS), and impostor feelings in a sample of undergraduate students. Their results showed that excellencism was negatively associated with impostor feelings. In contrast, PS was positively associated with impostor feelings. Overall, the MEP appears to be a theory capable of addressing important conceptual and theoretical gaps in both the perfectionism and IP literature. Therefore, the second goal of my doctoral thesis will be to

examine the associations of excellencism, perfectionism, and impostor feelings – this time in samples of graduate students (see *Manuscript 1, Study 2 and Study 3; Manuscript 2*).

Axis 2: Core Definitional Feature Versus Signature Expressions of Perfectionism

According to the MEP, there is a need to reexamine the broad operational definition of perfectionism. In a recent critical revaluation of the perfectionism construct, Gaudreau (2021) noted that most researchers agree that perfectionism is composed of two interrelated elements. More precisely, perfectionism is generally defined as “a personality disposition characterized by striving for flawlessness and setting exceedingly high standards of performance accompanied by overly critical evaluations of one’s behavior” (Stoeber, 2018, p. 3) or as “the setting and striving for excessively high and often unrealistic standards, accompanied by frequent thoughts focused on attainment of these standards and overly critical self-evaluation” (Sirois & Molnar, 2016, p. 1).

According to Gaudreau (2021), the wording “*accompanied by*” is pivotal in these definitions. Specifically, it plays a crucial role in characterizing PS. This phrasing suggests that PS are often linked to, but not defined by, the kinds of self-critical thoughts and evaluation capture by PC. In other words, PS tend to co-occur with features such as doubts about actions, concerns over mistakes, and the perceived need to meet unrealistically high expectations. If we accept the commonly agreed-upon definition of perfectionism, we also recognize that the concepts measured in the broader PC dimension, namely its cognitive, social and behavioural manifestations, are common correlates of PS. However, these elements reflect how perfectionism is typically expressed, rather than forming part of the core definitional feature of dispositional perfectionism.

Other researchers made similar observations, although they did not explicitly separate the core definitional feature of perfectionism from its characteristic expressions. For example, in their cognitive theory of perfectionism, Flett and colleagues (2018) described a variety of psychological processes such as harsh self-criticism, rumination about mistakes, contingent self-worth, all-or-nothing mentality, overgeneralization, intrusive thoughts and images of imperfection, negative self-talk, catastrophizing, perceived pressure from parents or society, concerns with self-presentation, excessive worry about negative evaluations, and a sense of discrepancy between performance and goals. These were identified as recurring patterns that are commonly associated with perfectionism, rather than features that define it. According to Flett and colleagues (2018, p. 90), the constructs included in PC and similar dimensions represent, “characteristic response tendencies that typically accompany perfectionism”. Also, Lo and colleagues (2020) similarly argued that these elements should not be viewed as perfectionism itself, but as psychological features and processes that frequently co-occur with perfectionism. Henceforth, the MEP builds on this conceptual distinction by recognizing PS as the core dispositional feature of perfectionism, while its cognitive, socio-cognitive, and socio-behavioural manifestations are referred to as *signature expressions of perfectionism* (Gaudreau, 2021; Gaudreau et al., 2024).

Figure 1.3 illustrates the distinction between typical studies examining the independent effects of PS and PC (see Panel A) and MEP studies (see Panel B). The MEP repositions PS as the core definitional feature of perfectionism. People who are perfectionists are more likely to experience a myriad of signature expressions of perfectionism. They are more likely to doubt their actions, have concerns over mistakes, feel pressure to be perfect, and be critical of themselves. This is consistent with 30 years of research showing a moderate-to-strong positive

correlation between PS and PC (e.g., Smith et al., 2022). The perfectionists who do experience frequent and intense enactment of these perfectionistic concerns are at greater risk of psychological distress. In fact, PC has been systematically linked to psychological maladjustment across many meta-analytical reports (e.g., Smith et al., 2022). There is no debate about the fact that PC is the perfectionism variable more strongly and robustly associated with psychological maladjustment. In keeping with this evidence, the MEP repositions PC as the proximal predictor of psychological mechanisms in the perfectionism conceptual landscape. In contrast, PS is repositioned as the core definitional feature of perfectionism that enacts, activates, reinforces, and maintains the likelihood of experiencing perfectionistic concerns. In that complex network of associations, PS is hypothesized to be positively associated with PC which, in turn, is hypothesized to be positively associated with psychological maladjustment. This network of interrelated hypotheses implies that PS is indirectly and positively associated with psychological maladjustment because it enacts, activates, reinforces, and maintains the doubts about actions, concerns over mistakes, pressure to be perfect, and self-criticism that are proximally and strongly associated with psychological maladjustment.

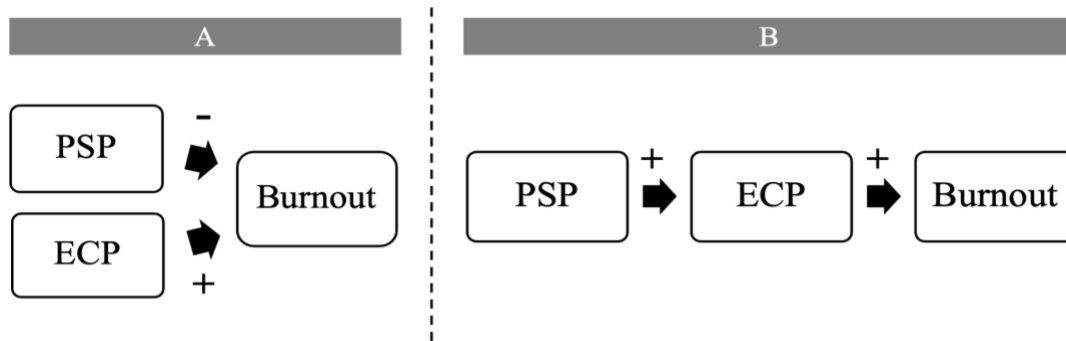
A third goal of my doctoral thesis is to examine the network of associations proposed in the MEP to better understand the associations between PS, PC, and the experience of impostor feelings of graduate students (see *Manuscript 2*). To my knowledge, studies have yet to directly examine these associations. Two indirect evidence exists to support these hypotheses. First, Gaudreau (2021) reanalyzed the meta-analytical effects reported in the meta-analysis of perfectionism and burnout by Hill and Curran (2015). Using the independent effects approach (see Figure 1.3, Panel A), Hill and Curran (2015) concluded that PS is negatively associated with burnout while PC is positively associated with burnout. This result is counterintuitive because PS

and PC are positively correlated. The meta-analytical path analysis of Gaudreau (2021) showed that PS is positively associated with PC, which is in turn positively associated with burnout.

When reinterpreted together, these findings indicate that PS has a significant positive indirect association with burnout. PS is a distal predictor that indirectly is related to burnout because of its network of associations with PC.

Figure 1.3

Contrasting Models of the Associations Between Perfectionism and Burnout



Note. Panel A illustrates the meta-analytical associations reported by Hill and Curran (2015), where personal standards perfectionism (PSP) is negatively associated with burnout and evaluative concerns perfectionism (ECP) is positively associated with burnout. Panel B depicts the model proposed by Gaudreau (2021), in which PSP positively predicts ECP, which in turn positively predicts burnout.

Second, Gaudreau and colleagues (2024) reanalyzed the meta-analytical effects reported in the meta-analysis of perfectionism and self-esteem by Hill and colleagues (2018). Using the independent effects approach (see Figure 1.3, Panel A), Hill and colleagues (2018) concluded that PS is positively associated with self-esteem while PC is negatively associated with self-esteem. This result is counterintuitive because PS and PC are positively correlated. It is also supportive of the controversial position that perfectionism can be adaptive or healthy (e.g.,

Stoeber & Otto, 2006). The meta-analytical path analysis of Gaudreau and colleagues (2023) showed that PS is positively associated with PC, which is in turn negatively associated with self-esteem. When reinterpreted together, these findings indicate that PS has a significant negative indirect association with self-esteem. PS is a distal predictor that indirectly is related to self-esteem because of its network of associations with PC.

These two examples of secondary data reanalysis offered indirect evidence because they re-estimated the specific roles of PS and PC in studies that did not differentiate excellencism and perfectionism. Article 2 of my doctoral thesis will bring together the two fundamental distinctions proposed in the MEP: (a) the distinction between excellencism and perfectionism and (b) the distinction between the core definitional feature of perfectionism (PS) and signature expressions of perfectionism (PC). Our conceptualization of the signature expressions of perfectionism will also include perfectionistic self-presentation – an important factor potentially associated with the impostor feelings (Leary et al., 2000; Ferrari & Thompson, 2006; Cowie et al., 2018; Garba et al., 2024).

Past studies showed a robust association between PC and impostor feelings (e.g., Pannhausen et al., 2020). Circling back to the individuals struggling with the experience of impostor feelings, they appear to be greatly influenced by the cognitive, and the socio-behavioural signature expressions of perfectionism. These individuals are particularly sensible to the fear of being exposed to others for the fraud they believe they are (Clance, 1985; Leary et al., 2000; Garba et al., 2024), which is aligned with the conceptual realm of perfectionistic self-presentation. Specifically, *perfectionistic self-presentation* is a self-regulatory or behavioural expression that involves a strategic attempt to present oneself as flawless, while concealing mistakes or limitations (Hewitt et al., 2003). To that extent, Leary and colleagues (2000)

proposed that some individuals who engage in these behaviours (e.g., dismissing praise, externalizing success) can do so strategically to manage expectations by outwardly projecting self-doubt, predominantly when performing in a public setting. This suggests that self-presentational behaviours serve an interpersonal rather than intrapersonal purposes, since they could be contextually enacted to secure social approval, reduce performance pressure, or even elicit support. Perfectionistic self-presentation should therefore be associated with the experience of feelings like an impostor.

This is particularly important because Gullifor and colleagues (2023) raised some concerns regarding toward how the existing literature on impostor feelings often reports and outline conclusions that are inadequately defined and, in many cases, inaccurately represented. This greatly limits our ability to fully grasp the roles of interpersonal antecedents (e.g., signature expressions of perfectionism) in the enactment of the experience of impostor feelings, as further investigation is required to understand the interplay between these antecedents and their influence on the contextual experience of impostor feelings. Precisely, how perfectionism (i.e., PS) is theoretically associated with the experience of impostor feelings (Thompson et al., 2000; Wang et al., 2019), constitute a compelling example of how dispositional traits and antecedental factors can be misattributed in the experience of impostor feelings. After all, while not all perfectionists experience impostor feelings, many individuals who do struggle with the experience of impostor feelings aim for perfection (Clance, 1985).

Research Questions of This Doctoral Thesis

My doctoral research program aimed at addressing two overarching questions through two distinct empirical articles. Firstly, and aligned with *Axis I*, to what extent are perfectionistic standards associated with the experience of impostor feelings among graduate students, and how

this relationship can vary depending on perceptions of scientific productivity? This question is addressed through a meta-analysis (i.e., *Study 1*) and two empirical studies conducted on independent samples of graduate students. These studies examine whether perfectionistic standards can be meaningfully distinguished from the pursuit of excellence, and whether perceived scientific productivity moderates their relationship with the experience of impostor feelings (i.e., *Study 2*), within academic context dependent feedback scenarios (i.e., *Study 3*). Secondly, and consistent with *Axis 2*, do perfectionistic standards indirectly contribute to the experience of impostor feelings through their association with signature expressions of perfectionism, such as perfectionistic concerns and perfectionistic self-presentation? This question is addressed in a longitudinal study that builds on prior cross-sectional work by following-up with graduate students recruited in *Study 3* over time (i.e., *Study 4*). Together, these four studies provide a deeper understanding of how the definitional core of perfectionism operates through specific psychological and social expressions to influence the experience of impostor feelings among graduate students in academic settings.

CHAPTER 2

Perfectionism, Excellencism, and Impostor Feelings: A Meta-Analysis and Two Studies on the Moderating Role of Research Productivity in Graduate Students

Antoine Benoît, Giovanni Andrade and Patrick Gaudreau

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Authors' Contribution Statement CRediT for Manuscript 1

Antoine Benoit: Conceptualization (equal); data curation (equal); formal analysis (equal); investigation (lead); methodology (equal); project administration (supporting); software (equal); validation (equal); visualization (equal); writing – original draft (lead); writing – review editing (equal). **Giovanni Andrade:** Data curation (supporting); validation (supporting); writing – review and editing (equal). **Patrick Gaudreau:** Conceptualization (equal); data curation (equal); formal analysis (equal); funding acquisition (lead); methodology (equal); software (equal); project administration (equal); materials (lead); supervision (lead); validation (equal); visualization (equal); writing – review and editing (equal).

ABSTRACT

Previous research examining the link between perfectionistic standards and impostor feelings has yielded mixed results. Responding to recent recommendations to distinguish between the pursuit of high standards (excellencism) and perfectionistic standards (perfectionism), this research re-examined these relationships across three studies. Study 1, a meta-analysis ($k=20$), found that proxy measures of perfectionism (e.g., self-oriented perfectionism), but not proxy measures of excellencism (e.g., high standards), were significantly associated with impostor feelings. Study 2, conducted with graduate students ($N=372$), revealed that only those with perfectionistic standards experienced more impostor feelings when dissatisfied with their research productivity. Study 3 ($N=388$) replicated these findings with a measure of annual research productivity and relied on three hypothetical feedback scenarios to explore how perfection and excellence strivers react during the peer review process. Results showed that perfection strivers experienced higher impostor feelings than excellence strivers when research productivity is low and during hypothetical scenarios of receiving positive and mixed feedback. Our findings suggest that pursuing perfection beyond excellence is detrimental, as it heightens impostor feelings in graduate students when they fail to meet their idealized standards.

Keywords: *Perfectionism, Excellencism, Impostor Phenomenon, Graduate Students, Model of Excellencism and Perfectionism*

Educational significance statement

This study indicates that students who are pursuing perfection are more likely to feel like impostors than students who pursue excellence. Among graduate students, this effect is observed only for those who are less satisfied with their research productivity or those with lower levels of annual research productivity. Research productivity reduces the impostor feelings of students but creates self-worth contingencies that make perfectionistic students more vulnerable when they fail to attain the extremely high and unrealistic standards they set for themselves.

Perfectionism, Excellencism, and Impostor Feelings: A Meta-Analysis and Two Studies on the Moderating Role of Research Productivity in Graduate Students

Many people tend to perceive themselves as a fraud or someone unworthy of the position or status they have rightfully earned with their skills, effort, and perseverance. They entertain doubts about themselves and undervalue their abilities and achievements. People who experience impostor feelings attribute their success to a fluke that tricked everyone into believing that they are more competent than they are. They are convinced that other people wrongfully overestimate their worth and that they will eventually discover their true inadequacies. These subjective feelings of fraudulence are interrelated, and together, they form the foundation of a psychological construct called the *Impostor Phenomenon* (e.g., Clance & Imes, 1978) or what we hereafter refer to as impostor feelings. Several researchers have proposed that impostor feelings can be triggered by perfectionism (e.g., de Vries, 2005; Leonard & Harvey, 2008), as they both involve persistently high aspirations to succeed accompanied by persistent sense of inadequacy. Surprisingly, however, studies looking at the association between the pursuit of perfectionistic standards and the experience of impostor feelings have produced mixed findings (e.g., Cokley et al., 2018; Walker & Saklofske, 2023).

In this study, our goal was threefold. In Study 1, we conducted a meta-analysis, with no restriction on participants' age and occupations, to review the studies that examined the correlations between perfectionism and the impostor phenomenon. Informed by these findings, we conducted Study 2 and Study 3 to investigate the impostor feelings of two independent samples of graduate students within the confines of a new theory (Gaudreau, 2019; Gaudreau et al., 2022) that separates the students who pursue high standards (i.e., excellence strivers) and those who pursue perfectionistic standards (i.e., perfection strivers). A rallying point in the

literature is the idea that perfection strivers derive their self-worth based on their achievement (e.g., Hewitt et al., 2017; Limburg et al., 2017). In the context of their graduate education, students are expected to maintain good levels of scientific productivity. Therefore, we examined if the research productivity of students attenuates or exacerbates the propensity of perfectionistic students to experience of impostor feelings. In Study 2 and Study 3, we relied on complementary measures of scientific productivity to probe this overarching research question.

An Overview of Impostor Feelings

A systematic review of 62 studies indicates that as many as 82% of individuals have reported experiencing impostor feelings at some point in their lives (Bravata et al., 2020). Feeling like an impostor is a subjective experience and rarely reflects the actual talent, skills, and competencies of the person. Nevertheless, holding such beliefs about oneself appears sufficient to significantly impact the psychological wellness of individuals. Across different populations (e.g., students, teachers, health professionals) and settings (e.g., school, work), the impostor phenomenon has been found to positively correlate with symptoms of burnout (e.g., Hutchins et al., 2018), depression (e.g., Tigranyan et al., 2021), suicidal ideation (e.g., Brennan-Wydra et al., 2021), anxiety, and stress (e.g., Cowie et al., 2018). Studies have also related impostor phenomenon with lower ratings of well-being (e.g., Pákozdy et al., 2023), need satisfaction and self-determination (e.g., Neufeld et al., 2023), and performance (e.g., Hudson & González-Gómez, 2021). Overall, forty years of research have shown that many people sometimes experience multifarious negative outcomes associated with impostor phenomenon.

Impostor feelings are typically triggered by a mixture of dispositional and situational factors that could explain the relative stability and change in impostor feelings across time and situations (e.g., Canning et al., 2019; Gullifor et al., 2023; Leary et al., 2000). Among people

who feel like impostors, “the trigger is often perfectionism” (de Vries, 2005, p. 112). The notion that impostor feelings can be tied back to perfectionism has been a rallying point in the literature (e.g., Leonard & Harvey, 2008). Interrelated theoretical arguments can be made to justify this position.

Perfectionism and impostor feelings are distinct phenomena that converge on the idea that some people have recurrently high aspirations to achieve success while feeling like they are never good enough (Dudău, 2014). Perfectionists evaluate their self-worth using extremely high and unrealistic personal standards (e.g., Egan et al., 2016; Hewitt et al., 2017). Self-regulation research has repetitively shown that extremely difficult goals are rarely attained and leave people unsatisfied about their achievements (e.g., Carver & Scheier, 1998; Kerr & LePelley, 2013; Locke & Latham, 2013). As a result, perfectionists appear to bog down in a goal discrepancy loop created by their unwavering desire to reach unrealistic standards of perfection (Sirois, 2016). Given that their sense of self is contingent on their achievement (e.g., Egan et al., 2016), goal discrepancy threatens their sense of self-worth and makes them fear that their inadequacies will be exposed to others. Perfectionists are good candidates to frequently experience impostor feelings.

Perfectionism and Impostor Feelings

Theoretical arguments for the association between perfectionism and impostor feelings are logically defensible. However, the time has come to carefully review the empirical literature on the associations between perfectionism and impostor feelings for at least three reasons. First, a rapid scan of this literature reveals the presence of inconsistent findings with studies reporting positive (e.g., Berry et al., 2021), null (e.g., Vergauwe et al., 2015), and negative (e.g., Wang et al., 2019) correlations between perfectionistic standards and impostor feelings. The association

between perfectionism and impostor feelings appears to be far more intricate than initially thought.

Second, perfectionism is a complex multidimensional construct. Researchers typically differentiate between *perfectionistic standards* and *perfectionistic concerns* (for a review, see Smith et al., 2022). *Perfectionistic standards* have recently been theorized as the core definitional feature of perfectionism (Gaudreau, 2021). This dimension represents the tendency to aim and strive toward extremely high and rigid standards and to evaluate oneself accordingly. It has been measured with subscales measuring self-oriented perfectionism (Hewitt & Flett, 1991), rigid perfectionism (Smith et al., 2016), and high personal standards (Frost et al., 1990; Slaney et al., 2001). Standards of perfection often come along with *perfectionistic concerns*, which entail the many evaluative concerns, personal doubts, and intolerance for imperfections experienced by the perfectionists. It has been measured with subscales measuring concerns over mistakes, doubts about action (Frost et al., 1990), self-critical perfectionism (Smith et al., 2016), socially prescribed perfectionism (Hewitt & Flett, 1991), and discrepancy (Slaney et al., 2001). The conceptual landscape of perfectionism contains other signature expressions worthy of further delineation (Gaudreau, 2021; Hewitt et al., 2017). *Automatic thoughts and cognitions* about the need to be perfect are often experienced by individuals who aim and strive toward perfection (Flett et al., 2007). Perfectionists also rely on *self-presentation tactics* in which they try to project and promote an image of perfection while avoiding the display and disclosure of their imperfections to others (Hewitt et al., 2003). People can also impose their perfectionism on others through *narcissistic expressions of their perfectionism* (e.g., Smith et al., 2016). Whether each of these characteristics of perfectionism displays a comparable association with impostor feelings is a level of nuance that requires further empirical scrutiny.

Third, a recent theory has been developed to clarify the territorial domain of *perfectionistic standards*. According to the Model of Excellencism and Perfectionism (MEP; Gaudreau, 2019), the conceptual domain of perfectionism starts where the conceptual domain of excellencism ends. Many people pursue high standards flexibly and reasonably. People who are excellence strivers need to be differentiated from those who pursue perfection. In that sense, the MEP redefines perfectionism as the tendency to “aim and strive toward idealized, flawless, and excessively high standards in a relentless manner” (Gaudreau, 2019, p. 200). Growing empirical studies have provided support for the conceptual distinctiveness of excellencism and perfectionism and their distinct associations with performance, emotional, and motivational outcomes (for a review, see Gaudreau et al., 2023).

Osenk and colleagues (2020) recently performed a meta-analysis in which the educational outcomes of perfectionism were reexamined using the distinction between perfectionistic standards and excellencism. Past measures of perfectionism were used as proxies to differentiate perfectionism and excellencism. Table 1 shows how different measures can be reorganized into the conceptual landscape of perfectionism and excellencism. Our goal, in categorizing some measures of perfectionism into proxies of excellencism, is not to criticize the seminal work of researchers. Developing and validating measures of psychological constructs is a complex and ongoing journey (e.g., Haynes et al., 1995). It was only recently that researchers noticed that the wording of items from perfectionism measures has conceptual implications (Blasberg et al., 2016). Paying attention to these subtle, yet non-trivial distinctions, offers a new light to reexamine the associations between perfectionistic standards and psychological outcomes such as impostor feelings.

As shown in Table 1, proxy measures of perfectionism are characterized by a majority of items measuring the tendency to aim and strive toward perfection. In contrast, proxy measures of excellencism are those in which most items measure the aiming and striving toward high standards. The dimension of *rigid perfectionism* measured in the Big Three Perfectionism Scale (Smith et al., 2016) can be taken as a pure measure of perfectionistic standards. The subscale of *self-oriented perfectionism* (Hewitt & Flett, 1991) contains some items alluding to high rather than perfectionistic standards (Blasberg et al., 2016), but it can nonetheless be seen as predominantly measuring perfectionistic standards. Conversely, measures of *personal standards* and *high standards* from two popular perfectionism questionnaires (Frost et al., 1990; Slaney et al., 2001) were reconsidered as indicators of excellencism – consistent with the meta-analysis of Osenk and colleagues (2020). For example, these two questionnaires include many items that more closely match the conceptual domain of excellencism. Aiming and pursuing high standards does not capture the definitional features of perfectionism. Plus, they contain no item that makes explicit reference to aiming, pursuing, or evaluating oneself based on perfection. Finally, despite its name, a measure of *striving for excellence* (Hill et al., 2004) should also be repositioned as an indicator of perfectionistic standards because a majority of items (e.g., my work needs to be perfect) are worded in ways that capture the pursuit of perfection rather than the pursuit of excellence. Even the operational definition of Hill and colleagues (2004) for this subscale reflected an intention to measure the pursuit of perfect results. Scores on this subscale correlated strongly with other measures of self-oriented perfectionism and signature expressions of perfectionism (e.g., Hill et al., 2004; Stairs et al., 2012). Based on this conceptual organization, previously used by Osenk and colleagues (2020), our current meta-analysis reexamined the

Table 2.1*Categorization of Perfectionistic Standards Measures as Proxies of Perfectionism and Excellencism*

Measure	Subscale	Examples
Proxy measures of perfectionistic standards		
BTPS	Rigid perfectionism	10 items. 10 directly refer to perfectionism (“...strong need to be perfect”).
HF-MPS	Self-oriented perfectionism	15 items. 8 directly refer to perfectionism (“... important that I am perfect in everything”). 4 capture the essence of perfectionism (“... must work to my full potential”). 3 can be interpreted as high standards (“... very high standards”; ... “very high goals”).
PI	Striving for excellence	6 items. 3 directly refer to perfectionism (“... achieve flawless results”; “... can’t... do something halfway”). 1 captures the essence of perfectionism (“... be the best in every assignment”). 2 refer to high standards but pursued in a relentless manner that characterizes perfectionism (“... must achieve excellence in everything”; “... drive myself rigorously to achieve high standards”).
SCOPE	Perfectionism	11 items. 9 directly refer to perfectionism (“... be a perfect person”; “... have perfect performances”). 2 capture the essence of perfectionism (“... be exceptionally productive all the time”; “... produce error-free work”).
Proxy measures of excellencism		
SCOPE	Excellencism	11 items that refer to aiming and pursuing high standards of excellence (“... perform very well”; “... work very hard until I reach excellence”).
F-MPS	Personal standards	7 items. 0 directly refers to perfectionism. 2 items capture the essence of perfectionism (“... if I do not set the highest standards... end up a second-rate person”; ... be thoroughly competent in everything I do”). 5 items refer to aiming and pursuing high standards (“... set higher goals than most people”; ... expect higher performance... than most people”; “very good at focusing my efforts on attaining a goal”).
APS	High standards	7 items. 0 directly refers to perfectionism. 3 items capture the essence of perfectionism (“... if you don’t expect much of yourself, you will never succeed”; “... expect the best of myself”; “... try to do my best at everything”). 4 items refer to aiming and pursuing high standards (“...strong need to strive for excellence”; “... high standards”; “... high expectations of myself”; “... set very high standards”).

Note. BTPS = Big Three Perfectionism Scale. HF-MPS = Hewitt & Flett Multidimensional Perfectionism Scale. PI = Perfectionism Inventory.

SCOPE = Scale of Perfectionism and Excellencism. F-MPS = Frost Multidimensional Perfectionism Scale. APS = Almost Perfect Scale.

results of past studies to differentiate the associations of the experience of impostor feelings with proxy measures of perfectionistic standards and excellencism.

This Research

We conducted three studies to determine if excellencism and perfectionism are differentially associated with impostor feelings. In Study 1, we performed a meta-analytical review of the published studies that previously looked at the correlations between perfectionism and impostor feelings. In Study 2 and Study 3, we conducted original studies with two independent samples of graduate students. The meta-analytical review informed specific goals and hypotheses of these studies, and they will be described after the meta-analysis.

Study 1

A bird's eye view of the literature reveals inconsistencies in the association between perfectionism and impostor feelings. On the one hand, our meta-analysis took a multidimensional perspective and differentiated perfectionistic concerns and perfectionistic standards. We also incorporated perfectionistic cognitions, self-presentation tactics, and narcissistic expressions of perfectionism. In the MEP, these characteristics have all been repositioned as signature expressions of perfectionism enacted by people with perfectionistic standards (Gaudreau, 2021). As such, the MEP conceptualizes perfectionistic standards as the core definitional feature of perfectionism or the nucleus that fuels the enactment of perfectionistic concerns, self-presentation, and cognitions. In turn, these signature expressions of perfectionism are taken to be the more proximal predictors of psychological maladjustment. This reformulation is in line with meta-analyses that consistently showed that perfectionistic concerns are positively tied with perfectionistic standards but more strongly associated with psychological maladjustment than perfectionistic standards (e.g., Limburg et al., 2017; Smith et al., 2021).

Given these arguments, we expected that many of the signature expressions of perfectionism (i.e., concerns, cognitions, self-presentation) would be more strongly associated with impostor feelings.

On the other hand, the MEP draws a clear conceptual distinction between people who pursue excellence and those who pursue perfection. Using the approach previously used by Osenk and colleagues (2020), as detailed in Table 1, we tried to determine if proxy measures of excellencism (i.e., high standards) and proxy measures of perfectionistic standards (e.g., self-oriented perfectionism) differentially correlated with impostor feelings. Theoretical arguments that tie back impostor feelings to perfectionism do not apply to excellencism. As a result, we expected that the positive correlations between the proxies of perfectionistic standards and impostor feelings would not generalize to the proxies of excellencism.

Method of the Meta-Analysis

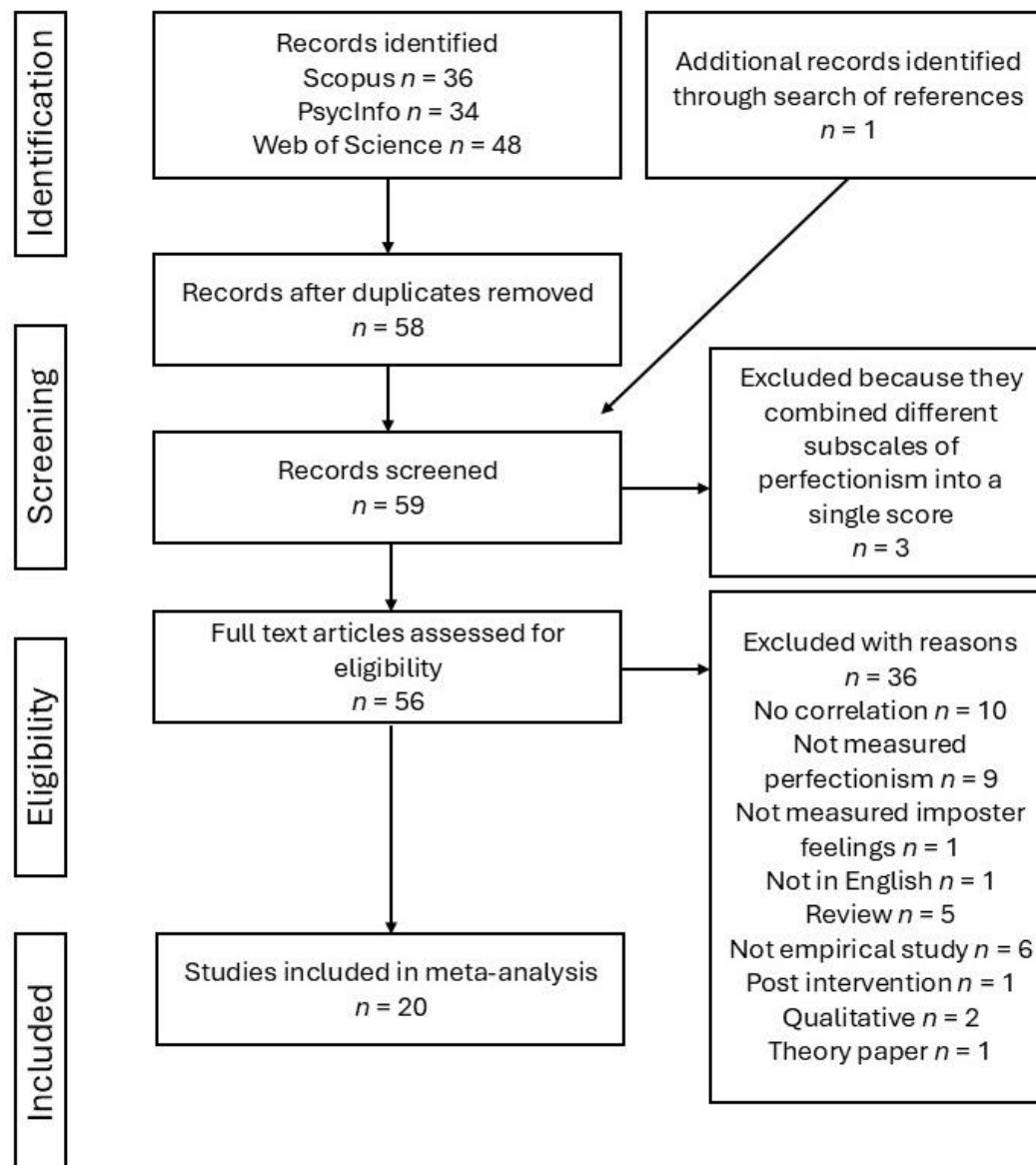
Data Search and Inclusion Criteria

We searched the published studies on the correlations between perfectionism and the experience of impostor feelings using three electronic databases. We restricted our search to (a) published articles (b) written in English (c) between 1990 and January 2024. Our review started in 1990 to focus on studies conducted after the publication of the first two multidimensional questionnaires on perfectionism. We did not search the unpublished literature due to the limited resources (i.e., staff, time, funding) available to perform this meta-analysis. The following keywords were used in the three databases: *perfectionism and impostor OR perfectionism and imposter*. A total of 36, 34, and 48 articles were identified on SCOPUS, PsycInfo, and Web of Science. The database search resulted in the identification of 58 unique articles after the exclusion of duplicates. An additional article was identified by looking at the list of references

from the studies. Overall, 59 articles (60 unique samples) were considered for the meta-analysis (see Figure 1).

Figure 2.1

PRISMA Flowchart of Studies in the Meta-Analysis



We excluded three studies (4 samples) because they combined subscales of perfectionistic standards and concerns into a unidimensional score of perfectionism (Cusack et al., 2013; Liu et al., 2023; Pákozdy et al., 2023). We also excluded some variables known to be developmental antecedents of perfectionism (i.e., parental expectations and pressure; Curran & Hill, 2022) or conceptually unrelated to the conceptual domain of perfectionism (i.e., organization; Stoeber, 2018).

To be included, a study also had to report (d) the sample size and (e) the correlation(s) between measures of perfectionism and impostor feelings. One study that did not report the correlations was nonetheless included because we were able to calculate the correlations using Open Access Data posted on a public repository (Leonhardt et al., 2017). Intervention studies were included only if correlations were available before the intervention. No restriction was imposed regarding the age of the participants.

Screening and Data Extraction

All articles were downloaded and read by the third author. Reasons for exclusions were noted in an Excel sheet (available at OSF link at the end of the method section) and summarized in Figure 1. A total of 20 articles met our inclusion criteria and were included in the meta-analysis. The third author extracted the following information from each of the 20 articles: (a) name of authors, (b) year of publication, (c) name of the impostor feelings measure, (d) name of the perfectionism measure(s) and subscale(s), (e) sample size used to estimate the correlation(s), (f) percentage of females in the sample, (g) name of the country/countries where the study was conducted, and (h) bivariate correlation(s) between impostor feelings measure(s) and subscales(s) of perfectionism. The second author double coded all the information extracted from the 20 samples. No error was detected during double coding.

Plan of Analysis

We conducted our analyses using Comprehensive Meta-Analysis Version 2.2 (Borenstein et al., 2007). Some studies reported more than one correlation. In this case, the effect sizes were averaged to ensure that only one independent effect size was included in any given analysis.

We performed separate analyses for the indicators of signature expressions of perfectionism and perfectionistic standards. The first analysis was subsequently divided into more precise analyses looking at (a) concerns over mistakes, doubts about actions, and self-critical perfectionism, (b) socially prescribed perfectionism, (c) discrepancy, and (d) narcissistic expressions of perfectionism. As shown in Table 1, the analysis of perfectionistic standards was subsequently divided into more specific analyses for the (a) proxy measures of perfectionistic standards (i.e., rigid perfectionism, self-oriented perfectionism, striving for excellence) and (b) the proxy measures of excellencism (i.e., high standards, excellencism).

A random-effects meta-analysis was selected and performed using correlation effect size with proper procedures for transformation (r to Fischer Z and back to r). We reported the summary effect size, the 95% confidence intervals, and the exact p -value. We relied on Q (and its associated p -value) and I-squared statistics to estimate the heterogeneity of the summary effects. Whereas Q assesses the statistical significance of the estimated effect size heterogeneity, the I-squared index calculates “what proportion of the observed variance reflects real differences in effect size” (Borenstein et al., 2007, p. 117). Values of 25%, 50%, and 75% are considered low, moderate, and high, respectively (Higgins et al., 2003).

The Orwin fail-safe sample size was computed as a way of ruling out publication bias. The fail-safe N denotes the number of unpublished studies with null results that would be needed to reduce a statistically significant meta-analytic result to a trivial value (defined herein as $r =$

.10; Rosenberg, 2005). We also perform p-curve analysis to examine if the distribution of significant correlations ($p < .05$) contained lower p values (e.g., $p < .001$) than p values nearing statistical non-significance (e.g., $p = .049$). Curves with a right-skewed distribution are indicative of evidential value and suggest that the meta-analytical findings are unlikely to be explained solely by selective reporting, p-hacking, or false positives (Simonsohn et al., 2014). We interpreted both the full p-curve (i.e., all significant correlations included) and the half p-curve (i.e., including only the correlations with small p values ranging from 0 to .025). Finding that both the full and the half p-curves are right-skewed provides additional support for the evidential value of the meta-analytical findings (Simonsohn et al., 2015). The curves were tested using the online p-curve app version 4.10 available at: <https://www.p-curve.com/app4/>

Open Science Statement

The list of articles and reasons for exclusion, as well as the screenshot of analyses performed in the Comprehensive Meta-Analysis software, are available at OSF LINK: https://osf.io/c7h6w/?view_only=350332723f904557b1b9a1c2977911ef

Results

Descriptive summary of the studies

We present the 20 studies included in our meta-analysis in Table 2. Most studies used the Clance Impostor Phenomenon Scale (CIPS; $k = 16$; Clance, 1985), followed by the Leary Impostor Phenomenon Scale (LIPS; $k = 3$; Leary et al., 2000), and the Imposter Phenomenon Assessment (IPA; $k = 1$; Walker & Saklofske, 2023). Studies measured perfectionism with one or many of the questionnaires: Frost Multidimensional Perfectionism Scale (F-MPS; $k = 7$; Frost et al., 1990), Hewitt and Flett Multidimensional Perfectionism Scale (HF-MPS; $k = 5$; Hewitt & Flett, 1991), the long or short version of the Almost Perfect Scale

Table 2.2

Study 1. Studies Included in the Meta-Analysis

Authors	Sample	N	%		Countries	IP	Perfectionism	Perfectionistic standards	Signature expressions of perfectionism	
			Female							
Bernard et al. (2020)	Black undergrad students	266	77		USA	CIPS-20	F-MPS		N=266	CM = .53
Berry et al. (2021)	Graduate students	3352	65.8		UK	CIPS	APS-Short	N=2762 HS = .20	N=2766	DISC = .67
Brenan-Wydra et al. (2021)	Medical students	226	53.1		USA	Leary-7	APS-Short		N=226	DISC = .64
Cokley et al. (2018)	Undergraduate students	468	56		USA	CIPS-20	APS-R	N=468 HS = -.05	N=468	DISC = .65
Cowie et al. (2018)	Graduate students	269	52.4		Canada	CIPS-20	HF-MPS; PSPS	N=269 SOP = .26	N=269	SPP = .48; OOP = .12; PSPS = .41
Dudau et al. (2014)	Undergraduate students	129	85		Romania	CIPS-20	PI	N=129 Striving = .02	N=129	CM = .62; HS for others = .14
Ferrari & Thompson (2006, Study 1)	Undergraduate students	165	68.4		USA	CIPS-20	PCI; PSPS		N=165	PSPS = .38; PCI = .59
Fleischhauer et al. (2021)	Young adults (62% university students)	209	79		Germany	CIPS-20	HF-MPS-Short	N=209 SOP = .19	N=209	SPP = .52
Gaudreau et al. (2022, Study 2, Sample 2)	Young adults (45% workers)	340	48.6		USA, UK, Canada	Leary-4	SCOPE	N=340 EXCEL = -.08; PERFECT = .12		
Holden et al. (2021)	62% of undergraduate students	325	78.9		USA	Leary-7	HF-MPS	N=325 SOP = .09	N=325	SPP = .45; OOP = -.04
Lee et al. (2021)	Undergraduate students	244	77.86		USA	CIPS-20	HF-MPS	N=244 SOP = .30	N=244	SPP = .50
Leonhardt et al. (2017)	Employees in leadership position	186	36.77		Germany	CIPS-20	F-MPS	N=186 HS = .11	N=186	CM = .56
Liu et al. (2023)	Undergraduate students	227	77.5		USA	CIPS-20	F-MPS		N=227	CM + DAA = .57
Pannhausen et al. (2022)	Young adults (38% workers)	274	79.1		Germany	CIPS-20	F-MPS; HF-MPS	N=274 HS = .25; SOP = .28	N=274	CM =.67; DAA = .67; SPP = .51; OOP = .12
Rohrmann et al. (2016)	Employees in leadership position	242	37		Germany	CIPS-20	F-MPS	N=242 HS = .21	N=242	CM = .57
Thomspon et al. (2000)	Undergraduate students	318	81.7		USA	CIPS-20	F-MPS		N=318	CM = .60
Tigranyan et al. (2021)	Graduate students in psychology	84	88		USA	CIPS-20	PCI		N=84	PCI = .65
Vergauwe et al. (2015)	Workers	201	58		Belgian	CIPS-16	F-MPS	N=201 HS = .03	N=201	CM + DAA = .62
Walker et al. (2023, Study 3)	Undergraduate and graduate students	562	69		Canada	IPA-54	BTPS	N=562 Rigid = .31	N=562	Critical = .66; Narcissistic = .12
Wang et al. (2019)	University students	169	70.4		Russia	CIPS-20	APS-Short	N=169 HS = -.16	N=169	DISC = .55

Note. HS = High standards. SOP = self-oriented perfectionism. Excel = excellencism. Perfect = perfectionistic standards from the SCOPE. Rigid = rigid perfectionism. Striving = perfectionistic striving. CM = concerns over mistakes. DISC = discrepancy. SPP = socially prescribed perfectionism. OOP = other-oriented perfectionism. PSPS = perfectionistic self-presentation. PCI = perfectionistic cognitions. DAA = doubts about actions. Narcissistic = narcissistic perfectionism.

(APS; $k = 4$; Slaney et al., 2001), the Perfectionism Self-Presentation Scale (PSPS; $k = 2$; Hewitt et al., 2003), and the Perfectionism Cognitions Inventory (PCI; $k = 2$; Flett et al., 2007). The Big Three Perfectionism Scale (BTPS; Smith et al., 2016) and Scale of Perfectionism and Excellencism (SCOPE; Gaudreau et al., 2022) were each used in only one study.

The sample size ranged from 84 to 3352 participants. Studies mainly recruited students ($k = 14$) and young adults (a mixture of students and employees, $k = 3$). Only three samples recruited employees. Most studies recruited samples in the USA, United Kingdom, and Canada ($k = 13$) with four additional studies in Germany and three in Belgium, Russia, and Romania, respectively. Finally, 17 studies recruited a higher proportion of females. Of the 8256 participants included in the meta-analysis, 66% identified as females.

Meta-Analysis of the Signature Expressions of Perfectionism

A total of 28 correlations were extracted across 19 studies. As shown in Table 3, the signature expressions of perfectionism were strongly associated with impostor feelings ($r = .536$), but this effect size was largely heterogeneous ($I^2 = 91\%$). Our subsequent analyses indicated that perfectionistic concerns ($r = .606$), discrepancy ($r = .644$), and perfectionistic cognitions ($r = .611$) were the largest contributors to the positive and strong association with impostor feelings. Socially prescribed perfectionism ($r = .489$) and perfectionistic self-presentation ($r = .399$) showed a strong but weaker correlation with impostor feelings, whereas narcissistic expressions of perfectionism were only negligibly associated ($r = .088$).

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We performed a p-curve analysis based on the 19 studies that found a significant correlation ($p < .05$) between signature expressions of perfectionism and impostor feelings. The full ($Z = -30.40, p < .0001$) and the half p-curves ($Z = -29.94, p < .0001$) were right-skewed (Power = 99%; see Figure S1 in the supplementary file). The meta-analytical findings for the signature expressions of perfectionism are unlikely to be explained solely by selective reporting, p-hacking, or false positives.

Meta-Analysis of Perfectionistic Standards

A total of 16 correlations were extracted across 14 studies. As shown in Table 3, perfectionistic standards were significantly but weakly associated with impostor feelings ($r = .135$), but this effect size was largely heterogeneous ($I^2 = 85\%$). Proxy measures of perfectionism (e.g., self-oriented perfectionism, striving, rigid perfectionism) were more strongly associated with impostor feelings ($r = .205$). Conversely, proxy measures of excellencism (e.g., high

standards) were not significantly associated with impostor feelings ($r = .068$). Among those variables, the high standards measured with the APS showed the weakest associations with impostor feelings ($r = .005$).

We performed a p-curve analysis based on the 10 studies that found a significant correlation ($p < .05$) between perfectionistic standards and impostor feelings. The full ($Z = -3.39$, $p = .0003$) and the half p-curves ($Z = -4.04$, $p < .0001$) were right-skewed (Power = .63%; see Figure S2 in the supplementary file). The meta-analytical findings for perfectionistic standards are unlikely to be explained solely by selective reporting, p-hacking, or false positives.

Brief Discussion

The results of our meta-analysis indicated that the theoretically expected association between perfectionism and impostor feelings needs to be interpreted with nuance. Findings were consistent with fundamental distinctions advanced in the MEP (Gaudreau, 2019, 2021).

First, the pursuit of the high personal standards implied in excellencism and the pursuit of perfectionistic standards are distinctively associated with impostor feelings. Proxies of excellencism were not significantly associated with impostor feelings. Conversely, measures taken as proxy indicators of perfectionistic standards showed a significant and moderate correlation with impostor feelings. These results are noteworthy because they confirm the need to meticulously distinguish excellencism and perfectionism to estimate their respective associations with impostor feelings correctly.

Second, signature expressions of perfectionism were significantly and more strongly correlated with impostor feelings. These findings are consistent with past meta-analyses showing that perfectionistic concerns are stronger predictors of psychological maladjustment than perfectionistic standards (e.g., Limburg et al., 2017; Smith et al., 2021). This is consistent with

Table 2.3*Study 1. Results of the Meta-Analysis of the Correlation Between Perfectionism and Impostor Feelings*

Variables	<i>k</i>	<i>N</i>	<i>r</i>	95% <i>CI</i>	<i>Q</i>	<i>I</i> ²	<i>Fail-Safe</i> <i>N</i> ^a	<i>EPI</i>
Signature expressions of perfectionism	19	7330	.536**	[.474, .593]	198.88**	90.95	108	[-7.02, -1.00]
(1) All, except narcissistic expressions	19	7330	.580**	[.541, .616]	87.73**	79.48	117	[-5.01, -1.49]
(2) Concerns, doubts, and rigid	9	2405	.606**	[.571, .638]	13.42	40.39	55	[-7.76, 1.65]
(3) Discrepancy	4	3629	.644**	[.604, .682]	6.34	52.71	28	[-5.60, 1.46]
(4) Socially prescribed perfectionism	5	1321	.489**	[.447, .529]	1.46	0.00	22	[-0.84, 13.45]
(5) Perfectionistic cognitions	2	249	.611**	[.526, .684]	0.52	0.00	NA	NA
(6) Perfectionistic self-presentation	2	434	.399**	[.316, .475]	0.13	0.00	NA	NA
(7) Narcissistic expressions	5	1559	.088*	[.021, .154]	6.79	41.12	11 ^b	[-9.17, 9.73]
Perfectionistic standards	14	6380	.135**	[.066, .204]	83.80**	84.49	10	[-4.90, 1.34]
(1) Proxies of perfectionism	8	2352	.205**	[.131, .277]	23.34**	70.01	11	[-11.81, 3.44]
(2) Proxies of excellencism	8	4642	.068	[-.040, .175]	66.44**	89.46	55 ^b	[-7.82, 1.21]
(3) APS – high standards	3	3399	.005	[-.219, .228]	42.38**	95.28	12 ^b	[-27.36, 12.86]
(4) F-MPS – high standards	4	903	.156**	[.057, .252]	6.92	56.66	3	[-39.58, 9.62]

Note. ^a The number of non-significant effects needed to bring the correlation below .10. ^b The number of non-significant effects

needed to bring the correlation to zero.

the idea that perfectionistic standards and their signature expressions are, respectively, distal and proximal predictors of psychological adjustment (Gaudreau, 2021; Gaudreau et al., 2023).

Overall, this result provided the first meta-analytical support for this novel position forwarded by the MEP.

Third, it is interesting to report that not all signature expressions were equally correlated with impostor feelings. It appears that cognitive expressions, such as concerns and doubts, are more closely linked to impostor feelings than social and behavioural expressions, such as socially prescribed perfectionism and perfectionistic self-presentation. Furthermore, imposing perfectionism and being overly critical of others were only negligibly linked to impostor feelings. Overall, this offers novel grounding to the MEP assumption concerning the idea that distinct expressions of perfectionism could be differentially involved in psychological maladjustment (e.g., Gaudreau, 2021).

Finally, four limitations need to be reported. First, this meta-analysis only included published studies. Therefore, it remains uncertain whether the inclusion of unpublished studies would have changed the estimate of the effect size and the conclusions of our meta-analytical review. Second, most studies were conducted with university students and workers (see Table 1). Because no studies were identified with children, adolescents, or older adults, the results of this meta-analysis should not be generalized to younger or ageing populations, for which future empirical attention will be required. Third, studies reviewed in our meta-analysis were categorized to represent proxy measures of perfectionistic standards and excellencism. Only one study relied on the SCOPE, which is a measure formally designed to differentiate perfectionism and excellencism. Results of our meta-analysis should be interpreted as evidence for proxy measures of excellencism rather than excellencism itself. Finally, p-curve analyses revealed that

the findings are not solely attributable to publication bias, p-hacking, or questionable research practices. However, the power of the p-curve analysis was lower for the perfectionistic standards meta-analysis (63%) than for signature expressions (99%). Plus, only 10 studies would be needed to turn the association between perfectionistic standards and impostor feelings to trivial values ($r < .10$). All considered, we conclude that the meta-analysis has evidential value. Still, the results should be interpreted with caution, given the small number of studies that previously looked at the association between perfectionism and impostor feelings.

Study 2

In Study 1, we relied on proxy measures and showed that excellencism and perfectionism are distinctively associated with impostor feelings. In Study 2, our goal was to directly test this hypothesis using the SCOPE – a measure specifically developed to separate the high standards of excellencism and the defining standards of perfectionism. Based on the SCOPE, the results of a multiple regression conducted with a sample of undergraduate students revealed that excellencism and perfectionism were negatively and positively associated with the experience of impostor feelings (Gaudreau et al., 2022). As recently detailed in a tutorial designed to create a pathway between theory and research (Gaudreau, Schellenberg, et al., 2024), these effects can be reinterpreted to compare the outcomes of nonexcellence/nonperfection strivers (i.e., low excellencism and perfectionism), excellence strivers (i.e., high excellencism and low perfectionism), and perfection strivers (i.e., high excellencism and perfectionism). In the study of Gaudreau and colleagues (2022), impostor feelings were significantly lower among excellence strivers compared to both nonexcellence/nonperfection strivers and perfection strivers. In Study 2, we aimed to determine if these effects generalize to a sample of graduate students.

Impostor feelings can be triggered by a mix of dispositional and situational factors (e.g., Leary et al., 2000; Canning et al., 2019; Gullifor et al., 2023). Failure to account for situational factors could potentially explain why the meta-analytical associations between perfectionism and impostor feelings were heterogeneous in Study 1. Studies included in the meta-analysis have primarily focused on university students, particularly undergraduate students, and Study 2 explored how the particular context of graduate education can influence the association between perfectionistic standards and impostor feelings.

Gaining admission to graduate school requires effort, dedication, and perseverance over many years of hard work. Students admitted to graduate school have successfully faced several challenges in their quest to complete many demanding university courses and milestones. They were carefully selected through a competitive admission process in which high-achieving students compete against each other. Those admitted ranked among the top students in their field (Jones et al., 2020). In the context of such repeatable and stellar academic achievements, it seems paradoxical to hear so many stories of students grappling with a lack of self-confidence and feelings of unworthiness in their role as graduate students (Devos et al., 2017; Jaremka et al., 2020). Feeling like a fraud or an impostor and being afraid that others will soon discover one's true lack of academic abilities, appear to be a shared psychological experience among many graduate students (e.g., Tigranyan et al., 2021). In graduate school, we hypothesized that perfection strivers would experience more impostor feelings than excellence strivers.

Graduate students work in a stressful and competitive environment marked by high research demands (Gardner, 2008; Marshall et al., 2008). The pressure to produce novel and significant research while managing many competing responsibilities can leave many students doubting their capacity to be successful. Insufficient research productivity and not feeling as

proficient as other students can be stressful experiences for graduate students (Cornwall et al., 2019). Similarities can be drawn with other achievement-intensive environments (e.g., sports, performance arts) in which many skillful performers compete against each other in their pursuit of success and recognition. One challenge with perfection strivers is that their sense of self is contingent on their achievement (e.g., Egan et al., 2016). They also tend to internalize and overgeneralize failures; when they fail, they feel like complete failures (Ellis, 2002). Based on these arguments, it is possible to assert that the positive association between perfectionistic standards and the experience of impostor feelings is potentially exacerbated for graduate students who are the least satisfied with their academic productivity.

A recent MEP study examined the moderating role of subjective athletic achievement in the associations of excellencism and perfectionism with sports enjoyment (Gaudreau, Schellenberg, et al., 2024). Among athletes who reported high levels of athletic goal attainment, the difference between perfection strivers and excellence was not statistically significant. Good performances boosted the enjoyment of perfection strivers. Among athletes who reported lower athletic goal attainment, sports enjoyment was significantly lower for the perfection strivers compared to the excellence strivers. The psychological wellness of perfection strivers appears to be dependent on their capacity to be successful. This is an important theme in the perfectionism literature (e.g., Crocker et al., 2014; Waleriańczyk et al., 2023), and our goal in Study 2 was to explore if a similar pattern of effects would emerge among graduate students who reported differing levels of satisfaction with their research productivity. As such, we anticipated that among graduate students with *lower satisfaction with their research productivity*, perfection strivers would experience greater impostor feelings compared to excellence strivers. Additionally, we expected that the association of perfectionism with the experience of impostor

feelings (i.e., the difference between excellence and perfection strivers) would be attenuated for graduate students expressing *higher levels of satisfaction with their research productivity*.

Method

Open Science Statement (applies to Studies 2 and 3)

The hypotheses of this study were not preregistered but followed the open access and peer-reviewed analytical plan of the MEP (Gaudreau, Schellenberg, et al., 2024). The data, material, and scripts required to conduct the analyses in Studies 2 and 3 can be accessed at:

https://osf.io/c7h6w/?view_only=350332723f904557b1b9a1c2977911ef

Participants and Procedure.

A total of 376 graduate students were recruited on Prolific Academic as part of a larger research program looking at the psychological experience of graduate students (reference masked for peer review). Our goal was to recruit enough participants (minimal $n = 343$) to reach the statistical power threshold of 80% (two-tailed p -value $< .05$) for a bivariate correlation of .15 (i.e., like the estimate of perfectionistic standards in Study 1). Two multivariate outliers ($\chi^2 > 18.47$, $df = 4$, $p < .001$) and two univariate outliers ($z < -3$ on excellencism) were removed from our analyses ($N = 372$). Participants were from 20 to 50 years of age ($M = 25.76$, $SD = 5.28$), with 56.7% identifying as males, 42.1% as females, and 1.1% as others. Graduate students were enrolled in diverse universities across 25 countries such as Portugal (27.3%), United Kingdom (14%), Poland (12.3%), Italy (8.5%), United States (8.1%), Greece (6.7%), Spain (6.2%), Canada (3.5%), Mexico (3.2%), and other countries (10.9%). Also, the participants identified their ethnicity as White (78.5%), Latino (7.4%), Middle Easterner (2.9%), Black (2.7%), South Asian (2.4%), East Asian (2.1%), African (1.1%), multicultural (1.6%), or another cultural background (1.3%). Most participants were enrolled in a master's program (80.9%), as opposed

to a doctoral program (17.9%) or a combined master-doctoral program (1.3%). Most were enrolled as full-time graduate students (69.4%), rather than being registered in part-time education (29.8%), and very few were awaiting graduation (0.8%). Lastly, the largest proportion of graduate students was in their first year (33.7%) or in their second year (31.8%), as compared to their third year (15.5%), fourth year (8%), and in their fifth or more year (11%) of their program.

To be eligible, participants needed to be actively enrolled in a graduate program (e.g., Master's, Ph.D., or Doctorate studies). Those who did not meet this requirement were excluded from participating in the study. Upon providing their electronic written consent, the participants had to complete a 15-minute survey on Qualtrics. Each participant was given a small monetary compensation of 3.85 CAD for completing the study. This research was authorized by the University of MASKED FOR REVIEW Research and Ethics Board.

Measures

Impostor feelings. Impostor feelings were measured using four items taken from Canning and colleagues (2019), which were originally adapted from the Leary Impostor Scale (LIS; Leary et al., 2000). Graduate students were asked to reflect on their experiences since the start of their graduate program and assess their level of agreement using a 7-point scale ranging from 1 (*not at all agree*) to 7 (*totally agree*) on items such as “I feel like an impostor”. Scores of the LIS are internally consistent ($\alpha=.87$; Leary et al., 2000), and similar evidence was also reported more recently by Canning and colleagues (2020; $\alpha=.86$). The score with our sample of graduate students showed high internal consistency ($\omega = .90$). Results of a confirmatory factor analysis (with the WLSMV estimator) showed that most fit indices were in favour of the proposed unidimensional structure of the LIS ($\chi^2 = 26.49$, $df = 2$, $p < .001$, CFI = .995, TLI =

.985, RMSEA = .181, SRMR = .013) with standardized factor loadings ranging from .76 to .94. For a unidimensional model with few items, the RMSEA can make it look like the model fit is poor even when the model is correct. RMSEA should not be overinterpreted in such contexts (Kenny et al., 2015), particularly when the items show high levels of internal consistency (McNeish et al., 2018).

Perfectionism and excellencism. We measured perfectionism and excellencisms with the Scale of Perfectionism and Excellencism (SCOPE; Gaudreau et al., 2022). Participants were asked to evaluate the extent to which each item corresponds to their general goal in life using a 7-point scale from 1 (*not at all agree*) to 7 (*totally agree*). Excellencism (e.g., have very good performance) and perfectionism (e.g., "...have perfect performances"). Items of excellencism and perfectionism have been found to load on separate factors in exploratory and confirmatory factor analyses (e.g., Gaudreau et al., 2022; Tape et al., 2024). Scores of both perfectionism ($\alpha=.98$) and excellencism ($\alpha=.98$) showed high internal consistency in previous studies (e.g., Goulet-Pelletier et al., 2022). The scores in our sample of graduate students were highly internally consistent for both excellencism ($\omega = .92$) and perfectionism ($\omega = .96$). Results of a confirmatory factor analysis (e.g., CFI = .974) performed on the current sample of graduate students provided evidence for the proposed factor structure of the SCOPE (masked for peer review).

Satisfaction with scientific productivity. Using a scale from 1 (*not at all satisfactory*) to 7 (*totally satisfactory*), graduate students reported how they perceived their level of scientific productivity by answering this question: Considering the year into your program (and comparing yourself to other students in your field), how would you rate your level of scientific productivity?

Single items are frequently used to reliably measure performance and job satisfaction (e.g., Allen et al., 2022; Fakunmoju, 2020).

Plan of Analyses

We used MPlus 8.10 (Muthén & Muthén, 2024) with the maximum likelihood robust estimator in all our analyses. We followed the peer-revised open access plan of analysis typically used to test the hypotheses of the MEP (Gaudreau, Schellenberg, et al., 2024). In our first analysis, we performed a multiple regression to estimate the main effects of excellencism and perfectionism on impostor feelings. A significant beta for excellencism can be taken as evidence that excellence strivers differ from nonexcellence/nonperfection strivers. A significant beta for perfectionism indicates that perfection strivers differ from excellence strivers. Using the intercept and unstandardized betas, we calculated the predicted values of the dependent variables for (a) nonexcellence/nonperfection strivers (i.e., a person with low excellencism and perfectionism), (b) excellence strivers (i.e., a person with high excellencism and low perfectionism), and (c) perfection strivers (i.e., a person with high excellencism and perfectionism). These predicted values are calculated using the multiple regression equation and do not require participants to be categorized into groups. The predicted values can be calculated and graphed using the MEP Shiny App (https://model-of-excellencism-and-perfectionism.shinyapps.io/Shiny_Version2/) published by Gaudreau and colleagues (2024). In all our analyses, the predictors were centred for ease of calculating the predicted values and effect size. In both Mplus and the Shiny App, these equations are used to calculate the predicted values:

$$(a) \text{ Predicted value of impostor feelings for nonexcellence/nonperfection strivers} = b_0 + b_1 (-1SD \text{ of excellencism}) + b_2 (-1SD \text{ of perfectionism}).$$

(b) Predicted value of impostor feelings for excellence strivers = $b_0 + b_1 (+1SD \text{ of excellencism}) + b_2 (-1SD \text{ of perfectionism})$.

(c) Predicted value of impostor feelings for perfection strivers = $b_0 + b_1 (+1SD \text{ of excellencism}) + b_2 (+1SD \text{ of perfectionism})$.

We also reported the standardized differences (Cohen's d and their 95% CI) between pairs of predicted values. For example, a positive standardized difference (e.g., $d = 0.30$) between the predicted value of perfection strivers and excellence strivers indicates that perfection strivers have higher impostor feelings than excellence strivers. Determining if this difference is statistically significant can be calculated in two ways using Mplus. First, a 95% CI of the standardized difference that does not contain zero (e.g., 95% CI of $d = [.22, .38]$) indicates a significant difference ($p < .05$) between the two predicted values. Second, dividing the value of d by its standard errors can be used to calculate an exact p -value using the delta method implemented in Mplus (Raykov & Marcoulides, 2004). These additional steps offer precision because they estimate an effect size and the significance of the differences between pairs of predicted values. As such, they complement the more traditional use and interpretation of the beta weights of a multiple regression.

In our second analysis, we performed a moderated multiple regression (Gaudreau, Schellenberg, et al., 2024) based on the equations of Cohen and colleagues (2002). Excellencism, perfectionism, and satisfaction with research productivity were entered as centred predictors. The excellencism $\times$ satisfaction and the perfectionism $\times$ satisfaction terms were also entered as predictors. After finding a significant interaction term (e.g., perfectionism $\times$ satisfaction), simple intercepts and simple slopes were estimated to calculate the association between the predictor and the dependent variable at low, medium, and high values of the moderator (i.e., satisfaction

with research productivity). The specific equations can be found in our Mplus available on OSF. Using the simple intercepts and slopes, we calculated the predicted values of the dependent variable for (a) nonexcellence/nonperfection strivers, (b) excellence strivers, and (c) perfection strivers at low, medium, and high values of the satisfaction with research productivity. We also reported the standardized differences (Cohen's d and their 95% CI) between pairs of predicted values, and significance testing on these differences was performed as described in the previous paragraph.

Results

Preliminary analyses

Descriptive statistics, internal consistency of the scores, and bivariate correlations are reported in Table 4. Consistent with the MEP, the mean score of excellencism was higher than that of perfectionism. Perfectionism and excellencism were positively and moderately correlated. Surprisingly, no significant association was found between impostor feelings and both perfectionism and excellencism. However, the perception of scientific productivity was moderately and positively correlated with both perfectionism and excellencism and negatively with impostor feelings.

Main Effects of Perfectionism and Excellencism on Impostor Feelings

Results of our multiple regression ($R^2 = .006$) showed that impostor feelings (intercept = 3.460) were not significantly predicted by excellencism ($b = -0.067$, $SE = 0.111$, $p = .549$, $\beta = -.034$) and perfectionism ($b = -0.065$, $SE = 0.071$, $p = .356$, $\beta = -.055$). As shown in Figure 2, the impostor feelings of excellence strivers ($d = -0.088$, 95% CI = $[-0.374, 0.199]$, $p = .549$) and perfection strivers ($d = -0.231$, 95% CI = $[-0.556, 0.093]$, $p = .162$) did not significantly differ compared to nonexcellence/nonperfection strivers. Furthermore, perfection strivers and

excellence strivers ($d = -0.144$, 95% CI = $[-0.449, 0.162]$, $p = .356$) did not significantly differ.

These findings did not support our first hypothesis.

Table 2.4

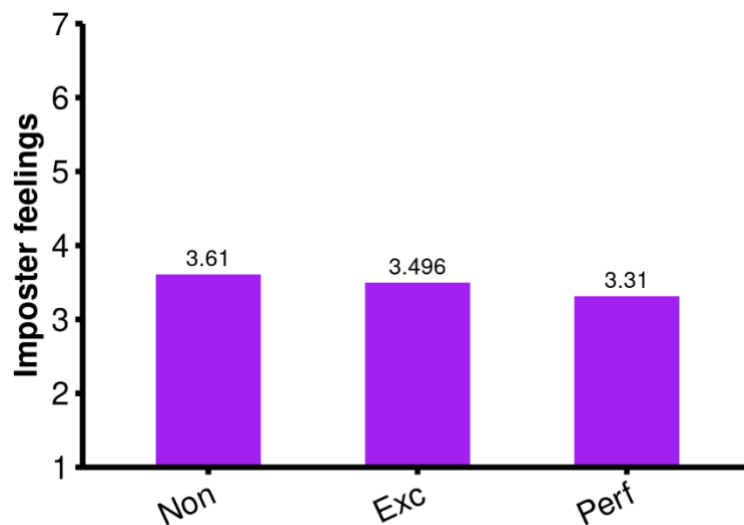
Study 2. Descriptive Statistics and Bivariate Correlations

Variables	<i>M</i>	<i>SD</i>	1	2	3	4
1. Perfectionism	4.03	1.431	(.96)			
2. Excellencism	5.52	0.854	.471**	(.92)		
3. Impostor feelings	3.46	1.687	-.071	-.060	(.90)	
4. Satisfaction with scientific productivity	4.04	1.186	.300**	.291**	-.250**	(NA)

Note. $N=372$. Omega's reliability coefficient in parentheses for each measure. ** $p < .01$. $p < .05$.

Figure 2.2

Study 2. Impostor Feelings of Perfection, Excellence, and Nonexcellence/Nonperfection Strivers



Note. Non= Nonexcellence/nonperfection strivers. Exc = Excellence strivers. Perf = Perfection strivers.

Moderation Analysis

As shown in Table 5, scientific productivity significantly moderated the association between perfectionism and impostor feelings. The excellencism $\times$ goal attainment interaction did not reach statistical significance, thus indicating that the associations between excellencism and impostor feelings did not significantly differ across the levels of satisfaction with research productivity. In our calculation of the predicted values, these associations were held constant across the three levels of satisfaction with research productivity. However, the perfectionism $\times$ satisfaction with research productivity interaction term significantly predicted impostor feelings. Simple slopes indicated that the association between perfectionism and impostor feelings was positive at low levels of satisfaction ($b = 0.165$) with research productivity, but negative at high levels ($b = -0.198$) of satisfaction with research productivity. The positive simple slopes of perfectionism (i.e., the difference between perfection and excellence strivers) turned statistically significant at $-1.12 SD$ (2.72 on the 7-point satisfaction scale). The negative simple slopes of perfectionism turned statistically significant at $+0.978 SD$ (5.20 on the 7-point satisfaction scale).

Based on these estimates, we calculated the predicted values of impostor feelings (see Figure 3). *For students with lower research productivity satisfaction*, perfection strivers experienced more impostor feelings compared to excellence strivers and nonexcellence/nonperfection strivers. *For students with higher research productivity satisfaction*, perfection strivers experienced fewer impostor feelings compared to excellence strivers and nonexcellence/nonperfection strivers. Excellence strivers and nonexcellence/nonperfection strivers did not significantly differ across any of the three levels of satisfaction with research productivity.

Table 2.5*Study 2. Relationships of Excellencism and Perfectionism with Impostor Feelings**Moderated by the Satisfaction of Scientific Productivity*

	<u>Impostor feelings</u>		
	B	S.E.	β
Intercept	3.529		
Excellencism (E)	0.055	0.116	0.028
Perfectionism (P)	-0.016	0.072	-0.014
Satisfaction with scientific productivity (SP)	-0.375**	0.077	-0.264**
E $\times$ SP	-0.031	0.102	0.019
P $\times$ SP	-0.153**	0.055	-0.168**

Simple slopes

@ Low Satisfaction with scientific productivity

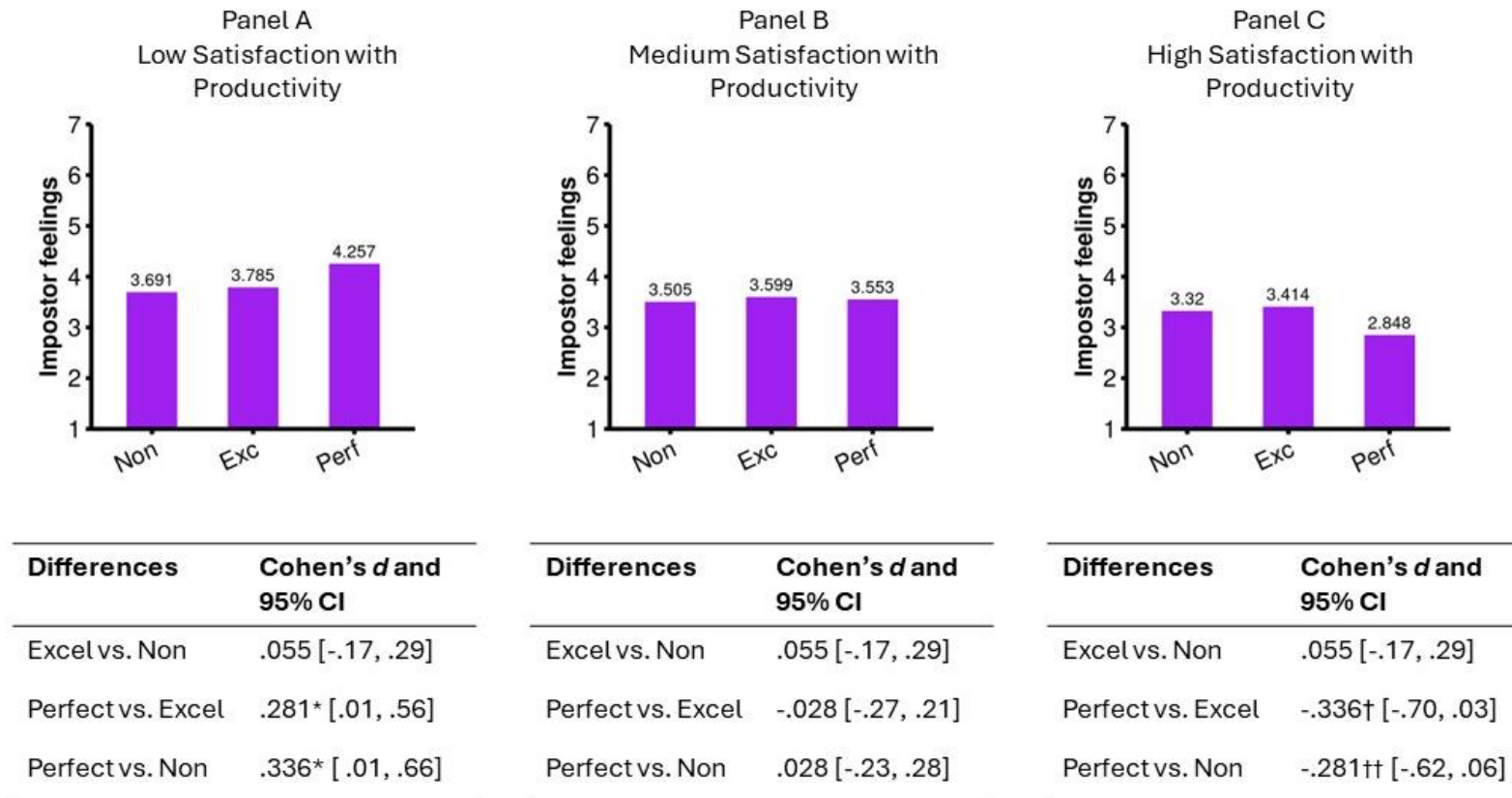
Intercept	3.974		
Excellencism	0.055	0.115	
Perfectionism	0.165*	0.084	

@ High Satisfaction with scientific productivity

Intercept	3.084		
Excellencism	0.055	0.116	
Perfectionism	-0.198*	0.100	

Note. N=372. B= unstandardized estimate, β = standardized estimate. Standardized

estimates are not available for simple slopes. ** $p < .01$ * $p < .05$.

Figure 2.3*Study 2. Moderating Role of Satisfaction with Research Productivity*

Note. Non = nonexcellence/nonperfection strivers. Excel = Excellence strivers. Perfect = Perfection strivers. ** $p < .01$. * $p < .05$. † $p = .071$. †† $p = .107$.

Based on these estimates, we calculated the predicted values of impostor feelings (see Figure 2). *For students with lower research productivity satisfaction*, perfection strivers experienced more impostor feelings compared to excellence strivers and nonexcellence/nonperfection strivers. *For students with higher research productivity satisfaction*, perfection strivers experienced fewer impostor feelings compared to excellence strivers and nonexcellence/nonperfection strivers. Excellence strivers and nonexcellence/nonperfection strivers did not significantly differ across any of the three levels of satisfaction with research productivity.

Brief Discussion

The results of Study 2 differed from the meta-analytical findings reported in Study 1. In both the bivariate correlations and the multiple regression, we did not find significant associations of both excellencism and perfectionism with the experience of impostor feelings. However, our results supported the idea that the outcomes of perfection strivers are contingent on their achievement (e.g., Egan et al., 2016; Hewitt et al., 2017). More precisely, the association between perfectionism and impostor feelings was moderated by satisfaction with scientific productivity. This effect followed the pattern of a crossover interaction with a positive association at the lower-end and a negative association at the upper end of the continuum of satisfaction with scientific productivity. For students unsatisfied with their research productivity, perfection strivers reported higher experience of impostor feelings than excellence strivers. For students more satisfied with their research productivity, perfection strivers reported lower impostor feelings than excellence strivers. Conversely, the association between excellencism and impostor feelings was not significantly moderated by satisfaction with scientific productivity. Regardless of their satisfaction, excellence strivers did not experience more impostor feelings

compared to nonexcellence/nonperfection strivers. Overall, this crossover interaction effect supported the idea that perfection strivers rely on achievement to construe their self-worth.

Study 3

Our goal in Study 3 was threefold. First, we aimed to replicate the results of Study 2 in a new sample of graduate students. This replication was desirable because our findings did not replicate the meta-analytical estimates from Study 1. Most of the studies included in our meta-analysis have been conducted with undergraduate students. The studies conducted with graduate students did find a significant and positive correlation between perfectionistic standards and impostor feelings (Berry et al., 2021; Cowie et al., 2018). Our results in Study 2 did not find such a significant association. Therefore, evaluating the robustness of the effects we observed in Study 2 was important.

Second, we wanted to complement our analyses with different indicators of research productivity. Rather than solely focusing on satisfaction, we asked a series of questions (e.g., publications, presentations at conferences) that were deemed useful to evaluate the research output of graduate students (Kuncel et al., 2001). In a bibliometric study of 933 students who graduated between 2004 and 2009, students were found to publish 0.86 articles on average every year (Pezzoni et al., 2016). Similar numbers have been reported across distinct fields of study (Hatch & Skipper, 2016). Writing for research requires strong writing and reading skills. Writing and reading self-efficacy both play a significant role in the experiences of engagement, life satisfaction, academic burnout, and impostor feelings of graduate students (Jonas & Hall, 2022). Writing for publication is a challenging but largely valued skill during graduate school (e.g., scholarships, funding to travel to conferences) and for the academic job market (e.g., postdoctoral fellowships, faculty positions). With so much on the line, everyone feels like they

must publish at least once in their graduate career to make a significant contribution to their field of study (Hoover & Lucas, 2023). Therefore, in Study 3, we examined whether the impostor feelings of perfection strivers were contingent on their level of research productivity.

Finally, publishing in scholarly journals requires some tolerance for uncertainty and negative feedback. After working countless hours on a research project, graduate students must face the daunting task of reading and digesting the feedback from experts in their field of study. Success and failure are the most potent sources of self-efficacy and their effects are stronger for less experienced people (Bandura, 1997). Graduate students are still novel participants in the peer-review system, and a rejection letter with a clear-cut decision will likely make graduate students feel like impostors regardless of whether they are perfection strivers or excellence strivers. Conversely, many decision letters are ambiguous and leave mixed feelings about the strengths and flaws of a manuscript. Ambiguity and uncertainty are tougher to tolerate for perfection than excellence strivers (Cheek & Goebel, 2020). When invited to resubmit their work in a decision letter, researchers must read between the lines and understand that their work is getting closer to the finish line. Such an outcome indicates significant goal progress and a strong potential for eventual objectifiable success. Excellence strivers (compared to perfection strivers) are more likely to reap the benefits of this intermediate step toward success. They are more capable of savouring both goal progress and goal attainment when something positive happens to them at school (Gaudreau, Schellenberg, et al., 2024). Based on these arguments, we wanted to explore what happens to the impostor feelings of graduate students when they receive failure feedback (i.e., rejection of a manuscript), mixed feedback (i.e., a revise to resubmit decision), and infrequent and largely unrealistic glowing feedback (i.e., only positive feedback in a decision letter).

Method

Participants and Procedure

A total of 402 graduate students were recruited through Prolific Academic as part of a broader research program examining the psychological experience of graduate students. Students who participated in Study 2 were unable to participate in this study because they were blocked using an exclusion criterion on Prolific. Following the application of eligibility criteria and the removal of those who failed attention checks, 14 participants were excluded, resulting in a final sample of 388 graduate students. Participants ranged in age from 20 to 65 years ($M = 30.57$, $SD = 9.23$). Within this sample, 61.3% identifying as females, 36.3% as males, and 2.3% as another gender identity. Graduate students were enrolled in diverse universities across 11 geographical regions. The majority were enrolled in universities in the United Kingdom (57.9%), the United States (29%), Canada (5.2%), Australia (6.5%), and other countries (2.3%). In terms of ethnic background, 67.2% identified as White, 7.5% as East Asian, 5.4% as Black, 5.4% as South Asian, 4.7% as Latino, 4.1% as multicultural, 2.3% as Middle Eastern, and 3.2% reported another cultural background. Most participants were enrolled in a master's program (64.4%), whereas 33.9% were pursuing doctoral studies and 1.5% were enrolled in a combined master-doctoral program. The majority were registered as full-time students (65.2%), with 34% in part-time studies, and a small proportion was awaiting graduation (0.8%). With respect to the program progression, 33.8% were in their first year and 35.1% in their second year, while 12.4% were in their third year, 9% in their fourth year, and 7.8% were in their fifth year or beyond.

Design and Measures

Survey. Excellencism, perfectionism, and satisfaction with research productivity were measured as per Study 2. We used the 7-item version of the Leary Impostor Scale (LIS; Leary et

al., 2000) to measure impostor feelings. Internal consistency coefficients are reported in Table 6. Results of a confirmatory factor analysis (with the WLSMV estimator) showed that most fit indices were in favour of the proposed unidimensional structure of the LIS ($\chi^2 = 132.06$, $df = 14$, $p < .001$, CFI = .996, TLI = .993, RMSEA = .147, SRMR = .012) with standardized factor loadings ranging from .83 to .96.

Furthermore, we used four questions to measure the research productivity of graduate students: (a) the number of published articles as a lead author, (b) the number of published articles as a co-author, (c) the number of presentations in scientific conferences, and (d) the number of articles submitted for publication during the past year. The first three questions were added and divided by the number of years in the program to account for the fact that senior students are more likely to have a deeper track record of publications. We added the fourth question to this score to obtain a composite score representing the overall annual research output of graduate students. The internal consistency of this composite score was acceptable ($\omega = .75$).

Scenarios. Participants read the following instructions: “In this section, a series of scenarios will be presented to you. Please carefully read each scenario and then indicate how you would react in each context presented to you”. All participants read each scenario in the same order. The storyline of the three scenarios was held constant and reads like this: “After working for several months on a research project, you decided to submit the results for publication in a scientific peer-reviewed journal. This journal is a good fit for both the quality and subject of your research. This journal has previously published similar studies”. Only the performance outcome varied across the scenarios. In the *negative feedback scenario*, participants were told, “You received significantly more negative feedback compared to positive feedback from the editor and the reviewers. Based on their feedback, you evaluate that your chances of being published in this

journal are very low”. This scenario was meant to depict the typical feedback received in a rejection letter. In the *mixed feedback scenario*, participants were told, “You received the same amount of positive and negative feedback from the editor and the reviewers. Based on their feedback, you evaluate that your chances of being published in this journal are average”. This scenario was meant to depict the type of feedback received in a rejection letter with an option to revise and resubmit. Finally, in the *positive feedback scenario*, participants read the following: “You only received positive feedback from the editor and the reviewers. Based on their feedback, you evaluate that your chances of being published in this journal are very good”. This scenario was meant to depict the type of feedback received in a minor revision decision.

After reading each scenario, participants were asked to evaluate the extent to which each item corresponded to how they would react in the scenario. We measured the experience of impostor feelings with four items used in Study 2. All items were assessed on a scale from 1 (*not at all agree*) to 7 (*totally agree*). Internal consistency of the score was acceptable in the negative ($\omega = .92$), mixed ($\omega = .93$), and positive ($\omega = .94$) feedback scenarios.

Plan of Analyses

The plan of analysis for the survey data was identical to Study 2. The hypothetical scenarios of feedback required a multilevel model because participants evaluate the impostor feelings for each of the three scenarios (i.e., repeated measures; within-person design). We created a model with two contrasts (i.e., fixed effects) that varied across individuals (i.e., random effects). The first contrast compared to the first two scenarios to assess the within-person difference in impostor feelings from a scenario of negative feedback to a scenario of mixed feedback during the peer review process. The second contrast compared to the last two scenarios to assess within-person difference in impostor feelings from a scenario of mixed feedback to a

scenario of positive feedback during the peer review process. Excellencism and perfectionism (centred around the mean of the sample) were predictors of the contrasts (i.e., difference across scenarios) and intercepts (i.e., between-person differences in a specific scenario). This type of model (i.e., slopes as outcomes or cross-level interactions) was estimated to determine whether the *within-person differences in impostor feelings* are associated with excellencism and perfectionism, and therefore significantly differed across nonexcellence/nonperfection strivers, excellence strivers, and perfection strivers. Furthermore, using the intercept as an outcome estimated whether the *between-person differences of impostor feelings* in a specific feedback scenario are associated with excellencism and perfectionism, and therefore significantly differed across nonexcellence/nonperfection, excellence, and perfection strivers.

We coded the contrast variables in a way that allowed us to test three iterations of the same model to predict the between-person differences of impostor feelings in each of the hypothetical scenarios. In our first iteration, we coded the contrast variables (contrast 1 = 0, 1, 1; contrast 2 = 0, 0, 1) so that the intercept corresponded to impostor feelings in the first scenario. Using this coding, the intercept corresponds to the scenario coded as 0 in the two contrast variables. In our second and third iterations, the contrast variables were coded so that the intercept corresponded to impostor feelings during the second scenario (contrast 1 = -1, 0, 0; contrast 2 = 0, 0, 1) or the third scenario (contrast 1 = -1, 0, 0; contrast 2 = -1, -1, 0), respectively. As explained by Muthén and Muthén (2000, p. 294), “models with different centring points are reparameterizations of each other and result in the same model”, with the only exception that the intercept of each model reflects the between-person differences of impostor feelings in a different feedback scenario. Predicted values were calculated, compared, and

graphed using the same approach as in the multiple regressions (see our Mplus codes and outputs publicly available).

Results

Preliminary Analyses

Descriptive statistics, internal consistency of the scores, and bivariate correlations are reported in Table 6. Consistent with the MEP, the mean score of excellencism was higher than the mean score of perfectionism. Perfectionism and excellencism were positively and moderately correlated. Consistent with Study 2, no significant association was found between impostor feelings and both perfectionism and excellencism.

Main Effects of Perfectionism and Excellencism on Impostor Feelings

Results of our multiple regression ($R^2 = .003$) showed that impostor feelings (intercept = 3.754) were not significantly predicted by excellencism ($b = -0.123$, $SE = 0.116$, $p = .289$, $\beta = -.063$) and perfectionism ($b = 0.029$, $SE = 0.064$, $p = .646$, $\beta = .026$). Like the results shown in Figure 2, the impostor feelings of excellence strivers ($d = -0.125$, 95% CI = [-0.356, 0.105], $p = .287$) and perfection strivers ($d = -0.074$, 95% CI = [-0.324, 0.177], $p = .565$) did not significantly differ compared to nonexcellence/nonperfection strivers. Furthermore, perfection strivers and excellence strivers ($d = 0.052$, 95% CI = [-0.169, 0.273], $p = .646$) did not significantly differ. These findings did not support our first hypothesis but replicated the findings from Study 2.

Table 2.6*Study 3. Descriptive Statistics and Bivariate Correlations*

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Perfectionism	3.53	1.548	(.97)				
2. Excellencism	5.45	0.899	.469**	(.94)			
3. Impostor feelings	3.75	1.760	-.003	-.050	(.97)		
4. Satisfaction with scientific productivity	4.14	1.179	.204**	.290**	-.367**	(NA)	
5. Annual scientific productivity	1.67	2.110	.183**	.041	-.113*	.252**	(.75)

Note. $N = 388$. Omega's reliability coefficient is presented in parentheses for each measure. ** $p < .01$. * $p < .05$.

Moderation Analysis

As shown in Model 1 in Table 7, satisfaction with scientific productivity did not significantly moderate the association between perfectionism and impostor feelings ($p = .132$). However, the annual scientific productivity significantly moderated the association between perfectionism and impostor feelings (see Model 2 in Table 7). The excellencism $\times$ annual scientific productivity interaction did not reach statistical significance, thus indicating that the associations between excellencism and impostor feelings did not significantly differ across levels of research productivity. In our calculation of the predicted values, these associations were held constant across the three levels of annual research productivity. Simple slopes indicated that the association between perfectionism and impostor feelings was positive and significant at low levels of annual research productivity but negative and non-significant at high levels of research productivity.

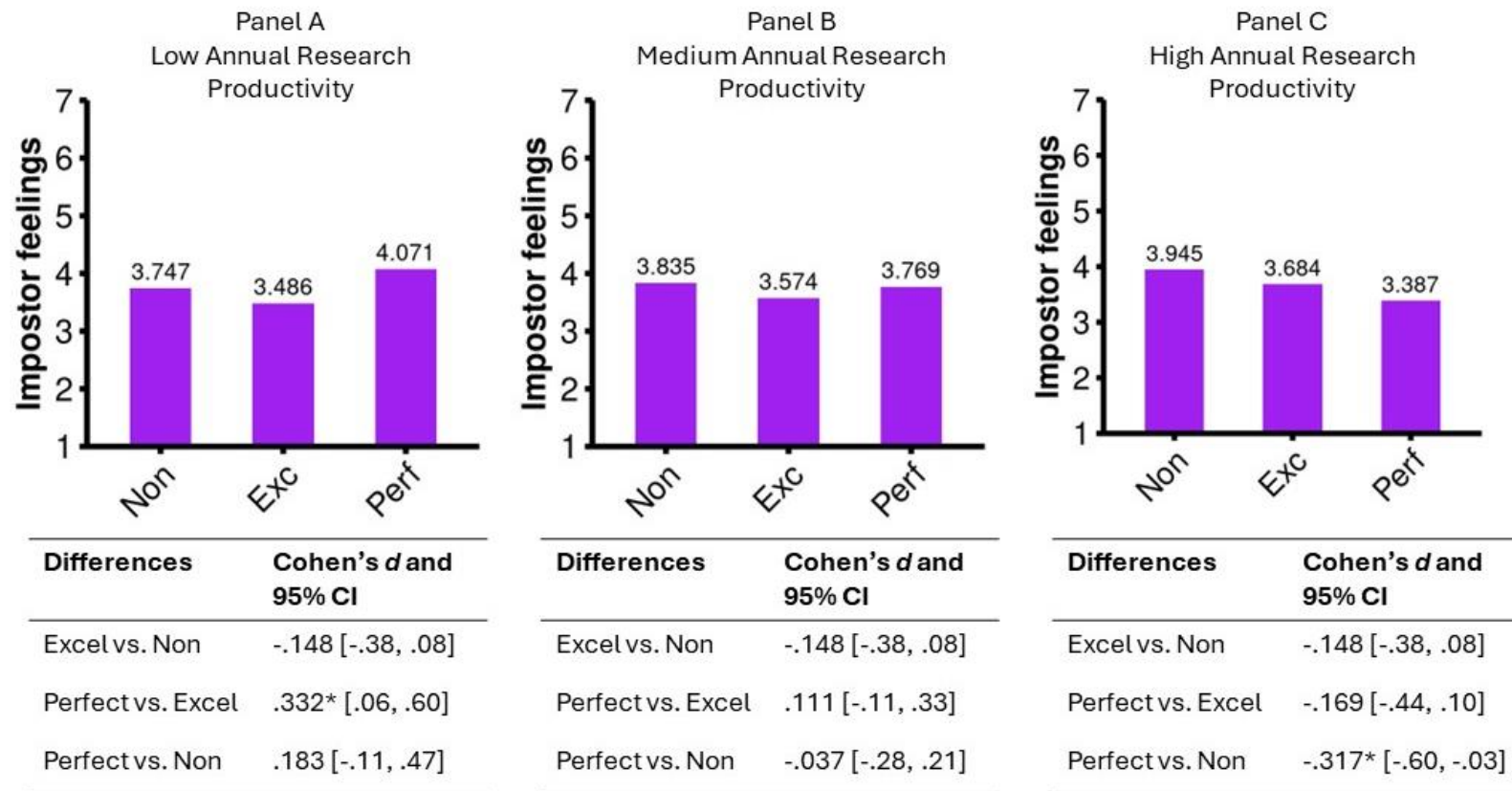
Based on these estimates, we calculated the predicted values of impostor feelings (see Figure 4). *For students with lower annual research productivity*, perfection strivers experienced more impostor feelings compared to excellence strivers and nonexcellence/nonperfection strivers. *For students with higher annual research productivity*, perfection strivers experienced comparable impostor feelings to excellence strivers but significantly lower than nonexcellence/nonperfection strivers. Excellence and nonexcellence/nonperfection strivers did not significantly differ across any of the three levels of annual research productivity.

Table 2.7*Study 3. Relationships of Excellencism and Perfectionism with Impostor Feelings**Moderated by the Satisfaction with Scientific Productivity (Model 1) and Annual**Scientific Productivity (Model 2)*

	<u>Model 1</u>			<u>Model 2</u>		
	B	S.E.	β	B	S.E.	β
Intercept	3.808			3.802		
Excellencism (E)	0.062	0.106	0.032	-0.145	0.115	-.074
Perfectionism (P)	0.086	0.061	0.076	0.063	0.064	.055
Moderator (MOD)	-0.575**	0.070	-0.385**	-0.064	0.042	-.077
E $\times$ MOD	-0.087	0.085	-0.057	-0.033	0.046	-.036
P $\times$ MOD	-0.072	0.048	-0.080	-0.075**	0.024	-.150**
Simple slopes						
@ Low Moderator						
Intercept	4.486			3.909		
Excellencism	0.062	0.106		-0.145	0.115	
Perfectionism	0.172†	0.092		0.189*	0.078	
@ High Moderator						
Intercept	3.130			3.666		
Excellencism	0.062	0.106		-0.145	0.115	
Perfectionism	0.001	0.073		-0.096	0.078	

Note. N=388. B= unstandardized estimate, β = standardized estimate. ** $p < .01$ * $p < .05$.

† $p = .063$. No standardized estimate is available for simple slopes.

Figure 2.4*Study 3. Moderating Role of Annual Research Productivity*

Note. Non = nonexcellence/nonperfection strivers. Excel = Excellence strivers. Perfect = Perfection strivers. ** $p < .01$. * $p < .05$.

Multilevel Modelling of Impostor Feelings Across Three Performance Scenarios

The results are shown in Table 8. Impostor feelings significantly decreased from the scenarios of negative to mixed feedback (i.e., contrast 1; $b = -0.939$) and across scenarios of mixed to positive feedback (i.e., contrast 2; $b = -0.895$). The predicted values of impostor feelings are presented in panel A of Figure 5. Only the first contrast was significantly predicted by excellencism and perfectionism. Therefore, the *within-person differences* in impostor feelings from the scenarios of negative to mixed feedback differed across nonexcellence/nonperfection strivers ($b = -0.925$, S.E. = 0.083, $p < .001$), excellence strivers ($b = -1.253$, S.E. = 0.125, $p < .001$), and perfection strivers ($b = -0.953$, S.E. = 0.105, $p < .001$). The decline in impostor feelings for nonexcellence/nonperfection strivers was significantly smaller than for excellence strivers (raw difference = -0.328 , $p < .05$). The decline in impostor feelings for excellence strivers was significantly stronger than for perfection strivers (raw difference = 0.300 , $p < .05$).

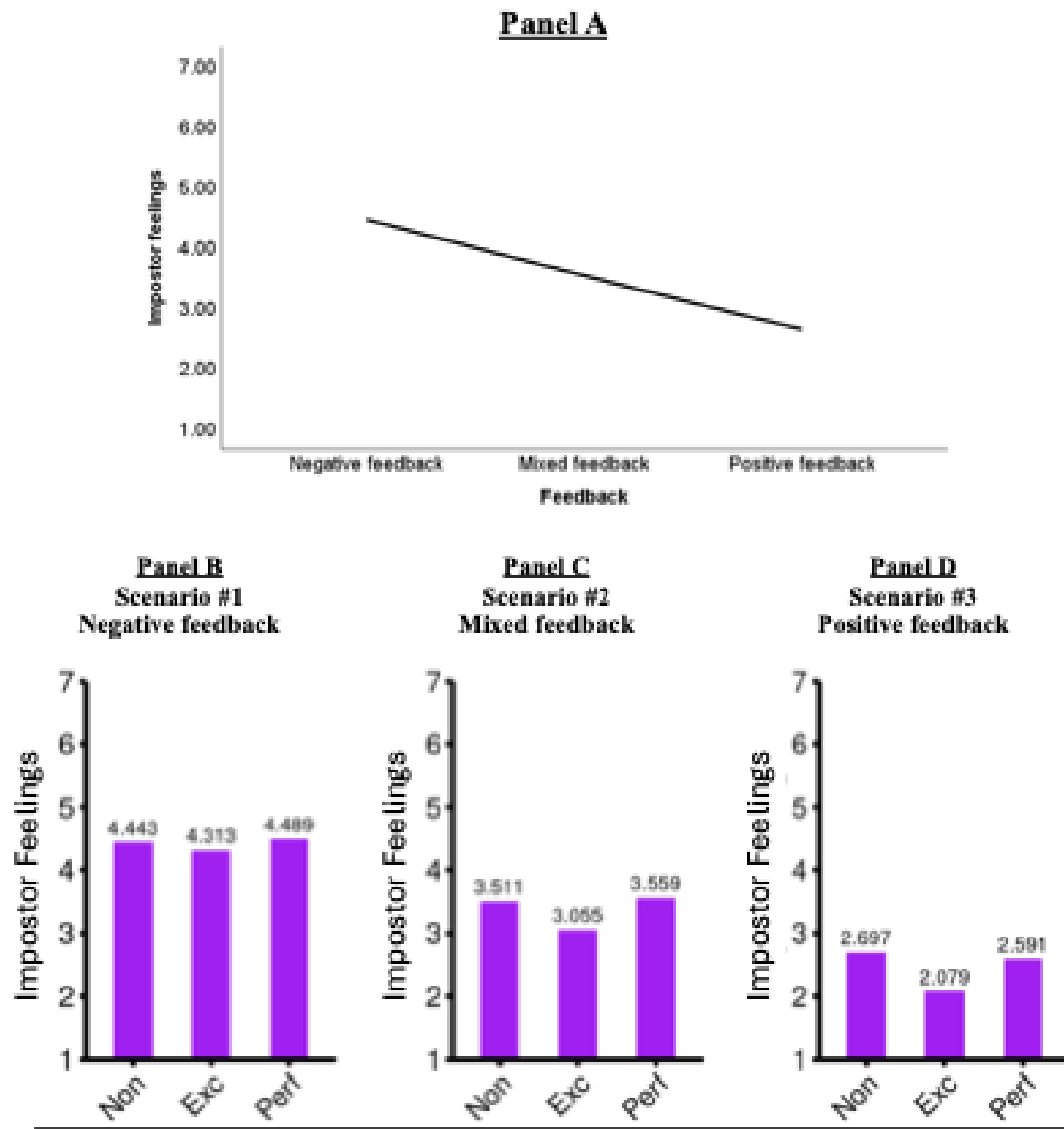
Three iterations of the same model were used to predict the *between-person differences* in impostor feelings in each of the hypothetical feedback scenarios. Figure 5 shows the between-person differences in impostor feelings across excellence, perfection, and nonexcellence/nonperfection strivers in the negative (panel B), mixed (panel C), and positive (panel D) feedback scenarios. In the scenario of negative feedback, excellencism and perfectionism were not significantly associated with impostor feelings. In both the mixed and positive feedback scenarios, excellencism was negatively associated with impostor feelings. In contrast, perfectionism was positively associated with impostor feelings. Therefore, these results indicate that impostor feelings in the mixed and positive feedback scenarios were significantly lower in excellence strivers than both nonexcellence/nonperfection and perfection strivers.

Table 2.8

Study 3. Multilevel Model of Impostor Feelings Across Negative, Mixed, and Positive Feedback Scenarios

Parameters	<i>B</i>	<i>S.E.</i>	<i>p</i>
Slope 1 (scenario 2 vs 1) Var = 0.026	-0.939	0.059	<.001
Slope 1 as an outcome			
Excellencism	-0.183	0.071	.010
Perfectionism	0.097	0.045	.030
Slope 2 (scenario 3 vs 2) Var = 0.600	-0.895	0.067	<.001
Slope 2 as an outcome			
Excellencism	-0.077	0.082	.347
Perfectionism	-0.003	0.051	.955
Intercept in scenario 1 Var = 0.757	4.466	0.095	<.001
Intercept as an outcome in scenario 1			
Excellencism	-0.072	0.132	.585
Perfectionism	0.054	0.072	.451
Intercept in scenario 2 Var = 0.278	3.535	0.081	<.001
Intercept as an outcome in scenario 2			
Excellencism	-0.253	0.109	.020
Perfectionism	0.155	0.061	.011
Intercept in scenario 3 Var = 0.345	2.644	0.079	<.001
Intercept as an outcome in scenario 3			
Excellencism	-0.343	0.109	.001
Perfectionism	0.158	0.059	.007
Cohen's <i>d</i> and 95% CI			
	<u>Excel vs. Non</u>	<u>Perfect vs. Excel</u>	<u>Perfect vs. Non</u>
Intercept in scenario 1	-0.092 [-0.42, 0.24]	0.119 [-0.19, 0.43]	0.027 [-0.31, 0.36]
Intercept in scenario 2	-0.312* [-0.58, -0.04]	0.331* [0.07, 0.59]	0.019 [-0.25, 0.29]
Intercept in scenario 3	-0.452** [-0.74, -0.17]	0.359* [0.09, 0.63]	-0.093 [-0.38, 0.19]
Delta method raw difference			
	<u>Excel vs. Non</u>	<u>Perfect vs. Excel</u>	<u>Perfect vs. Non</u>
Slope 1	-0.328* [-0.58, -0.08]	0.300* [0.03, 0.57]	-0.029 [-0.32, 0.26]
Slope 2	-0.139 [-0.42, 0.15]	-0.009 [-0.32, 0.30]	-0.148 [-0.49, -0.19]

Note. *N* = 388. Scenarios 1, 2, and 3 are negative, mixed, and positive feedback. Var = Variance. Excel = Excellence strivers. Perfect = Perfection strivers. Non = Nonexcellence/nonperfection strivers. ***p* < .01. **p* < .05.

Figure 2.5*Study 3. Impostor Feelings Across Three Hypothetical Feedback Scenarios*

Note. Non = nonexcellence/nonperfection strivers. Exc = Excellence strivers. Perf = Perfection strivers.

The impostor feelings of nonexcellence/nonperfection and perfection strivers in these two scenarios did not differ. Most of the evidence indicated that perfectionism was harmful, whereas excellencism was adaptive.

Brief Discussion

Results of Study 3 replicated Study 2 with excellencism and perfectionism showing no main effects on impostor feelings. They also replicated Study 2 in showing that a self-reported index of research productivity moderated the association between perfectionism and impostor feelings. For the students with high levels of productivity, perfection strivers did not experience significantly different impostor feelings than excellence strivers. However, the difference became significant for students with lower levels of research productivity.

Our results also complemented those of Study 2 by showing that perfection and excellence strivers differentially react to hypothetical feedback received during the scientific peer-review process. Perfectionism and excellencism were not significantly associated with impostor feelings in the negative feedback scenario. In both the mixed and positive feedback scenarios, impostor feelings were negatively related to excellencism and positively related to perfectionism. Overall, the associations of perfectionistic standards and impostor feelings require nuanced interpretations.

General Discussion

Over the years, many researchers have assumed that perfectionism and the experience of impostor feelings are inherently related (e.g., de Vries, 2005; Leonard & Harvey, 2008). However, the existing literature has often failed to find the expected positive association between perfectionistic standards and impostor feelings. The results of our meta-analysis, followed by

two novel studies with graduate students, have shown that this relationship is more complex than it appears.

Central Findings

Guided by recent theoretical developments (e.g., Gaudreau, 2019), our meta-analysis distinguished and examined the unique contribution of excellencism and perfectionism. We reinterpreted the results from past studies after separating those that relied on proxy measures of perfectionistic standards (e.g., self-oriented perfectionism) and proxy measures of excellencism (e.g., personal standards). On the one hand, the proxy measures of excellencism – those measuring the aiming and striving toward high standards – were unrelated to impostor feelings. On the other hand, proxy measures of perfectionistic standards – those in which most items looked at the aiming and striving toward perfection – were positively related to impostor feelings. These results indicate that previous studies have misjudged the effects of perfectionism by conflating them with those of excellencism. As a result, the literature has painted a diluted portrait of the deleterious effect of perfectionism on impostor feelings. A recent meta-analysis reported similar findings in which proxy measures of high standards and perfectionistic standards were differentially associated with unhelpful outcomes (e.g., anxiety, procrastination, burnout) in the academic domain (Osenk et al., 2020). Proxy measures of excellencism and perfectionistic standards are distinctively related to impostor feelings, and future research should align with the premises of the MEP (Gaudreau, 2019) and stop using questionnaires in which they are both treated as the same construct.

Most studies included in our meta-analysis relied on measures that conflated perfectionistic and high standards (i.e., excellencism). Most of the studies were conducted with samples of undergraduate students. The results of a recent study, based on the MEP, reported that

impostor feelings were negatively associated with excellencism and positively associated with perfectionism (Gaudreau et al., 2022). Our goal was to investigate whether these results would generalize to students enrolled in graduate studies. Contrary to expectations, our results across two studies showed that neither excellencism nor perfectionism showed a significant main effect on impostor feelings of graduate students. Once reinterpreted using the guidelines of the MEP (Gaudreau, Schellenberg, et al., 2024), these findings indicate that nonexcellence/nonperfection, excellence, and perfection strivers have experienced a similar number of impostor feelings since the start of their graduate studies.

Another consistent finding emerged across our two studies: The association between perfectionism and impostor feelings was impacted by the research productivity of graduate students, which acted as a moderator. More precisely, perfectionism was positively associated with impostor feelings for students who were less satisfied with their research productivity (Study 2) and students who reported lower annual research productivity (Study 3). Not all perfectionists experienced more impostor feelings compared to excellence strivers. The difference was larger and statistically significant for the graduate students who reported lower levels of research productivity. This finding echoes the results of a recent study that showed that perfection strivers enjoy and savour their activities less than excellence strivers when they struggle to attain their goals (Gaudreau, Schellenberg, et al., 2024). This is consistent with the long-held position that the sense of self-worth and wellness of perfectionists depend too much on achievement (e.g., Egan et al., 2016; Hewitt et al., 2017). Perfectionism is unhealthy because it makes graduate students feel like impostors when they fail to attain average and above-average research productivity.

Further Considerations

Our results across two samples of graduate students did not replicate those of Gaudreau and colleagues (2022) with undergraduate students. Graduate students are accomplished students who have accumulated episodes of academic success over many years. This could explain why many perfectionistic graduate students (even the ones with an average level of research productivity) are not experiencing higher impostor feelings than excellence strivers. Compared to undergraduate students, they may have experienced enough academic success to feel secure and worthy in their role as students and their capacity to succeed in their academic endeavours. It was only when they felt unsatisfied with their research productivity (Study 2) or reached a below-average threshold of research productivity (Study 3) that perfectionism made graduate students more likely to feel like impostors. Our research indicates that undergraduate and graduate students differ in how their perfectionism relates to impostor feelings.

The moderating role of research productivity is consistent with a stress-diathesis framework in which the debilitating effects of perfectionism are assumed to be activated when perfectionists experience stressors that threaten their sense of self (e.g., Flett et al., 1995; Levine et al., 2020). Research activities are often used as benchmarks to evaluate progress and achievement in graduate school, and they can also contribute to one's financial security through scholarships and assistantships. Research productivity is positively associated with job satisfaction (Albert et al., 2018) and self-efficacy (Livinți et al., 2021) and may even facilitate one's feelings of social belonging in the academic domain (Stachl & Baranger, 2020). Perfection strivers have very high standards, and they evaluate themselves based on these standards. They also experience many perfectionistic concerns, such as being concerned about mistakes, doubting their actions, and feeling like what they do is never good enough (e.g., Gaudreau, 2021; Tape et al., 2024). In that context, it is theoretically plausible that below-average research productivity

acts as a stressor that exacerbates the vulnerability and activates the impostor feelings of perfectionists. Our results, across two samples, provided empirical support for this position.

Satisfaction and annual research productivity were only moderately correlated (see Table 5). Furthermore, their associations with impostor feelings differed. On the one hand, satisfaction with research productivity was robustly associated with impostor feelings in both Study 2 ($r = -.25$) and Study 3 ($r = -.37$). On the other hand, annual research productivity was weakly associated with impostor feelings ($r = -.11$). People have different personal goals. Satisfaction with research productivity is an idiosyncratic measure that considers each student's perception of their achievement. Such subjective measures, like measures of satisfaction and goal progress, are typically more strongly associated with the emotional and psychological experiences of students (e.g., Klug & Maier, 2015; Locke & Latham, 2013). Overall, these findings outline the need to consider not only the total amount of research outputs produced by graduate students, but also their personal evaluations, perceived progress, and satisfaction with their own academic achievement.

Finally, impostor feelings were found to vary according to the type of feedback obtained during a hypothetical peer review process of a scientific article. On average, graduate students reported increasingly higher impostor feelings across scenarios in which they were exposed to positive, mixed, and negative feedback. Nonexcellence/nonperfection, excellence, and perfection equally felt like impostors in the negative feedback scenario. Unambiguously negative feedback had a comparable effect on everyone. In contrast, when exposed to mixed and positive feedback scenarios, excellence strivers experienced lesser impostor feelings than nonexcellence/nonperfection and perfection strivers. Excellence strivers were also the ones to experience the sharpest decline in impostor feelings from the negative to the mixed feedback

scenario. A mixed feedback scenario is a typical positive outcome of the peer review process (Carless et al., 2024). Receiving positive feedback alongside negative feedback is a sign that editors are inviting you to revise and resubmit, which could eventually lead to the acceptance and publication of a scientific article. In that context, it appears like excellence strivers were more receptive to the underlying message of the mixed feedback as they experienced the strongest within-person decrease in impostor feelings. Such results, which are like the recent findings looking at state anxiety across bad, average, and good performance scenarios (Gaudreau, Boivin, et al., 2024), indicate that excellence strivers are better equipped to reap the psychological effects of a good enough performance.

Limitations and Future Research

Like all studies included in our meta-analysis, our two original studies relied on a cross-sectional design. Whether perfectionistic standards influence impostor feelings (or vice versa) is a question that remains open to empirical investigation. However, past studies on the MEP showed that perfectionistic standards (once separated from excellencism) are very stable over time (Gaudreau et al., 2022). Perfectionism is a personality disposition, and we assumed no grounding for the idea that impostor feelings could influence the perfectionistic standards of graduate students. Reverse directionality seems improbable but should nonetheless be ruled out in future research.

Our two studies relied on a single operationalization of impostor feelings. This is not a limitation per se because we selected a measure that directly tapped into the central features of impostor feelings (Leary et al., 2000). Impostor feelings have mostly been operationalized as unidimensional (e.g., Ereksen et al., 2024), but some recent questionnaires have been created to separate different characteristics of the construct (Ibrahim et al., 2022; Walker & Saklofske,

2023). As such, future research should explore how perfectionism and excellencism are associated with characteristics that were not included in our studies.

The MEP proposes that perfectionistic standards are the core definitional feature of perfectionism (Gaudreau, 2021). Hence, our studies focused on perfectionistic standards and did not measure perfectionistic concerns. However, the results of our meta-analysis showed stronger associations between perfectionistic concerns and impostor feelings. Based on the premises of the MEP, future research should examine whether perfectionistic concerns mediate the association between perfectionistic standards and impostor feelings. Such findings would be consistent with the MEP (Gaudreau, 2019), the more proximal (stronger) effect of perfectionistic concerns on symptoms of psychological distress (e.g., Limburg et al., 2017; Smith et al., 2021), and the idea that concerns and doubts generally accompany the aiming and striving toward perfection (e.g., Gaudreau, 2021; Sirois & Molnar, 2016; Stoeber, 2018).

We recruited two samples of graduate students from different countries, disciplines, and levels of education (e.g., M.A., Ph.D., others). On the one hand, this broader sampling strategy is a strength because it maximizes the generalizability and external validity of our findings. On the other hand, it is also a limitation because it prevents us from closely examining differences across subgroups of the graduate student population. Our sample size was appropriate for our plan of analysis, which consisted of examining the interplay of perfectionism, research productivity, and impostor feelings across the entire group of graduate students. Future research with a much larger sample size will be needed to determine if our results replicate across all subgroups within the graduate student population. Based on the mean-level differences previously observed in impostor feelings across genders (e.g., Price et al., 2024), future research should examine if research productivity differentially affects the association between

perfectionism and feelings of impostor across gender groups, and other subgroups based on ethnicity and different disciplines/programs with varying degrees of emphasis on research activities (e.g., Bernard, 2024).

A limitation of Study 2 lied in the wording of the single item used to assess perceived scientific productivity of graduate students (e.g., Considering the year into your program (and comparing yourself to other students in your field), how would you rate your level of scientific productivity?). Although our intent was to encourage the participants to consider their disciplinary context, program, and level of experience rather than to engage in direct social comparison, the nature of the question may have prompted some graduate students to evaluate their scientific productivity relative to their peers. This is particularly relevant given that individuals with perfectionistic tendencies are prone to engage in detrimental socio-behavioural (Hewitt et al., 2003), which could bias their self-assessment. This is further compounded by graduate students often lacking accurate information regarding their peers' productivity and the internalized pressure they may experience (Devos et al., 2017; Jaremka et al., 2020). To address this issue, in Study 3 we included more objective indicators of research productivity, grounding assessment in concrete academic outputs rather than relative perceptions, thereby reducing the risk of bias from social comparison present in Study 2. Future research should refine and validate productivity measure that minimize the influence of social comparison while capturing the diverse contribution of graduate students.

Finally, in Study 3, we explored impostor feelings across three hypothetical feedback scenarios. Future research could use weekly or monthly diaries to investigate naturally occurring shifts in impostor feelings when students encounter real-life situations involving positive, mixed, and negative feedback. We did not counterbalance the three hypothetical scenarios. Therefore, it

is difficult to determine if the differences across scenarios are attributable to feedback or an order effect. Similarly, we did not include manipulation checks to ensure that participants interpreted each scenario as we intended and fully understood the differences between them. Our approach relied on “face validity” (i.e., the scenarios appear to be measuring what we tried to measure) and could be criticized as being another “on-the-fly” experiment (Chester & Lasko, 2021). Manipulation checks can threaten inferences by impacting the response process and should also be used with caution (Fayant et al., 2017; Hauser et al., 2018). Therefore, we recommend that future research perform pilot studies to test the construct validity of each scenario before running an experiment measuring how impostor feelings differ across them (Chester & Lasko, 2021). For now, the results of our hypothetical feedback scenarios should be interpreted within the confines of these methodological limitations.

Conclusions

The results of our meta-analysis and two original studies provided support for the idea of separating high and perfectionistic standards to better understand the association between perfectionism and impostor feelings. This association is more nuanced than initially thought. Perfection strivers experience more impostor feelings than excellence strivers, particularly when they feel like their levels of research productivity are unsatisfactory or below average. They also tend to react more negatively to a hypothetical scenario depicting the typical ambiguous and mixed feedback typically received during the peer review process involved in scientific publication. Separating excellencism and perfectionism is necessary to shed light on the pernicious yet complex effect of perfectionistic standards on the experience of impostor feelings of graduate students.

References

- Albert, C., Davia, M. A., & Legazpe, N. (2018). Job satisfaction among academics: the role of research productivity. *Studies in Higher Education*, 43(8), 1362-1377.
<https://doi.org/10.1080/03075079.2016.1255937>
- Allen, M. S., Iliescu, D., & Greiff, S. (2022). Single item measures in psychological science. *European Journal of Psychological Assessment*, 38(1), 1-5. <https://doi.org/10.1027/1015-5759/a000699>
- Bandura, A. (1997). *Self-efficacy : The exercise of control*. Freeman.
- Bernard, D. (2024). Racism and the impostor phenomenon among African American students: A socioecological analysis. In K. Cokley (Ed.), *The impostor phenomenon: Psychological research, theory, and interventions*. (pp. 181-201). American Psychological Association.
<https://doi.org/10.1037/0000397-009>
- Berry, C., Niven, J. E., & Hazell, C. M. (2021). Personal, social and relational predictors of UK postgraduate researcher mental health problems. *BJPsych open*, 7(6), Article e205.
<https://doi.org/10.1192/bjo.2021.1041>
- Blasberg, J. S., Hewitt, P. L., Flett, G. L., Sherry, S. B., & Chen, C. (2016). The importance of item wording: The distinction between measuring high standards versus measuring perfectionism and why it matters. *Journal of Psychoeducational Assessment*, 34, 702-717. <https://doi.org/10.1177/0734282916653701>
- Borenstein, M., Hedges, L. V., Higgins, J., & Rothstein, H. (2007). *Comprehensive meta-analysis*. In (Version 2.0)

- Bravata, D. M., Watts, S. A., Keefer, A. L., Madhusudhan, D. K., Taylor, K. T., Clark, D. M., Nelson, R. S., Cokley, K. O., & Hagg, H. K. (2020). Prevalence, predictors, and treatment of impostor syndrome: A systematic review. *Journal of General Internal Medicine*, 35(4), 1252-1275. <https://doi.org/10.1007/s11606-019-05364-1>
- Brennan-Wydra, E., Chung, H. W., Angoff, N., ChenFeng, J., Phillips, A., Schreiber, J., Young, C., & Wilkins, K. (2021). Maladaptive perfectionism, impostor phenomenon, and suicidal ideation among medical students. *Academic Psychiatry*, 45(6), 708-715. <https://doi.org/10.1007/s40596-021-01503-1>
- Canning, E. A., LaCosse, J., Kroeper, K. M., & Murphy, M. C. (2019). Feeling like an imposter: The effect of perceived classroom competition on the daily psychological experiences of first-generation college students. *Social Psychological and Personality Science*, 11(5), 647-657. <https://doi.org/10.1177/1948550619882032>
- Carless, D., Jung, J., & Li, Y. (2024). Feedback as socialization in doctoral education: towards the enactment of authentic feedback. *Studies in Higher Education*, 49(3), 534-545. <https://doi.org/10.1080/03075079.2023.2242888>
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge University Press.
- Cheek, N. N., & Goebel, J. (2020). What does it mean to maximize?“Decision difficulty,” indecisiveness, and the jingle-jangle fallacies in the measurement of maximizing. *Judgment and Decision Making*, 15(1), 7-24. <https://doi.org/10.1017/s1930297500006884>

- Chester, D. S., & Lasko, E. N. (2021). Construct validation of experimental manipulations in social psychology: Current practices and recommendations for the future. *Perspectives on Psychological Science*, 16(2), 377-395. <https://doi.org/10.1177/1745691620950684>
- Clance, P. R. (1985). *The impostor phenomenon: When success makes you feel like a fake*. Bantam Books.
- Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241-247. <https://doi.org/10.1037/h0086006>
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2002). *Applied multiple regression/correlation analysis for the behavioural sciences* (Vol. null).
- Cokley, K., Stone, S., Krueger, N., Bailey, M., Garba, R., & Hurst, A. (2018). Self-esteem as a mediator of the link between perfectionism and the impostor phenomenon. *Personality and Individual Differences*, 135, 292-297. <https://doi.org/10.1016/j.paid.2018.07.032>
- Cornwall, J., Mayland, E. C., van der Meer, J., Spronken-Smith, R. A., Tustin, C., & Blyth, P. (2019). Stressors in early-stage doctoral students. *Studies in Continuing Education*, 41(3), 363-380. <https://doi.org/10.1080/0158037X.2018.1534821>
- Cowie, M. E., Nealis, L. J., Sherry, S. B., Hewitt, P. L., & Flett, G. L. (2018). Perfectionism and academic difficulties in graduate students: Testing incremental prediction and gender moderation. *Personality and Individual Differences*, 123, 223-228. <https://doi.org/10.1016/j.paid.2017.11.027>
- Crocker, P. R. E., Gaudreau, P., Mosewich, A. D., & Kljajic, K. (2014). Perfectionism and the stress process in intercollegiate athletes: Examining the 2 × 2 model of perfectionism in

- sport competition. *International Journal of Sport Psychology*, 45, 325-348.
<https://doi.org/10.7352/IJSP2014.45.325>
- Curran, T., & Hill, A. P. (2022). Young people's perceptions of their parents' expectations and criticism are increasing over time: Implications for perfectionism. *Psychological Bulletin*, 148, 107-128. <https://doi.org/10.1037/bul0000347>
- Cusack, C. E., Hughes, J. L., & Nuhu, N. (2013). Connecting gender and mental health to imposter phenomenon feelings. *Psi Chi Journal of Psychological Research*, 18(2), 74-81.
<https://doi.org/10.24839/2164-8204.JN18.2.74>
- de Vries, M. (2005). The dangers of feeling like a fake. *Harvard Business Review*, 83(9), 108.
- Devos, C., Boudrenghien, G., Van der Linden, N., Azzi, A., Frenay, M., Galand, B., & Klein, O. (2017). Doctoral students' experiences leading to completion or attrition: a matter of sense, progress and distress. *European Journal of Psychology of Education*, 32(1), 61-77.
<https://doi.org/10.1007/s10212-016-0290-0>
- Dudău, D. P. (2014). The relation between perfectionism and impostor phenomenon. *Procedia - Social and Behavioral Sciences*, 127, 129-133.
<https://doi.org/10.1016/j.sbspro.2014.03.226>
- Egan, S. J., Wade, T. D., Shafran, R., & Antony, M. M. (2016). *Cognitive-behavioural treatment of perfectionism*. Guilford.
- Ellis, A. (2002). The role of irrational beliefs in perfectionism. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 285-316). American Psychological Association.
- Erekson, D. M., Larsen, R. A., Clayton, C. K., Hamm, I., Hoskin, J. M., Morrison, S., Vogeler, H. A., Merrill, B. M., Griner, D., & Beecher, M. E. (2024). Is the measure good enough?

- Measurement invariance and validity of the Clance Imposter Phenomenon Scale in a university population. *Psychological Reports*, 127(4), 1984-2004.
<https://doi.org/10.1177/00332941221139991>
- Fakunmoju, S. B. (2020). Validity of single-item versus multiple-item job satisfaction measures in predicting life satisfaction and turnover intention. *Asia-Pacific Journal of Management Research and Innovation*, 16(3), 210-228. <https://doi.org/10.1177/2319510x21997724>
- Fayant, M.-P., Sigall, H., Lemonnier, A., Retsin, E., & Alexopoulos, T. (2017). On the limitations of manipulation checks: An obstacle toward cumulative science. *International Review of Social Psychology*, 30(1), 125-130. <https://doi.org/10.5334/irsp.102>
- Flett, G. L., Hewitt, P. L., Blankstein, K. R., & Mosher, S. W. (1995). Perfectionism, life events, and depressive symptoms: A test of a diathesis-stress model. *Current Psychology* 14, 112-137. <https://doi.org/10.1007/BF02686885>
- Flett, G. L., Hewitt, P. L., Whelan, T., & Martin, T. R. (2007). The Perfectionism Cognitions Inventory: Psychometric properties and associations with distress and deficits in cognitive self-management. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 25, 255-277. <https://doi.org/10.1007/s10942-007-0055-4>
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, 14, 449-468. <https://doi.org/10.1007/BF01172967>
- Gardner, S. K. (2008). Fitting the mold of graduate school: A qualitative study of socialization in doctoral education. *Innovative Higher Education*, 33(2), 125-138.
<https://doi.org/10.1007/s10755-008-9068-x>

- Gaudreau, P. (2019). On the distinction between personal standards perfectionism and excellencism: A theory elaboration and research agenda. *Perspectives on Psychological Science*, 14, 197-215. <https://doi.org/10.1177/1745691618797940>
- Gaudreau, P. (2021). Separating the core definitional feature and the signature expressions of dispositional perfectionism: Implications for theory, research, and practice. *Personality and Individual Differences*, 181, 110975. <https://doi.org/10.1016/j.paid.2021.110975>
- Gaudreau, P., Benoit, A., & Boileau, L. (2023). Questions, critical reflections, and advances with the Model of Excellencism and Perfectionism. In A. P. Hill (Ed.), *Perfectionism in sport, dance, and exercise* (2nd ed., pp. 377-398). Routledge.
- Gaudreau, P., Boivin, T., Racine, P., Parent, G., Boileau, L., & Schellenberg, B. J. I. (2024). Striving for excellence or chasing perfection? Differential associations with test anxiety for students in tertiary education. *Submitted for publication*.
- Gaudreau, P., Schellenberg, B. J. I., Gareau, A., Kljajic, K., & Manoni-Millar, S. (2022). Because excellencism is more than good enough: On the need to distinguish the pursuit of excellence from the pursuit of perfection. *Journal of Personality and Social Psychology*, 122, 1117–1145. <https://doi.org/10.1037/pspp0000411>
- Gaudreau, P., Schellenberg, B. J. I., & Quesnel, M. (2024). From theory to research: Interpretational guidelines, statistical guidance, and a Shiny App for the Model of Excellencism and Perfectionism. *European Journal of Personality*, 38, 839-860. <https://doi.org/10.1177/08902070231221478>
- Goulet-Pelletier, J.-C., Gaudreau, P., & Cousineau, D. (2022). Is perfectionism a killer of creative thinking? A test of the model of excellencism and perfectionism. *British Journal of Psychology*, 113, 176-207. <https://doi.org/10.1111/bjop.12530>

- Gullifor, D. P., Gardner, W. L., Karam, E. P., Noghani, F., & Cogliser, C. C. (2023). The impostor phenomenon at work: A systematic evidence-based review, conceptual development, and agenda for future research. *Journal of Organizational Behavior*, 45, 234-251.
<https://doi.org/10.1002/job.2733>
- Hatch, T., & Skipper, A. (2016). How much are PhD students publishing before graduation?: An examination of four social science disciplines. *Journal of Scholarly Publishing*, 47(2), 171-179. <https://doi.org/10.3138/jsp.47.2.171>
- Hauser, D. J., Ellsworth, P. C., & Gonzalez, R. (2018). Are manipulation checks necessary? [Review]. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.00998>
- Haynes, S. N., Richard, D. C., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment*, 7, 238-247. <https://doi.org/10.1037/1040-3590.7.3.238>
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, 60, 456-470. <https://doi.org/10.1037/0022-3514.60.3.456>
- Hewitt, P. L., Flett, G. L., & Mikail, S. F. (2017). *Perfectionism: A relational approach to conceptualization, assessment, and treatment*. Guilford.
- Hewitt, P. L., Flett, G. L., Sherry, S. B., Habke, M., Parkin, M., Lam, R. W., McMurtry, B., Ediger, E., Fairlie, P., & Stein, M. B. (2003). The interpersonal expression of perfection: Perfectionistic self-presentation and psychological distress. *Journal of Personality and Social Psychology*, 84, 1303-1325. <https://doi.org/10.1037/0022-3514.84.6.1303>

- Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ*, 327. <https://doi.org/10.1136/bmj.327.7414.557>
- Hill, R. W., Huelsman, T. J., Furr, R. M., Kibler, J., Vicente, B. B., & Kennedy, C. (2004). A new measure of perfectionism: The Perfectionism Inventory. *Journal of Personality Assessment*, 82(1), 80-91. https://doi.org/10.1207/s15327752jpa8201_13
- Hoover, K. B., & Lucas, K. T. (2023). Mentoring graduate students: A study on academic rejection, the pressure to publish, and career paths. *Journal of Criminal Justice Education*, 1-23. <https://doi.org/10.1080/10511253.2023.2173792>
- Hudson, S., & González-Gómez, H. V. (2021). Can impostors thrive at work? The impostor phenomenon's role in work and career outcomes. *Journal of Vocational Behavior*, 128, 103601. <https://doi.org/10.1016/j.jvb.2021.103601>
- Hutchins, H. M., Penney, L. M., & Sublett, L. W. (2018). What imposters risk at work: Exploring imposter phenomenon, stress coping, and job outcomes. *Human Resource Development Quarterly*, 29(1), 31-48. <https://doi.org/https://doi.org/10.1002/hrdq.21304>
- Ibrahim, F., Münscher, J.-C., & Herzberg, P. Y. (2022). The facets of an impostor—development and validation of the Impostor-Profile (IPP31) for measuring impostor phenomenon. *Current Psychology*, 41(6), 3916-3927. <https://doi.org/10.1007/s12144-020-00895-x>
- Jaremka, L. M., Ackerman, J. M., Gawronski, B., Rule, N. O., Sweeny, K., Tropp, L. R., Metz, M. A., Molina, L., Ryan, W. S., & Vick, S. B. (2020). Common academic experiences no one talks about: Repeated rejection, impostor syndrome, and burnout. *Perspectives on Psychological Science*, 15(3), 519-543. <https://doi.org/10.1177/1745691619898848>

- Jonas, E. A., & Hall, N. C. (2022). Writing and reading self-efficacy in graduate students: Implications for psychological well-being. *Interdisciplinary Education and Psychology*, 3(1), 1-14.
- Jones, A., Schuhmann, P., Soques, D., & Witman, A. (2020). So you want to go to graduate school? Factors that influence admissions to economics PhD programs. *The Journal of Economic Education*, 51(2), 177-190. <https://doi.org/10.1080/00220485.2020.1731385>
- Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research*, 44(3), 486-507. <https://doi.org/10.1177/0049124114543236>
- Kerr, S., & LePelley, D. (2013). Stretch goals: Risks, possibilities, and best practices. In E. A. Locke & G. P. Latham (Eds.), *New developments in goal setting and task performance*. (pp. 21-31). Routledge.
- Klug, H. J. P., & Maier, G. W. (2015). Linking goal progress and subjective well-being: A meta-analysis. *Journal of Happiness Studies*, 16(1), 37-65. <https://doi.org/10.1007/s10902-013-9493-0>
- Kuncel, N. R., Hezlett, S. A., & Ones, D. S. (2001). A comprehensive meta-analysis of the predictive validity of the Graduate Record Examinations: Implications for graduate student selection and performance. *Psychological Bulletin*, 127(1), 162-181. <https://doi.org/10.1037/0033-2909.127.1.162>
- Leary, M. R., Patton, K. M., Orlando, A. E., & Wagoner Funk, W. (2000). The impostor phenomenon: Self-perceptions, reflected appraisals, and interpersonal strategies. *Journal of Personality*, 68(4), 725-756. <https://doi.org/10.1111/1467-6494.00114>

- Leonard, N. H., & Harvey, M. (2008). Negative perfectionism: Examining negative excessive behavior in the workplace. *Journal of Applied Social Psychology*, 38(3), 585-610.
<https://doi.org/10.1111/j.1559-1816.2007.00318.x>
- Leonhardt, M., Bechtoldt, M. N., & Rohrmann, S. (2017). All impostors aren't alike: Differentiating the impostor phenomenon. *Frontiers in Psychology*, 8.
<https://doi.org/10.3389/fpsyg.2017.01505>
- Levine, S. L., Milyavskaya, M., & Zuroff, D. C. (2020). Perfectionism in the transition to university: Comparing diathesis-stress and downward spiral models of depressive symptoms. *Clinical Psychological Science*, 8, 52-64.
<https://doi.org/10.1177/2167702619865966>
- Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2017). The relationship between perfectionism and psychopathology: A meta-analysis. *Journal of Clinical Psychology*, 73, 1301-1326. <https://doi.org/10.1002/jclp.22435>
- Liu, L. M., Han, Y. C., Lu, Z., Cao, C. J., & Wang, W. C. (2023). The relationship between perfectionism and depressive symptoms among Chinese college students: The mediating roles of self-compassion and impostor syndrome. *Current Psychology*, 42(22), 18823-18831. <https://doi.org/10.1007/s12144-022-03036-8>
- Livinți, R., Gunnesch-Luca, G., & Iliescu, D. (2021). Research self-efficacy: A meta-analysis. *Educational Psychologist*, 56(3), 215-242.
<https://doi.org/10.1080/00461520.2021.1886103>
- Locke, E. A., & Latham, G. P. (Eds.). (2013). *New developments in goal setting and task performance*. Routledge.

- Marshall, K., Forbes, A., Kearns, H., & Gardiner, M. (2008). When a high distinction isn't good enough: A review of perfectionism and self-handicapping. *Australian Educational Researcher*, 35(3), 21-36.
- McNeish, D., An, J., & Hancock, G. R. (2018). The thorny relation between measurement quality and fit index cutoffs in latent variable models. *Journal of Personality Assessment*, 100(1), 43-52. <https://doi.org/10.1080/00223891.2017.1281286>
- Muthén, B. O., & Muthén, L. K. (2000). The development of heavy drinking and alcohol-related problems from ages 18 to 37 in a US national sample. *Journal of Studies on Alcohol*, 61, 290-300. <https://doi.org/10.15288/jsa.2000.61.290>
- Muthén, L. K., & Muthén, B. (2024). *Mplus*. In (Version 10) Muthén & Muthén.
- Neufeld, A., Babenko, O., Lai, H., Svrcek, C., & Malin, G. (2023). Why do we feel like intellectual frauds? A Self-Determination Theory perspective on the impostor phenomenon in medical students. *Teaching and Learning in Medicine*, 35(2), 180-192. <https://doi.org/10.1080/10401334.2022.2056741>
- Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, 32, 972-983. <https://doi.org/10.1037/pas0000942>
- Pákozdy, C., Askew, J., Dyer, J., Gately, P., Martin, L., Mavor, K. I., & Brown, G. R. (2023). The imposter phenomenon and its relationship with self-efficacy, perfectionism and happiness in university students. *Current Psychology*. <https://doi.org/10.1007/s12144-023-04672-4>
- Pezzoni, M., Mairesse, J., Stephan, P., & Lane, J. (2016). Gender and the publication output of graduate students: A case study. *PLoS ONE*, 11(1), e0145146. <https://doi.org/10.1371/journal.pone.0145146>

Price, P. C., Holcomb, B., & Payne, M. B. (2024). Gender differences in impostor phenomenon:

A meta-analytic review. *Current Research in Behavioral Sciences*, 7, 100155.

<https://doi.org/10.1016/j.crbeha.2024.100155>

Raykov, T., & Marcoulides, G. A. (2004). Using the delta method for approximate interval

estimation of parameter functions in SEM. *Structural Equation Modelling*, 11, 621-637.

https://doi.org/10.1207/s15328007sem1104_7

Rosenberg, M. S. (2005). The file-drawer problem revisited: A general weighted method for

calculating fail-safe numbers in meta-analysis. *Evolution*, 59(2), 464-468.

<https://doi.org/10.1111/j.0014-3820.2005.tb01004.x>

Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2014). P-curve: a key to the file-drawer.

Journal of Experimental Psychology: General, 143(2), 534-547.

<https://doi.org/10.1037/a0033242>

Simonsohn, U., Simmons, J. P., & Nelson, L. D. (2015). Better P-curves: Making P-curve

analysis more robust to errors, fraud, and ambitious P-hacking, a Reply to Ulrich and

Miller (2015). *Journal of Experimental Psychology: General*, 144(6), 1146-1152.

<https://doi.org/10.1037/xge0000104>

Sirois, F. M. (2016). Perfectionism and health behaviors: A self-regulation resource perspective.

In F. M. Sirois & D. S. Molnar (Eds.), *Perfectionism, Health, and Well-Being* (pp. 45-67).

Springer.

Sirois, F. M., & Molnar, D. S. (2016). Conceptualizations of perfectionism, health, and well-

being: An introductory overview. In F. Sirois & D. S. Molnar (Eds.), *Perfectionism,*

health, and well-being (pp. 1-24). Springer.

- Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The Revised Almost Perfect Scale. *Measurement & Evaluation in Counseling & Development*, 34, 130-145.
<https://doi.org/10.1080/07481756.2002.12069030>
- Smith, M. M., Saklofske, D. H., Stoeber, J., & Sherry, S. B. (2016). The Big Three Perfectionism Scale: A new measure of perfectionism. *Journal of Psychoeducational Assessment*, 34, 670-687. <https://doi.org/10.1177/0734282916651539>
- Smith, M. M., Sherry, S. B., Ge, S. Y., Hewitt, P. L., Flett, G. L., & Baggle, D. L. (2022). Multidimensional perfectionism turns 30: A review of known knowns and known unknowns. *Canadian Psychology*, 63, 16-31. <https://doi.org/10.1037/cap0000288>
- Smith, M. M., Sherry, S. B., Ray, C., Hewitt, P. L., & Flett, G. L. (2021). Is perfectionism a vulnerability factor for depressive symptoms, a complication of depressive symptoms, or both? A meta-analytic test of 67 longitudinal studies. *Clinical Psychology Review*, 84, 101982. <https://doi.org/10.1016/j.cpr.2021.101982>
- Stachl, C. N., & Baranger, A. M. (2020). Sense of belonging within the graduate community of a research-focused STEM department: Quantitative assessment using a visual narrative and item response theory. *PLoS ONE*, 15(5), e0233431.
<https://doi.org/10.1371/journal.pone.0233431>
- Stairs, A. M., Smith, G. T., Zapolski, T. C. B., Combs, J. L., & Settles, R. E. (2012). Clarifying the construct of perfectionism. *Assessment*, 19(2), 146-166.
<https://doi.org/10.1177/1073191111411663>
- Stoeber, J. (2018). The psychology of perfectionism: An introduction. In J. Stoeber (Ed.), *The psychology of perfectionism: Theory, research, applications*. (pp. 3-16). Routledge.

- Tape, N., Dry, M., Monaghan, B., Tan, N., & Turnbull, D. (2024). The Scale of Perfectionism and Excellencism (SCOPE): an adolescent-based validation study for the measurement of perfectionism and excellencism. *Educational and Developmental Psychologist, 41*, 3-11. <https://doi.org/10.1080/20590776.2023.2289627>
- Tigranyan, S., Byington, D. R., Liupakorn, D., Hicks, A., Lombardi, S., Mathis, M., & Rodolfa, E. (2021). Factors related to the impostor phenomenon in psychology doctoral students. *Training and Education in Professional Psychology, 15*(4), 298-305. <https://doi.org/10.1037/tep0000321>
- Vergauwe, J., Wille, B., Feys, M., De Fruyt, F., & Anseel, F. (2015). Fear of being exposed: The trait-relatedness of the impostor phenomenon and its relevance in the work context. *Journal of Business and Psychology, 30*(3), 565-581. <https://doi.org/10.1007/s10869-014-9382-5>
- Waleriańczyk, W., Hill, A. P., & Stolarski, M. (2023). A conditional process model of perfectionism, goal-realization, and post-competition mood. *Psychology of Sport and Exercise, 69*, 102511. <https://doi.org/10.1016/j.psychsport.2023.102511>
- Walker, D. L., & Saklofske, D. H. (2023). Development, factor structure, and psychometric validation of the impostor phenomenon assessment: A novel assessment of impostor phenomenon. *Assessment, 30*(7), 2162-2183. <https://doi.org/10.1177/10731911221141870>
- Wang, K. T., Sheveleva, M. S., & Permyakova, T. M. (2019). Imposter syndrome among Russian students: The link between perfectionism and psychological distress. *Personality and Individual Differences, 143*, 1-6. <https://doi.org/10.1016/j.paid.2019.02.005>

CHAPTER 3

Chasing Perfection, Feeling Like a Fraud: How Signature Expressions of Perfectionism are Associated with Impostor Feelings in a Two-Wave Longitudinal Study

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ABSTRACT

The present study investigated the relationship between perfectionism and the experience of impostor feelings among graduate students. Drawing on the Model of Excellencism and Perfectionism (MEP), we examined how perfectionistic self-presentation, and perfectionistic concerns mediate the link between perfectionistic standards and impostor feelings. A two-wave longitudinal design was used, with 393 graduate students participating at Time 1 and 256 completing follow-up assessments at Time 2. Cross-sectional and prospective mediation analyses revealed that perfectionistic standards, but not excellencism, was positively indirectly associated with the experience of impostor feelings through signature expressions of perfectionism. Importantly, the enactment of these mechanisms predicted a recursive cycle of impostor feelings over time, supporting the notion of a self-perpetuating *impostor cycle*. These findings clarify the previously convoluted association between perfectionistic standards and the experience of impostor feelings, demonstrating that their unhealthy effects operate through the expression of perfectionistic self-presentation and perfectionistic concerns. Our results highlight the necessity of distinguishing between perfectionism and excellencism in theoretical models to inform practical interventions. Findings revealed that, beyond the excellencism, perfectionistic standards uniquely and indirectly heightened the experience of impostor feelings among graduate students, operating through perfectionistic self-presentation and concerns. This research contributes to a growing body of literature advocating for a nuanced approach to understanding impostor feelings and perfectionism, particularly in high-achieving academic environments.

Keywords: *perfectionism, excellencism, model of excellencism and perfectionism, impostor phenomenon, graduate students*

Chasing Perfection, Feeling Like a Fraud: How Signature Expressions of Perfectionism are Associated with Impostor Feelings in a Two-Wave Longitudinal Study

Magalie, an experienced senior graduate student, stared at the acceptance email for their article, now set to be published in a scientific journal. While the news should have brought relief, doubts quickly crept in. The paper had gone through multiple rounds of revisions, with their supervisor heavily involved in rewriting sections. Magalie worried the acceptance was more due to their supervisor's input than their own efforts. They also feared judgment from colleagues, as the journal was not as prestigious as they had hoped. Feeling undeserving of the achievement, Magalie decided to keep the publication quiet. In contrast, Alex, a fellow graduate student and collaborator on the manuscript, felt proud and excited. For Alex, the acceptance reflected their hard work, perseverance, and teamwork, viewing their supervisor's contributions as a natural part of the process. Confident in their abilities and despite the journal's not being the most prestigious, Alex openly celebrated the achievement, eager to share the news with others.

The negative experience that leads Magalie and other high-achieving individuals to continuously question the legitimacy of their abilities, despite their objective success, is known as the impostor phenomenon and was first introduced by Clance and Imes (1978). Individuals who experience the impostor phenomenon irrationally believe that their successes can only be explained by sheer luck or that they require a tremendous level of effort, rather than being the result of their own abilities (Clance, 1985). Moreover, this experience is also accompanied by a self-convincing fear of being exposed as an impostor or a fraud to others because of their perceived inadequacies (Clance, 1985).

Furthermore, central to the impostor phenomenon theory is the *impostor cycle*, which alludes to a recurring and self-perpetuating pattern of maladaptive thoughts and behaviours

sustaining impostor feelings (Clance, 1985; Sakulku & Alexander, 2011). This cycle is typically initiated when individuals are faced with achievement tasks, which evoke heightened anxiety, self-doubt, and bring them to engage in maladaptive behaviours such as intense over-preparation. However, upon completion of the task, they attribute their success to external factors rather than their abilities, and are dismissive of positive feedback, which inadvertently perpetuates their experience of feeling like impostors, despite repeated success (Sakulku & Alexander, 2011).

The impostor phenomenon is not classified as an official psychological disorder (Bravata et al., 2019) despite having its roots directly in clinical observations (Clance, 1985; Clance & Imes, 1978). Also, the impostor phenomenon is often referred to as *impostor syndrome* in the non-academic literature (Bravata et al., 2019), which implies a strong negative connotation and is considered a misnomer according to Clance and Lawry (2024). As a result, there has been a considerable focus on investigating how various concepts are associated with the impostor phenomenon. For example, the impostor phenomenon has been found to be positively correlated with negative outcomes such as depression (Tigranyan et al., 2020) and anxiety (Cowie et al., 2018). Also, it has been negatively related to more desirable outcomes such as well-being (Pákozdy et al., 2024) and self-esteem (Sonnak & Towell, 2001). This contributed to reinforcing the idea that the impostor phenomenon is a complex dispositional trait often associated with undesirable intrapersonal and interpersonal correlates.

Recent concerns have been raised a (Gullifor et al., 2023) about the existing literature on the impostor phenomenon, as it often outlines and reports conclusions that are inadequately defined and, in some cases, inaccurately represented (Gullifor et al., 2023). To that end, Gullifor and colleagues (2023) proposed a novel and nuanced framework that positions the known correlates of the trait-impostor phenomenon as potential antecedents of the state-impostor

phenomenon. Whereas the trait-impostor phenomenon reflects a stable and enduring predisposition, the state-impostor phenomenon captures the temporary and context-dependent enactment of impostor feelings (Gullifor et al., 2023). For example, the tendency to experience the impostor phenomenon in general across life activities is a disposition that can influence how much a person experiences the impostor phenomenon in specific aspects of their life, such as in school-related activities. According to their model, both the trait and the state-impostor phenomenon must be considered to provide a better understanding of the overall experience of the impostor phenomenon.

Despite this promising framework, research has predominantly focused on the trait-impostor phenomenon, and far less attention has been given to the situational antecedents that can alter the experience of the state-impostor phenomenon (Gullifor et al., 2023). This knowledge gap limits our ability to fully grasp the roles of interpersonal antecedents in the enactment of the impostor phenomenon. As such, further investigation is needed to explore the interplay between these antecedents and their influence on the contextual experience of impostor feelings. Additionally, to better highlight the potentially dynamic nature of the state-impostor phenomenon, we will hereafter refer to it as the experience of impostor feelings, as we aim to investigate how theory-driven antecedents are associated with the phenomenological experience of feeling like an impostor.

The idea that the experience of impostor feelings can be triggered by a combination of dispositional and clear contextual antecedents remains understudied (e.g., Canning et al., 2020; Leary et al., 2000). Moreover, in many cases, the effect of contextual factors could have been, in fact, unjustifiably attributed to the associations of stable dispositions closely related to the experience of impostor feelings (Gullifor et al., 2023). The case of how perfectionism is

theoretically linked to the experience of impostor feelings (Thompson et al., 2000; Wang et al., 2019), represents a compelling example of how dispositional traits and antecedental factors can be misattributed in the experience of impostor feelings.

The Case of Perfectionism

Perfectionism is commonly understood as a multidimensional construct (Stoeber & Otto, 2006). Among which, *perfectionistic standards* refer to the tendency to set extremely high and rigid personal standards, alongside a relentless pursuit of flawlessness, which is frequently seen as being central to perfectionism. Also, this striving for flawlessness is often accompanied by broader *perfectionistic concerns* that include persistent doubts, concerns and self-critical appraisal in conjunction with pervasive socio-behavioural tendencies (i.e., *perfectionistic self-presentation*) (Hewitt et al., 2003; Gaudreau, 2021). Together, these continuous dimensions shape the intricacies behind the phenomenological experience of perfectionism, as strivings become intertwined with self-criticism and efforts to manage how perfection is perceived and enacted in social contexts.

These two dimensions exhibit distinct patterns of association with outcomes such as psychological distress, despite being correlated with one another (Hewitt et al., 2003; Limburg et al., 2017; Stoeber et al., 2020). Considering the positive correlation between perfectionistic concerns and perfectionistic standards (Stoeber & Otto, 2006), only perfectionistic concerns have been consistently found to be associated with negative outcomes, while perfectionistic standards can be found to be associated with positive outcomes. For example, in Gotwals and colleagues (2012), perfectionistic standards among athletes were found to be predominantly related to adaptive outcomes, when controlling for the pervasive effect of perfectionistic concerns (see Gotwals et al., 2012, p. 19). However, previous conceptualization of perfectionistic standards

tends to conflate the pursuit of all types of high standards, thereby potentially overestimating the adaptive role of perfectionism by failing to distinguish between potentially healthy and maladaptive forms of high standards (Gaudreau et al., 2023).

The recently proposed *Model of Excellencism and Perfectionism* (MEP; Gaudreau, 2019, 2021) provides a revised conceptual framework of perfectionism. Two distinctions are proposed. Initially, the MEP distinguished between the pursuit of excellence and perfection, which had previously been confounded under perfectionistic standards (Stoeber & Gaudreau, 2017). According to the MEP, excellencism refers to the setting of very high yet flexible personal standards (e.g., aspiring to have good performances), while perfectionism is rather defined by the setting and pursuit of unattainable and rigid personal standards (e.g., aspiring to have perfect performances). The latter is highly characteristic of dispositional perfectionism, as those who pursue personal standards of perfection will go beyond reaching mere excellence (Gaudreau, 2021) because for them, a good performance is never good enough.

Additionally, the MEP repositions perfectionistic standards as the core dispositional feature of perfectionism, while its cognitive, socio-cognitive, and socio-behavioural manifestations are referred to as *signature expressions of perfectionism* (Gaudreau, 2021). These signature expressions of perfectionism are known to typically co-occur with the broader experience of perfectionism that emerges from the aiming and striving toward perfection. In other words, the experiences that accompany the pursuit of perfection are not perfectionism per se, but expressions typically associated with the pursuit of perfectionistic standards (Gaudreau, 2021). In this sense, perfectionistic standards are considered the core defining feature of perfectionism. In other words, the MEP offers a clarifying framework by positioning perfectionistic standards as the necessary condition for what is considered as *perfectionism*,

while recognizing that the signature expressions are correlated but not defining aspects (Gaudreau, 2021).

Building on this premise, it is important to further consider how the MEP proposes to clarify the unique contribution of perfectionistic standards beyond excellencism, by highlighting an underlying network of paths linked to the behavioural and psychological experiences of individuals who pursue perfection (Gaudreau et al., 2022). We know that perfectionistic standards are consistently positively correlated with expressions of perfectionism, while excellencism is not (e.g., Goulet-Pelletier et al., 2025). Specifically, Goulet-Pelletier and colleagues (2025) reported that only perfectionism (not excellencism) held a significant relationship with both concerns over mistakes and doubts about action. Similarly, Gaudreau (2021) and Gaudreau and colleagues (2023) reanalyzed the results from the meta-analysis of Hill and Curran (2015) and Hill and colleagues (2018). The results of meta-analytical path analyses indicated that perfectionistic standard positively relates to perfectionism concern which, in turn, is positively associated with burnout and negatively associated with self-esteem. Therefore, perfectionistic standards are part of a network of indirect associations in which expressions of perfectionism (i.e., concerns) are more proximal, stronger, and direct predictors of psychological adjustment.

Interpersonal Antecedents of the Experience of Impostor Feelings

The idea that perfectionism and the experience of impostor feelings are associated has long been theorized. As noted by Clance (1985), “Impostors are very perfectionistic in almost every aspect of their performance” (p. 26). Despite this claim, research on the association between perfectionism and impostor feelings has resulted in mixed findings.

On the one hand, the associations between *perfectionistic concerns* and the experience of impostor feelings have consistently been shown to be positive (Brennan-Wydra et al., 2021; Tigranyan et al., 2020; Wang et al., 2019). Other signature expressions of perfectionism, such as perfectionistic self-presentation (Cowie et al., 2018) and overly self-critical thinking (Pannhausen et al., 2020), are notably associated with the experience of impostor feelings. Perfectionistic self-presentation is characterized by a tendency to avoid displaying imperfections to others (Hewitt et al., 2003), while self-critical thinking is marked by a higher sensitivity to personal inadequacies and failures (Frost et al., 1990). When positioned within the MEP framework, perfectionistic self-presentation is referred to as a socio-behavioural expression of perfectionism, while self-critical thinking is referred to as a cognitive expression of perfectionism (Gaudreau, 2021). Both signature expressions of perfectionism should be positively associated with perfectionistic standards and impostor feelings.

On the other hand, past research has produced mixed findings between perfectionistic standards and the experience of impostor feelings. Two points are worthy of discussion. First, the meta-analysis by Benoit and colleagues (2025) revealed that the purest measures of perfectionistic standards (i.e., the ones not conflating excellencism with perfectionism) were positively associated with impostor feelings. Questionnaires that measured high standards rather than perfectionistic standards were not significantly associated with impostor feelings. Therefore, it appears that the concepts of excellencism and perfectionistic standards have a different association with impostor feelings. Second, the meta-analysis of Benoit and colleagues (2025) also showed that the association between perfectionistic standards and the experience of impostor feelings was weaker than the association between perfectionistic concerns and impostor feelings. This finding is consistent with the hypothesis of the MEP, which posits that

perfectionistic standards and perfectionistic concerns as distal and proximal predictors of psychological maladjustment, respectively. In other words, signature expressions of perfectionism, such as perfectionistic concerns and perfectionistic self-presentation, are repositioned as mechanisms that could potentially explain how perfectionistic standards are indirectly associated with the experience of impostor feelings.

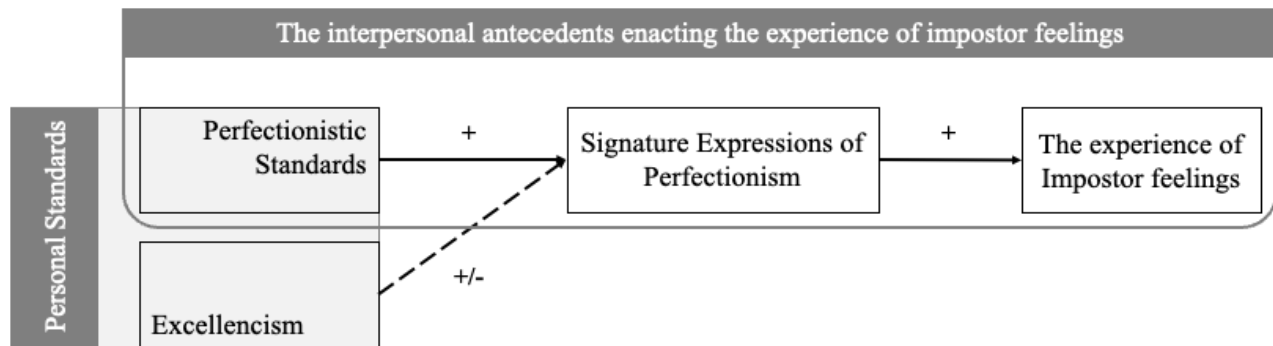
The Current Study

The overarching goal of this study was to examine the conceptual model proposed in the MEP. This model differs from previous studies in two ways. First, improved measurement allows distinguishing excellencism from perfectionistic standards. Therefore, we expected that perfectionistic standards (but not excellencism) should be positively associated with impostor feelings. Second, the model repositions perfectionistic standards as the core definitional feature of perfectionism and perfectionistic concerns as signature expressions of perfectionism. As shown in Figure 1, this model proposes that perfectionistic concerns are enacted or fuelled by perfectionistic standards. They are unique to perfectionism because they are not expected to be positively associated with excellencism. Perfectionistic standards are the distal predictor of impostor feelings because they are associated with expressions of perfectionism (e.g., perfectionistic concerns and self-presentation), which are more proximally associated with impostor feelings. If so, perfectionistic standards are indirectly associated with impostor feelings in a network of associations with the signature expressions of perfectionism.

Figure 3.1

Conceptual Model of Perfectionistic Standards as Distal Antecedents of Impostor Feelings

Through the Enactment of Signature Expressions of Perfectionism



Note. This conceptual model is adapted from the MEP framework depicted in Gaudreau (2021).

We relied on a short-term prospective/longitudinal design to assess the hypotheses of the MEP. Past studies reviewed in the meta-analysis by Benoit and colleagues (2025) all relied on a cross-sectional design. Therefore, our first model tested the MEP hypotheses by looking at contemporaneous associations at Time 1 and Time 2. This was deemed valuable for drawing comparisons across time points, while also facilitating comparisons with previous studies looking at perfectionism and impostor feelings. Our second model examined the prospective association of excellencism and perfectionistic standards at Time 1 with subsequent perfectionistic concerns, perfectionistic self-presentation, and impostor feelings at Time 2. This model was necessary for drawing clearer inferences about the idea that perfectionistic standards are distally associated with impostor feelings, because of their prospective role in the enactment of signature expressions of perfectionism. Finally, our third model explored the hypothesis of an *impostor cycle* in which impostor feelings can prospectively influence signature expressions of perfectionism which, in turn, can be associated with significant changes in impostor feelings.

Support for this model would provide initial support for a complex network of reciprocal associations between perfectionism and impostor feelings.

Method

Open Science Statement

The hypotheses of this study were not preregistered, but they were based on those from the MEP.

Design and Procedures

We conducted a four-month prospective/longitudinal study with two data collection waves. Participants completed the same self-reported questionnaire at the end of the summer (August; Time 1) and at the start of the winter (January; Time 2). These points were deemed relevant periods when students think about and look back on their experiences as graduate students. Participants were recruited via Prolific Academic as part of a broader research project examining the psychological experiences of graduate students (reference masked for peer review). To be eligible for this study, participants had to be actively enrolled in a graduate program, including master's, Ph.D., or other doctoral studies. At Time 1, participants provided electronic written consent and completed a set of self-reported online questionnaires, which took approximately 15 minutes. Those who participated in Time 1 were invited to complete a second questionnaire. A total of 402 participants were recruited for this study, as part of a broader research program. After each questionnaire, participants received a small monetary compensation of 3.85 CAD. The research protocol was approved by the University of Ottawa's Research and Ethics Board, and all participants provided electronic written informed consent at both time points.

Out of the 402 participants initially recruited, seven were excluded from further analysis because they failed to correctly answer attention checks. The final sample for our analyses included 395 participants, aged between 20 and 50 years ($M = 30.48$, $SD = 8.84$). Of these participants, 61.6% identified as women, 36.1% as men, and 2.3% as another gender. Regarding ethnicity, the participants identified as White (67.1%), East Asian (7.4%), Black (5.6%), South Asian (5.6%), Latino (4.6%), Multicultural (4.3%), Middle Eastern (2%), Indigenous (0.8%), and other cultural backgrounds (2.6%). Most participants were from the United Kingdom (58.4%), followed by the United States (28.5%), Australia (6.1%), Canada (5.1%), and other countries (3.1%). Most were enrolled in a master's program (64.4%), followed by doctoral programs (32.4%), combined master-doctoral programs (1.5%), and other graduate programs (1.8%). Additionally, the majority were full-time students (64.6%), while the rest were part-time (34.6%) or awaiting graduation (0.8%). Regarding their academic progression, most participants were in their first year (36.1%) or second year (35.1%), compared to those in their third year (12.2%), fourth year (8.9%), or fifth year and beyond (7.7%).

Measures

Perfectionism and Excellencism

Perfectionism and excellencism were assessed with the Scale of Perfectionism and Excellencism (SCOPE; Gaudreau et al., 2022), comprising 22 items evenly divided between two factors. Participants rated the extent to which each item represented their goals in life on a 7-point Likert scale, ranging from 1 (*not at all agree*) to 7 (*totally agree*). The SCOPE contains two subscales measuring perfectionism (e.g., “have perfect performance”) and excellencism (e.g., “have very good performance”) (Gaudreau et al., 2022; With et al., 2024). Evidence for the two-factor model has been reported in samples of young adults (Gaudreau et al., 2022), adolescents

(Tape et al., 2024), and graduate students (Gaudreau & Benoit, 2025), with high internal consistency for the scores of both perfectionism ($\omega = .96$) and excellencism ($\omega = .91$). In this sample, the internal consistency of excellencism was $\omega = .95$ at both Time 1 and 2. For perfectionism, the internal consistency was $\omega = .97$ at Time 1 and $\omega = .98$ at Time 2. A strong test-retest correlation was observed between excellencism across times ($r = .71$), as well as between perfectionism at Time 1 and Time 2 ($r = .74$).

Perfectionistic Self-Presentation

Participants completed the 18-item version of the *Perfectionistic Self-Presentation Scale–Junior Form* (PSPS-Jr.; Hewitt et al., 2011). Consistent with the study by Gaudreau and Benoit (2025) with graduate students, the scale was adapted to ask graduate students to refer to their relationship with their supervisor. They were told that the word supervisor referred to the individual(s) who is(are) responsible for supervising critical tasks of their graduate studies (e.g., research, clinical internship). The PSPS-Jr. contains three subscales: Perfectionistic self-promotion (8 items; e.g., “I try hard to look perfect around my supervisor”), non-display of imperfection (6 items; e.g., “I want my supervisor to know about it when I do something well”), and nondisclosure of imperfection (4 items; e.g., “I do not let my supervisor know when I fail at something”). Graduate students rated each item on a 7-point Likert scale ranging from 1 (*not at all agree*) to 7 (*totally agree*). The current study provided further evidence for the good internal consistency of the PSPS-Jr. (e.g., Hewitt & al., 2011), with high internal consistency for the total score at both Time 1 ($\omega = .95$) and Time 2 ($\omega = .94$). Also, the test-retest correlation between Time 1 and Time 2 perfectionistic self-presentation was strong ($r = .69$).

Perfectionistic Concerns

We used four subscales from the *Big Three Perfectionism Scale* (BTPS: Smith et al., 2016) to measure perfectionistic concerns, in line with the self-critical perfectionism higher-order factor: Concern over mistakes (5-items; e.g., “When I make a mistake, I feel like a failure”), doubts about actions (5-items; e.g., “I have doubts about most of my actions”), self-criticism (4-items; e.g., “I judge myself harshly when I don’t do something perfectly”), and socially prescribed perfectionism (4-items; e.g., “People expect too much from me”). We used contextualized instruction in which participants referred to their experience as graduate students, and they rated each item on a 7-point Likert scale ranging from 1 (*not at all agree*) to 7 (*totally agree*). The internal consistency of the total score, combining the four subscales, has been proven to be high ($\alpha = .95$). In this sample, the internal consistency was excellent at both Time 1 ($\omega = .95$) and Time 2 ($\omega = .95$), with a strong test-retest correlation between Time 1 and 2 ($r = .79$).

Experience of Impostor Feelings

The experience of impostor feelings was measured using nine items adapted from the original Leary Impostor Scale (LIS: Leary et al., 2000; e.g., “I felt like my successes were due to some kind of luck”) and from Canning and colleagues (2020) (e.g., “I felt like an impostor”). Specifically, the items were adapted to remove the contextual elements from the wording (e.g., in class, today, sometimes), because participants were asked to reflect on a specific time frame (e.g., fall semester). Graduate students were asked to identify their level of agreement using a 7-point Likert scale ranging from 1 (*not at all agree*) to 7 (*totally agree*). At Time 1, participants referred to their experience since the start of their graduate program. At Time 2, they referred to their experience during the fall semester. Internal consistency was excellent at Time 1 ($\omega = .97$) and Time 2 ($\omega = .97$). The test-retest correlation between the experience of impostor feelings at Time 1 and 2 was high ($r = .83$).

Data Analyses

All analyses were performed using MPlus 8.7 (Muthén & Muthén, 2022) with the full information maximum likelihood robust estimator. For all analyses, composite scores were calculated for perfectionism, excellencism, perfectionistic concerns, perfectionistic self-presentation, and impostor feelings. We performed a path analysis with composite scores because we wanted to assess all the relationships between the variables (i.e., a saturated model) rather than impose a structure of fixed (null) and freely estimated paths on our data. This type of saturated model was deemed more aligned with the idea that the effects of excellencism should be examined after controlling for perfectionism and vice versa (Gaudreau et al., 2023).

Three models were tested to investigate the role of perfectionistic self-presentation and perfectionistic concerns as signature expressions in the associations of perfectionism and excellencism with the experience of impostor feelings. The two signature expressions of perfectionism were tested in separate models rather than combined into a single score. This was deemed appropriate to assess their respective role in the network of associations between perfectionism and impostor feelings. *Model 1* examined the contemporaneous associations at each time point. Unidirectional paths are estimated between the variables within each time point (e.g., Time 1 perfectionism → T1 perfectionistic concerns → T1 impostor feelings). Associations across time points are estimated using bivariate correlations (e.g., Time 1 perfectionism with Time 2 impostor feelings). This produces a fully saturated model (i.e., zero degrees of freedom) in which the focus remains on the cross-sectional unidirectional paths within each time point (e.g., Chamandy & Gaudreau, 2022). Even if the cross-sectional, this model is interesting because it assesses the associations at both Time 1 and Time 2, providing an initial overview of the consistency of the model across time points. *Model 2* examined the prospective/longitudinal

associations of excellencism and perfectionism at Time 1 with signature expressions of perfectionism and impostor feelings at Time 2. This semi-longitudinal model strengthened our inferences about the directionality of the associations of excellencism and perfectionism. *Model 3* examined the proposed impostor cycle (Clance, 1985) in which impostor feeling at Time 1 was associated with signature expressions of perfectionism at Time 2, which were associated with changes in impostor feelings between Time 2 and Time 1. This model offered a more stringent test of our hypothesis because it controlled for the baseline level when predicting impostor feelings at Time 2. In all models, we examined the direct effects of excellencism and perfectionism on impostor feelings, but our interpretation focused on the positive indirect effect of perfectionism (Gaudreau, 2021). Indirect effects were calculated with 5,000 bias-corrected bootstrapped 95% confidence intervals (Preacher & Hayes, 2008).

Results

Preliminary Analyses

Ahead of conducting the analysis, we assessed the data for potential univariate outliers, using the Z-score technique by obtaining the Z_i (i.e., standardized scores of a measure) to identify those with the data points that were $Z_i \geq 3$ or $Z_i \leq -3$ (Anusha et al., 2019; Chikodili et al., 2021). Additionally, potential multivariate outliers were assessed using the Mahalanobis distance with a significance threshold $p \leq 0.001$ to identify the data points that were marked as multivariate outliers (Mullen et al., 1995). A total of two outliers were identified and excluded from further analyses, resulting in a final sample of 393 participants at Time 1 and 256 participants at Time 2.

Table 1 presents the descriptive statistics, including means, standard deviations, bivariate correlations between variables, and test-retest correlation across the Time 1 and Time 2 scores. In line with the MEP framework (Gaudreau, 2019; 2021; Gaudreau et al., 2023), mean scores of

excellencism were higher than those of perfectionism at all times points. As expected, perfectionism and excellencism were positively correlated, and perfectionism correlated with perfectionistic concerns and self-presentation.

Main Analyses

Model 1. Contemporaneous Associations at Each Time Point

Distinct analyses were performed for perfectionistic self-presentation and perfectionistic concerns at each time point. Four models were performed to test our hypothesis.

At both Time 1 and Time 2, perfectionism was positively and significantly associated with perfectionistic self-presentation, which in turn was positively associated with impostor feelings (see Figure 2). Excellencism was not significantly associated with perfectionistic self-presentation either at Time 1 or Time 2. Consistent with our hypothesis, the indirect effect of perfectionistic self-presentation in the association between perfectionism and impostor feelings was positive and statistically significant at both Time 1 (see Model 1a in Table 2) and Time 2 (see Model 1b in Table 2).

At both Time 1 and Time 2, perfectionism was positively and significantly associated with perfectionistic concerns, which in turn was positively associated with impostor feelings (see Figure 2). Excellencism was negatively and significantly associated with perfectionistic concerns but only at Time 1. Consistent with our hypothesis, the indirect effect of perfectionistic concerns in the association between perfectionism and impostor feelings was positive and statistically significant at both Time 1 (see Model 1c in Table 2) and Time 2 (see Model 1d in Table 2).

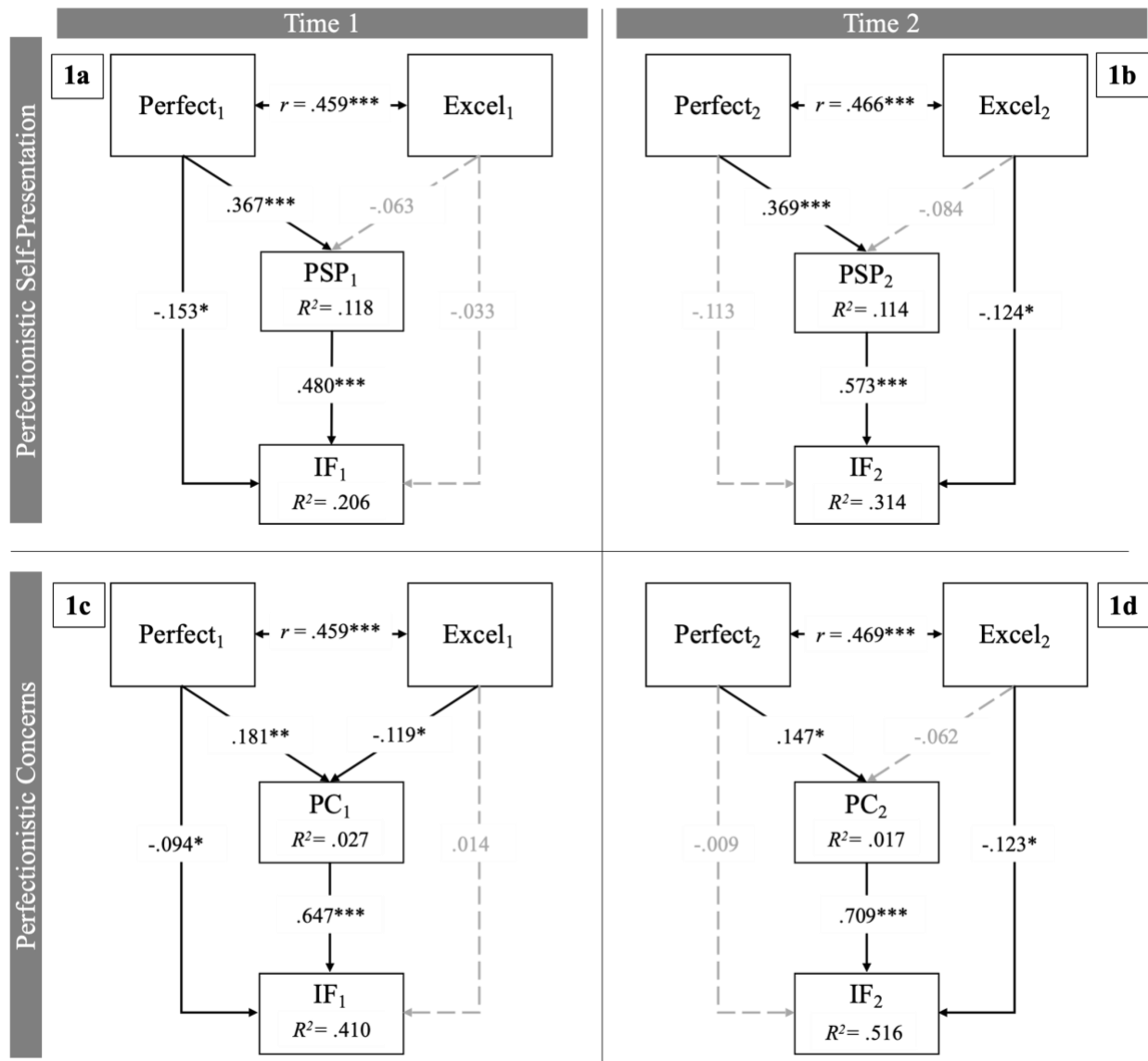
Table 3.1*Descriptive Statistics and Bivariate Correlations Between Variables at Time 1 and Time 2*

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Time 1												
1. Excellencism	5.44	0.92	(.95)									
2. Perfectionism	3.51	1.54	.46**	(.97)								
3. Impostor feelings	3.60	1.71	-.05	-.01	(.97)							
4. Perfectionistic concerns	2.95	0.89	-.04	.13**	.63**	(.95)						
5. Perfectionistic self-presentation	3.37	1.26	.11*	.34**	.43**	.56**	(.95)					
Time 2												
6. Excellencism	5.43	0.91	.71**	.40**	-.10	-.01	.03	(.95)				
7. Perfectionism	3.48	1.60	.31**	.74**	-.03	.10*	.22**	.47**	(.98)			
8. Imposter feelings	3.37	1.60	-.10	.01	.83**	.62**	.40**	-.12*	.02	(.97)		
9. Perfectionistic concerns	2.92	0.85	-.01	.12*	.64**	.79**	.47**	.01	.12	.71**	(.95)	
10. Perfectionistic self-presentation	3.44	1.14	.09	.34**	.43**	.57**	.69**	.09	.33**	.53**	.62**	(.94)

Note. Omega internal consistency coefficient presented on the diagonal. ** $p < .01$ * $p < .05$.

Figure 3.2

Model 1, Cross-Sectional Analysis of Longitudinal Data of the Mediating Effect of the Signature Expressions of Perfectionism



Note. Model 1. PSP = Perfectionistic Self-Presentation, IF = impostor feelings, PC =

Perfectionistic Concerns. Solid lines represent significant effects and dotted line represent non-significant effects. *** $p < .001$ ** $p < .005$ * $p < .05$.

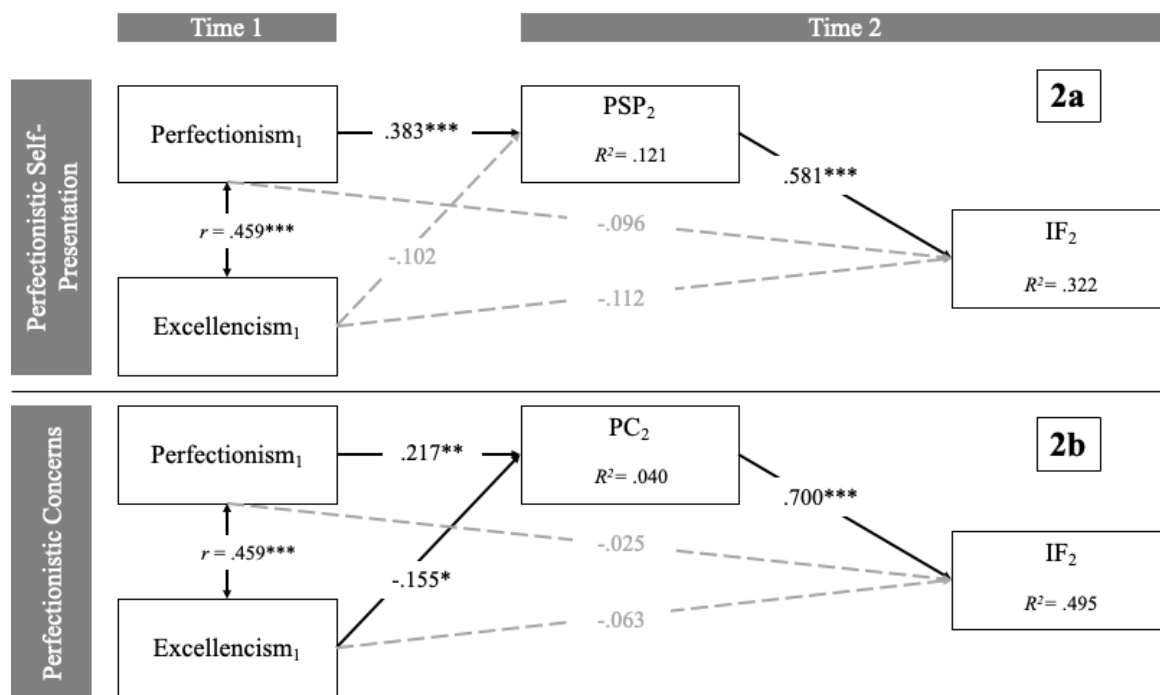
Model 2. Prospective Associations of Excellencism and Perfectionism

Distinct analyses were performed for perfectionistic self-presentation and perfectionistic concerns. Two models were performed to test our hypothesis.

Time 1 perfectionism was positively and significantly associated with Time 2 perfectionistic self-presentation, which in turn was positively associated with Time 2 impostor feelings (see Figure 3). Time 1 excellencism was not significantly associated with Time 2 perfectionistic self-presentation. Consistent with our hypothesis, the indirect effect of Time 2 perfectionistic self-presentation in the association between Time 1 perfectionism and Time 2 impostor feelings was positive and statistically significant (see Model 2a in Table 2).

Figure 3.3

Model 2, Prospective Mediation Model: Influence of Perfectionism and Excellencism at Time 1 on the Signature Expressions of Perfectionism and Impostor Feelings at Time 2



Note. Model 2. PSP = Perfectionistic Self-Presentation, IF = impostor feelings, PC = Perfectionistic Concerns. Significant standardized coefficients are presented. Solid lines represent significant effects, and dotted line represent non-significant effects. *** $p < .001$ ** $p < .005$ * $p < .05$.

Time 1 perfectionism was positively and significantly associated with Time 2 perfectionistic concerns, which in turn was positively associated with Time 2 impostor feelings (see Figure 3). Time 1 excellencism was negatively and significantly associated with Time 2 perfectionistic concerns. Consistent with our hypothesis, the indirect effect of Time 2 perfectionistic concerns in the association between Time 1 perfectionism and Time 2 impostor feelings was positive and statistically significant (see Model 2b in Table 2).

Model 3. Impostor Cycles of Changes in Impostor Feelings

Distinct analyses were performed for perfectionistic self-presentation and perfectionistic concerns. Two models were performed to test our hypothesis.

Time 1 impostor feeling was positively and significantly associated with Time 2 impostor feelings. Time 1 perfectionism and impostor feelings were positively and significantly associated with Time 2 perfectionistic self-presentation, which in turn was positively associated with changes in impostor feelings (see Figure 4). Time 1 excellencism was not significantly associated with Time 2 perfectionistic self-presentation. Consistent with our hypothesis, the indirect effects of Time 2 perfectionistic self-presentation in the associations of Time 1 perfectionism and Time 1 impostor feelings with changes in impostor feelings were positive and statistically significant (see Model 3a in Table 2). These findings supported a recursive impostor cycle in which impostor feelings influence perfectionistic self-presentation while also being influenced by it.

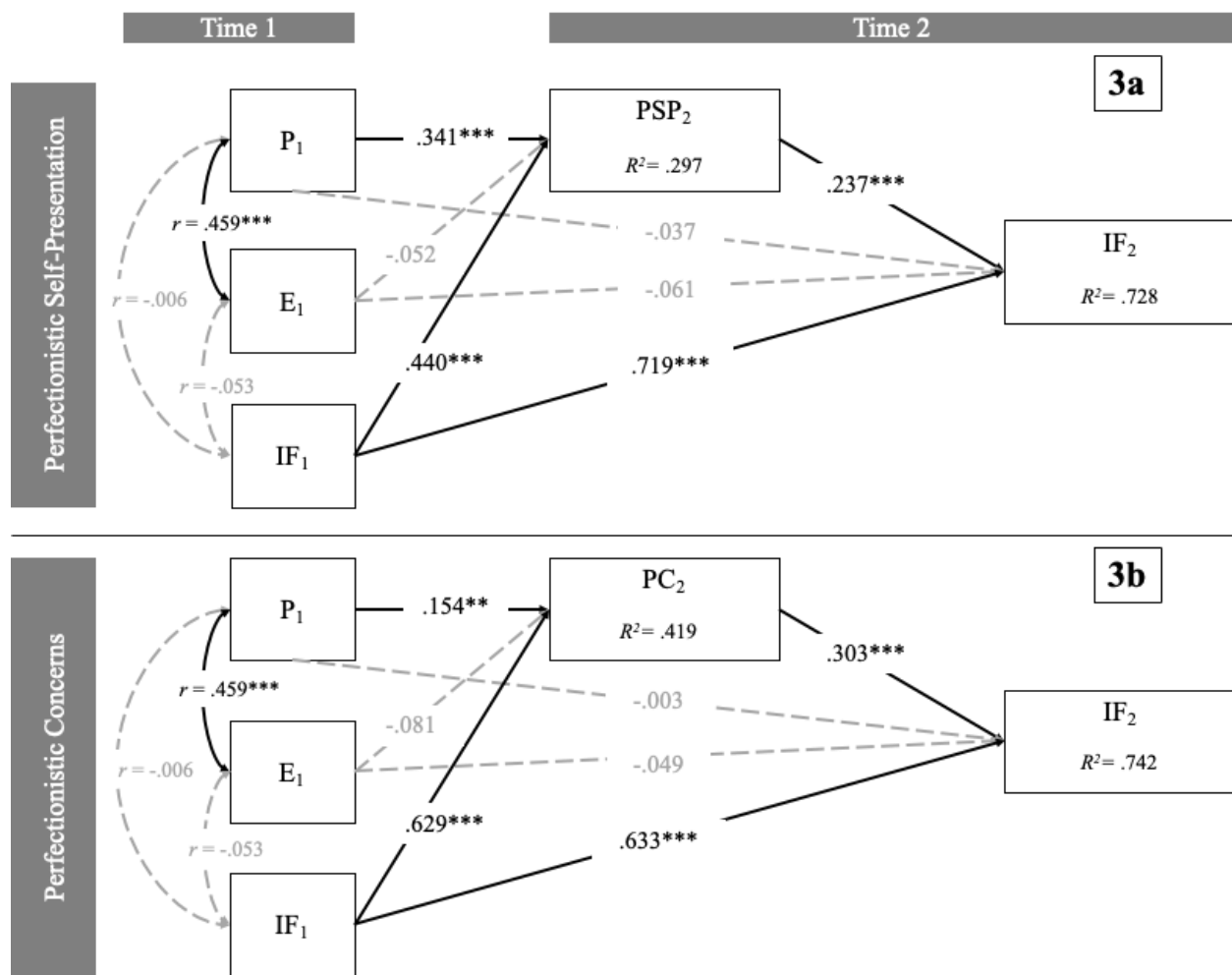
Table 3.2*Unstandardized Indirect Effects of Signature Expressions of Perfectionism*

Effects	<i>B</i>	95% <i>CI</i>
Model 1a		
T1 perfectionism → T1 PSP → T1 impostor feelings	0.195	[0.127, 0.272]
T1 excellencism → T1 PSP → T1 impostor feelings	-0.056	[-0.155, 0.033]
Model 1b		
T2 perfectionism → T2 PSP → T2 impostor feelings	0.213	[0.133, 0.297]
T2 excellencism → T2 PSP → T2 impostor feelings	-0.085	[-0.204, 0.035]
Model 1c		
T1 perfectionism → T1 PC → T1 impostor feelings	0.130	[0.045, 0.215]
T1 excellencism → T1 PC → T1 impostor feelings	-0.144	[-0.280, -0.001]
Model 1d		
T2 perfectionism → T2 PC → T2 impostor feelings	0.106	[0.010, 0.204]
T2 excellencism → T2 PC → T2 impostor feelings	-0.078	[-0.226, 0.083]
Model 2a		
T1 perfectionism → T2 PSP → T2 impostor feelings	0.223	[0.144, 0.307]
T1 excellencism → T2 PSP → T2 impostor feelings	-0.060	[-0.140, 0.014]
Model 2b		
T1 perfectionism → T2 PC → T2 impostor feelings	0.156	[0.058, 0.257]
T1 excellencism → T2 PC → T2 impostor feelings	-0.187	[-0.375, -0.001]
Model 3a		
T1 perfectionism → T2 PSP → change impostor feelings	0.085	[0.050, 0.133]
T1 excellencism → T2 PSP → change impostor feelings	-0.022	[-0.074, 0.021]
T1 impostor feelings → T2 PSP → change impostor feelings	0.099	[0.062, 0.149]
Model 3b		
T1 perfectionism → T2 PC → change impostor feelings	0.049	[0.014, 0.092]
T1 excellencism → T2 PC → change impostor feelings	-0.043	[-0.117, 0.019]
T1 impostor feelings → T2 PC → change impostor feelings	0.180	[0.130, 0.240]

Note. $N = 393$. T1 = Time 1. T2 = Time 2. PSP = Perfectionistic self-presentation. PC = Perfectionistic concerns. Indirect effects are estimated with 95% confidence intervals from 5,000 biased-corrected bootstraps.

Figure 3.4

Model 3, Prospective Mediation Model: Recursive Relationship of Impostor Feelings at Time 1 on the Signature Expressions of Perfectionism and Impostor Feelings at Time 2



Note. Model 3. P = Perfectionism, E = Excellencism, SP = Perfectionistic Self-Presentation, IF = Impostor Feelings, PC = Perfectionistic Concerns. Significant standardized coefficients are

presented. Solid lines represent significant effects, and dotted line represent non-significant effects. *** $p < .001$ ** $p < .005$ * $p < .05$

Time 1 impostor feeling was positively and significantly associated with Time 2 impostor feeling. Time 1 perfectionism and impostor feelings were positively and significantly associated with Time 2 perfectionistic concerns, which in turn was positively associated with changes in impostor feelings (see Figure 4). Time 1 excellencism was not significantly associated with Time 2 perfectionistic concerns. Consistent with our hypothesis, the indirect effects of Time 2 perfectionistic self-presentation in the associations of Time 1 perfectionism and Time 1 impostor feelings with changes in impostor feelings were positive and statistically significant (see Model 3b in Table 2). These findings supported an impostor cycle in which impostor feelings influence perfectionistic concerns while also being influenced by it.

Discussion

The MEP posits that perfectionistic standards and signature expressions of perfectionism play different yet complementary roles in psychological adjustment (Gaudreau, 2021). In this study, we examined the role of perfectionistic self-presentation and perfectionistic concerns in the indirect association between perfectionistic standards and the experience of impostor feelings of graduate students. As expected, perfectionistic standards (but not excellencism) were linked to signature expressions of perfectionism. Furthermore, both signature expressions of perfectionism explained how perfectionistic standards were indirectly and positively linked with impostor feelings. Overall, our results provided initial support for the idea that perfection strivers are at a greater risk of experiencing impostor feelings due to their higher likelihood of masking imperfections to their research supervisor and experiencing perfectionistic concerns in relation to their graduate studies.

Signature Expressions of Perfectionism

Three sets of findings about the signature expressions of perfectionism are worthy of further discussion. First, perfectionistic standards rather than excellencism were positively and significantly associated with perfectionistic self-presentation and concerns. This finding supports the importance of distinguishing between perfectionism and excellencism, marking a pivotal contribution of the MEP (Gaudreau, 2019). Once reinterpreted using the MEP guidelines (e.g., Gaudreau et al., 2024), these findings indicated that perfection strivers were more likely to experience doubts about actions, concerns over mistakes, social pressure to be perfect, and self-critical thinking than excellence strivers. These results replicated those previously observed in undergraduate students (Gaudreau et al., 2022), adolescents (Bien et al., 2024; Tape et al., 2024) and individuals performing creative tasks (Goulet-Pelletier et al., 2025). Additionally, perfection strivers were more preoccupied with the need to appear perfect and conceal their imperfections from their research supervisor than excellence strivers. These results regarding perfectionistic self-presentation replicated those of a recent study with undergraduate students (Pétrin-Pomerleau et al., 2025). However, the current study was the first one to simultaneously measure perfectionistic concerns and self-presentation. Across our cross-sectional and prospective models, perfectionistic standards were more strongly associated with perfectionistic self-presentation ($\beta = .37$) than with perfectionistic concerns ($\beta = .18$). These findings, although unexpected, provided initial evidence for the need to consider social-behavioural expressions of perfectionism among graduate students.

Second, our results indicated that perfectionistic standards played a significant indirect role in the experience of impostor feelings, through the enactment of signature expressions of perfectionism, such as perfectionistic concerns and self-presentation. Specifically, the findings

revealed that the link between perfectionistic standards and impostor feelings was better understood by considering how these standards contribute to the enactment of signature expressions of perfectionism, which in turn are more proximally tied to psychological maladjustment (Osenk et al., 2020; Benoit et al., 2025). This pattern was consistently observed across both contemporaneous (Model 1) and longitudinal models (Model 2 and 3). This study represents, to our knowledge, one of the first empirical tests of the sequential pathway proposed by the MEP (Gaudreau et al., 2023) as perfectionistic standards are likely to activate a constellation of psychological features (e.g., heightened concerns over mistakes, efforts to conceal imperfections) that fuel maladaptive experiences such as impostor feelings. Additionally, our findings further complement those of Cowie and colleagues (2018), as the inclusion of perfectionistic self-presentation and perfectionistic concerns was instrumental in better understanding the complex association between perfectionism and the experience of impostor feelings at the interpersonal level. Taken together, these findings reinforce the idea that it is not merely the endorsement of high personal standards that predicts impostor feelings, but rather how these standards are internalized and expressed.

Third, we found empirical evidence for the idea of a bidirectional association between perfectionism and impostor feelings, alluded to in the impostor cycle (Clance & Lawry, 2024; Clance, 1985; Sakulku & Alexander, 2011). Graduate students who felt like impostors since the start of their program were more likely to experience perfectionistic concerns and to rely on perfectionistic self-presentation tactics during the subsequent semester, which in turn reinforced their experience of impostor feelings at the end of their semester. Our findings support the notion that the experience of impostor feelings is a contextualized experience (Clance & Lawry, 2024). Moreover, Gullifor and colleagues (2023) proposed that the experience of impostor feelings can

be studied at a state-like level, where an individual would experience its pervasive effects when various putative mechanisms are enacted. With time, these mechanisms fuel what is known as the impostor cycle (Clance, 1985; Clance & Lawry, 2024). The context for graduate students can be highly ambiguous (Gardner, 2007) and demanding, particularly in terms of the pressure surrounding the need to publish, which can be highly detrimental to their self-concept (Bothello & Roulet, 2019). As such, many graduate students can experience impostor feelings, which fuel and are fuelled by the tendency of perfection strivers to experience perfectionistic concerns and mask their imperfections from others. Overall, our longitudinal findings supported the notion of an impostor cycle in which impostor feelings and perfectionism can feed of each other.

Limitations and Future Directions

Before further discussing the implications of our findings, we would like to acknowledge the presence of key limitations in our study. Firstly, although we studied graduate students, our analyses were not designed to compare the experience of impostor feelings across the type of graduate program (e.g., Master, Ph.D., or other) in which our participants were enrolled at the time of the study. Master's and doctoral students may experience different academic pressures, expectations, and self-evaluation processes, which could influence their experiences of impostor feelings and perfectionistic tendencies. However, there has been mixed evidence suggesting that the experience of impostor feelings does not significantly differ between doctoral and master's students (Cohen & McConnell, 2019; Tigranyan & al., 2020). Moreover, we recruited a diverse group of graduate students from a range of countries and academic disciplines, thereby promoting broader generalizability and minimizing potential biases associated with a homogeneous sample. Nonetheless, our different models would need to be replicated to examine invariance across disciplines and different graduate programs.

Second, our study relied on a short-term, prospective, longitudinal design, which may have influenced some of our findings. The test-retest stability of impostor feelings and signature expressions of perfectionism was high, which could be attributable to the short delay between the two-time points. It could also explain why the associations between the variables were similar across Time 1 and Time 2. However, it is essential to note that our findings were consistent when examining both contemporaneous (i.e., cross-sectional) and longitudinal associations between the variables. The signature expressions of perfectionism significantly predicted short-term changes in impostor feelings. Although our study revealed a reciprocal association between perfectionism and impostor feelings, future research should investigate these associations within a full longitudinal model (e.g., cross-lagged models) spanning multiple time points over a longer period.

Practical Implications

Notwithstanding these limitations, our study has three important implications for the academic community and scholars. First, as graduate students progress through their professional development, being able to recognize when good is good enough could help minimize the extent to which they experience impostor feelings. We found that excellencism was healthier than perfectionism, as it was negatively linked to perfectionistic concerns. Second, as stated by Pervez and colleagues (2021), many of the challenges faced by graduate students are outside of their control. As such, supervisors and faculty members should focus on fostering environments that deemphasize the highly competitive and meritocratic aspect of academia (Curran & Hill, 2019), by acknowledging honest, authentic good work, and also addresses academic struggles rarely discussed (e.g., burnout, repeated rejection) (Jaremka et al., 2020). Doing so could minimize the risk that perfectionistic students hide their imperfections from their research supervisor.

Minimizing perfectionistic self-presentation through open, honest, and caring relationships with graduate students could help research supervisors mitigate the likelihood that their students feel like impostors. Finally, scholars should further investigate the effectiveness of intervention programs that would target and reduce the enactment of signature expressions of perfectionism (e.g., Wade et al., 2019). Considering their key role in the indirect relationship between perfectionistic standards and the experience of impostor feelings, targeting the signature expressions could reduce the undesirable effects of perfectionism, without impacting the desirability of excellencism.

Conclusion

Our study addressed critical gaps in the literature on the experience of impostor feelings in relation to perfectionism and its manifestations. This study was the first to test the unique contribution of signature expressions of perfectionism on the relationship between perfectionistic standards and the experience of impostor feelings among graduate students. We found that the pursuit of perfectionism goes beyond excellencism, with perfectionistic standards indirectly increasing the risk of experiencing impostor feelings among graduate students. This positive indirect effect was found to be unique to perfectionistic standards (and not excellencism) and operated through perfectionistic self-presentation and perfectionistic concerns. This perspective also aligns with the suggestion by Gullifor and colleagues (2023) that existing models may not full capture the complexity of the relationships between impostor feelings and their proposed antecedents or outcomes. By following the theoretical underpinning of the MEP (Gaudreau, 2019, 2021; Gaudreau et al., 2023), our study offered a more precise understanding of the intricate antecedental role of perfectionistic standards in the experience of impostor feelings, while contributing to further our understanding of the psychological adjustment of students in

graduate studies (Benoit et al., 2025). Overall, the distinction between perfectionism and excellencism, as well as the differentiation between the core definitional feature and signature expressions of perfectionism is essential, as it allows for a more precise theoretical explanation of how and when perfectionism leads to unhealthy outcomes such as the experience of impostor feelings.

References

- Anusha, P. V., Anuradha, C., Chandra Murty, P. S. R., & Kiran, C. S. (2019). Detecting outliers in high dimensional data sets using Z-score methodology. *International Journal of Innovative Technology and Exploring Engineering*, 9(1), 48–53.
<https://doi.org/10.35940/ijitee.A3910.119119>
- Benoit, A., Andrade, G., & Gaudreau, P. (2025). Distinguishing perfectionism from excellencism: Their differential associations with graduate students' impostor feelings and the moderating role of research productivity. *OSF*.
- Bien, K., Wagner, J., & Brandt, N. D. (2024). Who tends to be a perfectionistic adolescent? Distinguishing perfectionism from excellencism and investigating the links with the Big Five and self-esteem. *British Journal of Psychology*. <https://doi.org/10.1111/bjop.12739>
- Bothello, J., & Roulet, T. J. (2019). The imposter syndrome, or the mis-representation of self in academic life. *Journal of Management Studies*, 56(4), 854–861.
<https://doi.org/10.1111/joms.12344>
- Bravata, D. M., Watts, S. A., Keefer, A. L., Madhusudhan, D. K., Taylor, K. T., Clark, D. M., Nelson, R. S., Cokley, K. O., & Hagg, H. K. (2019). Prevalence, predictors, and treatment of impostor syndrome: a systematic review. *Journal of General Internal Medicine*, 35(4), 1252–1275. <https://doi.org/10.1007/s11606-019-05364-1>
- Brennan-Wydra, E., Chung, H. W., Angoff, N., ChenFeng, J., Phillips, A., Schreiber, J., Young, C., & Wilkins, K. (2021). Maladaptive perfectionism, impostor phenomenon, and suicidal ideation among medical students. *Academic Psychiatry*, 45(6), 708–715.
<https://doi.org/10.1007/s40596-021-01503-1>

- Canning, E. A., LaCosse, J., Kroeper, K. M., & Murphy, M. C. (2020). Feeling like an imposter: The effect of perceived classroom competition on the daily psychological experiences of first-generation college students. *Social Psychological and Personality Science*, 11(5), 647–657. <https://doi.org/10.1177/1948550619882032>
- Chamandy, M., & Gaudreau, P. (2022). The pursuit of academic and career goals: A dual-domain latent change score model of coping, progress, and burnout. *International Journal of Stress Management*, 29(2), 130–142. <https://doi.org/10.1037/str0000247.supp>
- Chikodili, N. B., Abdulmalik, M. D., Abisoye, O. A., & Bashir, S. A. (2021). Outlier detection in multivariate time series data using a fusion of K-Medoid, Standardized Euclidean Distance and Z-Score. *Communications in Computer and Information Science*, 1350, 259–271. https://doi.org/10.1007/978-3-030-69143-1_21
- Clance, P., & Lawry, S. (2024). Impostor phenomenon: Origins and treatment. In *The impostor phenomenon: Psychological research, theory, and interventions*. (pp. 17–43). American Psychological Association. <https://doi.org/10.1037/0000397-002>
- Clance, P. R. (1985). *The impostor phenomenon: Overcoming the fear that haunts your success*. Peachtree Pub Limited.
- Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241–247. <https://doi.org/10.1037/h0086006>
- Cohen, E. D., & McConnell, W. R. (2019). Fear of fraudulence: graduate school program environments and the impostor phenomenon. *Sociological Quarterly*, 60(3), 457–478. <https://doi.org/10.1080/00380253.2019.1580552>

- Cowie, M. E., Nealis, L. J., Sherry, S. B., Hewitt, P. L., & Flett, G. L. (2018). Perfectionism and academic difficulties in graduate students: Testing incremental prediction and gender moderation. *Personality and Individual Differences, 123*, 223–228.
<https://doi.org/10.1016/j.paid.2017.11.027>
- Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin, 145*(4), 410–429.
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*(5), 449–468. <https://doi.org/10.1007/BF01172967>
- Gardner, S. K. (2007). “I heard it through the grapevine”: Doctoral student socialization in chemistry and history. *Higher Education, 54*(5), 723–740. <https://doi.org/10.1007/s10734-006-9020-x>
- Gaudreau, P. (2019). On the distinction between personal standards perfectionism and excellencism: A theory elaboration and research agenda. *Perspectives on Psychological Science, 14*(2), 197–215. <https://doi.org/10.1177/1745691618797940>
- Gaudreau, P. (2021). Separating the core definitional feature and the signature expressions of dispositional perfectionism: Implications for theory, research, and practice. *Personality and Individual Differences, 181*(May), 110975. <https://doi.org/10.1016/j.paid.2021.110975>
- Gaudreau, P., & Benoit, A. (2025). Distinguishing perfectionism and excellencism in graduate students: Contrasting links with performance satisfaction, research self-efficacy, burnout and dropout intentions. *British Journal of Psychology*.
- Gaudreau, P., Schellenberg, B. J. I., Gareau, A., Kljajic, K., & Manoni-Millar, S. (2022). Because excellencism is more than good enough: On the need to distinguish the pursuit of excellence

from the pursuit of perfection. *Journal of Personality and Social Psychology*.

<https://doi.org/10.1037/pspp0000411>

Gaudreau, P., Schellenberg, B. J., & Quesnel, M. (2023). From theory to research:

Interpretational guidelines, statistical guidance, and a shiny app for the model of excellencism and perfectionism. *European Journal of Personality*.

<https://doi.org/10.1177/08902070231221478>

Gotwals, J. K., Stoeber, J., Dunn, J. G. H., & Stoll, O. (2012). Are perfectionistic strivings in sport adaptive? A systematic review of confirmatory, contradictory, and mixed evidence. In

Canadian Psychology (Vol. 53, Issue 4, pp. 263–279). <https://doi.org/10.1037/a0030288>

Goulet-Pelletier, J. C., Beaudin, M. F., & Cousineau, D. (2025). Investigating the negative link between perfectionism and emotional divergent thinking. *Discover Psychology*, 5(1).

<https://doi.org/10.1007/s44202-025-00330-x>

Gullifor, D. P., Gardner, W. L., Karam, E. P., Noghani, F., & Coglisier, C. C. (2023). The impostor phenomenon at work: A systematic evidence-based review, conceptual development, and agenda for future research. In *Journal of Organizational Behavior*. John Wiley and Sons Ltd. <https://doi.org/10.1002/job.2733>

Hewitt, P. L., Blasberg, J. S., Flett, G. L., Besser, A., Sherry, S. B., Caelian, C., Papsdorf, M., Cassels, T. G., & Birch, S. (2011). Perfectionistic Self-Presentation in children and adolescents: Development and validation of the Perfectionistic Self-Presentation Scale-Junior Form. *Psychological Assessment*, 23(1), 125–142. <https://doi.org/10.1037/a0021147>

Hewitt, P. L., Flett, G. L., Sherry, S. B., Habke, M., Parkin, M., Lam, R. W., McMurtry, B., Ediger, E., Fairlie, P., & Stein, M. B. (2003). The interpersonal expression of perfection:

- Perfectionistic self-presentation and psychological distress. *Journal of Personality and Social Psychology*, 84(6), 1303–1325. <https://doi.org/10.1037/0022-3514.84.6.1303>
- Hill, A. P., & Curran, T. (2015). Multidimensional perfectionism and burnout: A meta-analysis. *Personality and Social Psychology Review*, 20(3), 269–288. <https://doi.org/10.1177/1088868315596286>
- Hill, A. P., Mallinson-Howard, S. H., & Jowett, G. E. (2018). Multidimensional perfectionism in sport: A meta-analytical review. *Sport, Exercise, and Performance Psychology*, 7(3), 235–270. <https://doi.org/10.1037/spy0000125>
- Jaremka, L. M., Ackerman, J. M., Gawronski, B., Rule, N. O., Sweeny, K., Tropp, L. R., Metz, M. A., Molina, L., Ryan, W. S., & Vick, S. B. (2020). Common academic experiences no one talks about: Repeated rejection, impostor syndrome, and burnout. *Perspectives on Psychological Science*, 15(3), 519–543. <https://doi.org/10.1177/1745691619898848>
- Leary, M. R., Patton, K. M., Orlando, A. E., & Funk, W. W. (2000). The impostor phenomenon: Self-perceptions, reflected appraisals, and interpersonal strategies. *Journal of Personality*, 68(4), 725–756. <https://doi.org/10.1111/1467-6494.00114>
- Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2017). The relationship between perfectionism and psychopathology: A meta-analysis. *Journal of Clinical Psychology*, 73(10), 1301–1326. <https://doi.org/10.1002/jclp.22435>
- Mullen, M. R., Milne, G. R., & Doney, P. M. (1995). An international marketing application of outlier analysis for structural equations: A methodological note. *Journal of International Marketing*, 3(1), 45–62.
- Muthén, L. K., & Muthén, B. (2022). *Mplus (Version 8.7)*.

- Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, 32(10), 972–983. <https://doi.org/10.1037/pas0000942.supp>
- Pákozdy, C., Askew, J., Dyer, J., Gately, P., Martin, L., Mavor, K. I., & Brown, G. R. (2024). The imposter phenomenon and its relationship with self-efficacy, perfectionism and happiness in university students. *Current Psychology*, 43(6), 5153–5162. <https://doi.org/10.1007/s12144-023-04672-4>
- Pannhausen, S., Klug, K., & Rohrmann, S. (2020). Never good enough: The relation between the imposter phenomenon and multidimensional perfectionism. *Current Psychology*, 41(2), 888–901. <https://doi.org/10.1007/s12144-020-00613-7>
- Pervez, A., Brady, L. L., Mullane, K., Lo, K. D., Bennett, A. A., & Nelson, T. A. (2021). An empirical investigation of mental illness, imposter syndrome, and social support in management doctoral programs. *Journal of Management Education*, 45(1), 126–158. <https://doi.org/10.1177/1052562920953195>
- Pétrin-Pomerleau, P., Andrade, G., Verner-Filion, J., Schellenberg, B. J., & Gaudreau, P. (2025). Exploring social disconnection through the lens of the model of excellencism and perfectionism. *Journal of Social and Clinical Psychology*, 44(2), 149–183.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. <https://doi.org/10.3758/BRM.40.3.879>
- Sakulku, J., & Alexander, J. (2011). The Impostor Phenomenon. *The Journal of Behavioural Science*, 6(1), 75–97. <https://doi.org/https://doi.org/10.14456/ijbs.2011.6>

- Smith, M. M., Saklofske, D. H., Stoeber, J., & Sherry, S. B. (2016). The Big Three Perfectionism Scale: A new measure of perfectionism. *Journal of Psychoeducational Assessment*, 34(7), 670–687. <https://doi.org/10.1177/0734282916651539>
- Sonnak, C., & Towell, T. (2001). The impostor phenomenon in British university students: Relationships between self-esteem, mental health, parental rearing style and socioeconomic status. *Personality and Individual Differences*, 31(6), 863–874. [https://doi.org/10.1016/S0191-8869\(00\)00184-7](https://doi.org/10.1016/S0191-8869(00)00184-7)
- Stoeber, J., & Gaudreau, P. (2017). The advantages of partialling perfectionistic strivings and perfectionistic concerns: Critical issues and recommendations. In *Personality and Individual Differences* (Vol. 104, pp. 379–386). Elsevier Ltd. <https://doi.org/10.1016/j.paid.2016.08.039>
- Stoeber, J., Lalova, A. V., & Lumley, E. J. (2020). Perfectionism, (self-)compassion, and subjective well-being: A mediation model. *Personality and Individual Differences*, 154(July 2019), 109708. <https://doi.org/10.1016/j.paid.2019.109708>
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, 10(4), 295–319. https://doi.org/10.1207/s15327957pspr1004_2
- Tape, N., Dry, M., Monaghan, B., Tan, N., & Turnbull, D. (2024). The Scale of Perfectionism and Excellencism (SCOPE): an adolescent-based validation study for the measurement of perfectionism and excellencism. *Educational and Developmental Psychologist*, 41(1), 3–11. <https://doi.org/10.1080/20590776.2023.2289627>

- Thompson, T., Foreman, P., & Martin, F. (2000). Impostor fears and perfectionistic concern over mistakes. *Personality and Individual Differences*, 29(4), 629–647.
[https://doi.org/10.1016/S0191-8869\(99\)00218-4](https://doi.org/10.1016/S0191-8869(99)00218-4)
- Tigranyan, S., Byington, D. R., Liupakorn, D., Hicks, A., Lombardi, S., Mathis, M., & Rodolfa, E. (2020). Factors related to the impostor phenomenon in psychology doctoral students. *Training and Education in Professional Psychology*, 15(4), 298–305.
<https://doi.org/10.1037/tep0000321>
- Wade, T. D., Kay, E., de Valle, M. K., Egan, S. J., Andersson, G., Carlbring, P., & Shafran, R. (2019). Internet-based cognitive behaviour therapy for perfectionism: More is better but no need to be prescriptive. *Clinical Psychologist*, 23(3), 196–205.
<https://doi.org/10.1111/cp.12193>
- Wang, K. T., Sheveleva, M. S., & Permyakova, T. M. (2019). Imposter syndrome among Russian students: The link between perfectionism and psychological distress. *Personality and Individual Differences*, 143(January), 1–6. <https://doi.org/10.1016/j.paid.2019.02.005>
- With, S., Benoît, A., & Gaudreau, P. (2024). Self-compassion as a moderator in the relationships of excellencism and perfectionism with indicators of mental Health. *Mindfulness*, 15(7), 1650–1664. <https://doi.org/10.1007/s12671-024-02388-5>

CHAPTER 4

General Discussion

General Discussion

Graduate programs present a unique set of challenges that extend beyond mastering coursework and conducting research (Barry et al., 2018). Graduate students must navigate the pressures of meeting high academic standards, producing scientifically rigorous work, and maintaining a level of research productivity that aligns with institutional and program expectations (Devos et al., 2017). Meanwhile, many students set exceedingly high personal standards, often striving for idealized personal standards of perfection, which can foster significant worries and self-doubt (Ayres, 2022). Despite growing recognition of the impact of these challenges on university students (Curran & Hill, 2019), relatively little research has examined how the interplay between high achievement expectations and self-imposed standards influences psychological adjustment among graduate students. Specifically, on how these factors contribute to the experience of impostor feelings, which may undermine and thwart their full potential and confidence in their academic and professional pursuit.

The overarching goal of my thesis was to investigate the layered dynamics of the complex associations between perfectionism and impostor feelings among graduate students. My thesis examined two distinct research axes designed to test the two fundamental assumptions outlined in the MEP (Gaudreau, 2019; 2021; Gaudreau et al., 2024), which differentiate between perfectionism and excellencism. *Axis 1* focused on establishing how perfectionistic standards were associated with the experience of impostor feelings, and how this relationship varied depending on the graduate student's perceptions of scientific productivity and academic factors. *Axis 2* further prioritized how perfectionistic standards indirectly contributed to the experience of impostor feelings through their associations with signature expressions of perfectionism, such as perfectionistic concerns and perfectionistic self-presentation. Together, both axes offered a more

nuanced understanding of how the core definition of perfectionism (i.e., perfectionistic standards) manifests through distinct psychological and social processes that shaped the experience of impostor feelings among graduate students in academic contexts.

Summary of the Findings

Study 1 (Manuscript 1)

In the first study, we conducted a meta-analysis to clarify the complex relationship between perfectionism and the experience of impostor feelings by distinguishing between personal standards of perfection, excellence, and signature expressions of perfectionism, as proposed by the MEP. Overall, *Study 1* provided empirical support for the MEP framework, emphasizing that the pervasive experience of impostor feelings typically attributed to perfectionism is more accurately associated with the signature expressions of perfectionism (e.g., perfectionistic concerns) rather than the pursuit of high standards per se. The results revealed that signature expressions of perfection were more strongly correlated with the experience of impostor feelings than perfectionistic standards, which showed a weak positive correlation. In contrast, the high standards involved in excellencism were not significantly correlated with impostor feelings at all. These findings highlight the importance of distinguishing between perfectionistic standards and high personal standards, suggesting that the conflation of these constructs in previous research may have led to an overestimation of the relationship between perfectionism and impostor feelings. Instead, this relationship may be more accurately attributed to more proximal factors, such as the signature expression of perfectionism.

Study 2 (Manuscript 1)

In the second study, we investigated the relationship between perfectionism, excellencism, and the experience of impostor feelings among graduate students, by controlling

for contextual factors. Broadly, *Study 2* employed the SCOPE to distinguish between high personal standards (i.e., excellencism) and unattainable perfectionistic standards (i.e., perfectionism), examining how these constructs interacted with graduate students' satisfaction with their scientific productivity, to predict the extent to which they experience impostor feelings. The findings indicated that neither excellencism nor perfectionism were significantly associated with the experience of impostor feelings, suggesting that excellence strivers and perfection strivers experienced, on average, comparable levels of impostor feelings. However, satisfaction with research productivity moderated the relationship between perfectionism and impostor feelings. Specifically, perfection strivers experienced higher impostor feelings than excellence strivers when they were dissatisfied with their research productivity. Conversely, perfection strivers reported lower impostor feelings when they were more satisfied with their productivity. These findings underscore the context-dependent nature of perfectionism, highlighting that perfection strivers' experiences of impostor feelings are influenced by their perceived achievement and satisfaction with their productivity. In contrast, excellence strivers maintained consistent levels of impostor feelings, irrespective of their perceived productivity, suggesting that excellencism is associated with more stable self-worth.

Study 3 (Manuscript 1)

In the third study, we tried to replicate and extend the findings of *Study 2* by further exploring how annual research productivity and varying peer-review feedback scenarios moderated the relationship of perfectionism and excellencism with the experience of impostor feelings among graduate students. Consistent with *Study 2*, neither excellencism nor perfectionism was significantly associated with impostor feelings, suggesting that both perfection strivers and excellence strivers experienced a similar number of impostor feelings.

However, as expected, annual research productivity significantly moderated the relationship between perfectionism and impostor feelings. Specifically, perfection strivers experienced more impostor feelings when they reported lower annual research productivity compared to excellence strivers, whereas they reported a similar experience of impostor feelings when their annual research productivity was higher. Excellence strivers consistently experienced low impostor feelings regardless of their productivity levels. Additionally, the experience of impostor feelings varied across peer-review feedback scenarios, being highest in the negative feedback scenario and lowest in the positive feedback scenario. Excellence strivers exhibited the sharpest decline in impostor feelings when moving from negative to mixed feedback, suggesting greater psychological resilience in interpreting ambiguous feedback positively. These findings underscore the context-dependent and feedback-sensitive nature of perfectionism, emphasizing that perfection strivers' impostor feelings are highly contingent on external evaluations and perceived achievement, whereas excellence strivers maintain a more stable sense of self-worth across different evaluative contexts.

Study 4 (Manuscript 2)

In the fourth study, we sought to investigate the unique contribution of signature expressions of perfectionism as mediators in the association between perfectionistic standards and the experience of impostor feelings among graduate students. This study used a short-term longitudinal prospective design to draw more precise inferences about the direction of the associations of perfectionism and excellencism with impostor feelings. Across both cross-sectional and longitudinal analyses, our results showed that perfectionistic standards were indirectly associated with impostor feelings because they were positively associated with signature expressions of perfectionism (i.e., perfectionistic concerns and perfectionistic self-

presentation), which, in turn, were positively associated with impostor feelings. Consistent with the MEP hypotheses, our results showed that perfectionistic standards are unhealthy because their maladaptive effects are indirectly attributable to the fact that perfection strivers have elevated perfectionistic concerns and tendencies to mask and hide their imperfections from others. Moreover, a mutually reinforcing pattern was found in which impostor feelings predicted an increase in both perfectionistic concerns and self-presentation, which in turn, predicted an increase in impostor feelings. These findings are consistent with the idea of a cycle in which perfectionism and impostor feelings share a bidirectional pattern of associations. Overall, the results from *Study 4* provided empirical support for the idea that dispositional perfectionistic standards are indirectly associated with impostor feelings through the state enactment of signature expressions of perfectionism.

From Dual Axes to Central Insights: Contributions of the Thesis

Taken together, the findings from these studies offered a novel understanding of how the MEP framework (Gaudreau, 2019; 2021; Gaudreau et al., 2024) can be applied to differentiate between perfectionism and excellencism in relation to the experience of impostor feelings among graduate students. Moreover, the studies demonstrated that excellencism is not inherently associated with negative outcomes such as the experience of impostor feelings. In contrast, perfectionism is positively associated with impostor feelings, particularly when graduate students report lower levels of scientific productivity, and when perfectionism is expressed through signature expressions of perfection. Understanding these dynamics through the lens of the MEP advances theoretical perspectives on perfectionism and the experience of impostor feelings.

Axis I: Clarifying the associations between personal standards and impostor feelings

One of the most important theoretical contributions of this thesis is its role in clarifying the long-standing ambiguity surrounding the role of perfectionism in the experience of impostor feelings. Aligned with *Axis 1*, the findings from *Manuscript 1* supported and extended key distinctions outlined in the MEP (Gaudreau, 2019, 2021) by empirically reinforcing the theoretical separation between high personal standards (i.e., excellencism) and perfectionistic standards. Showing that only the latter was positively associated with the experience of impostor feelings among graduate students, particularly under conditions of perceived underperformance or negative evaluation.

Instrumentally, *Study 1* offered a comprehensive meta-analytical synthesis of the association between personal standards and the experience of impostor feelings making several important contributions to the theoretical and empirical foundation of this thesis. First, by confirming that not only high personal standards (i.e., excellencism) and perfectionistic standards represent distinct forms of striving, each showing a differentiated association with impostor feelings, the meta-analysis revealed that the signature expressions of perfectionism were the most consistently and strongly associated with the experience of impostor feelings. By demonstrating this robust association across a wide range of studies, the meta-analysis strengthens the argument that signature expressions of perfectionism, particularly cognitive expressions (e.g., concerns over mistakes, doubts about action), represent a central vulnerability factor in how graduate students experience impostor feelings. Corroborating prior findings linking perfectionistic concerns as stronger predictors of psychological maladjustment (e.g., Limburg et al., 2017 Smith et al., 2021). Second, the findings further clarified the role of perfectionistic standards by revealing that their association with impostor feelings is weaker and far less consistent. This distinction contributes meaningfully to refining current theoretical

debates about whether striving for high standards is inherently problematic (Vergauwe et al., 2015; Wang et al., 2019; Berry et al., 2021; Gullifor et al., 2023). The findings provide empirical support to the theoretical position advanced in the MEP (Gaudreau, 2019, 2021), which argues that it is not the setting of high personal standards in itself that is detrimental, but rather how these standards are experienced and expressed through evaluative and self-critical tendencies. Third, *Study 1* revealed critical knowledge gaps and highlighted several inconsistencies in the literature, and the meta-analysis provided a robust rationale for exploring the moderating role of academic factors such as research productivity and for more clearly outlining the conceptual boundary between perfectionism and excellencism. Therefore, *Study 1* played a foundational role in guiding the overall design of this doctoral research program and in informing the hypotheses tested in *Studies 2* and *3*.

Subsequently, *Study 2* from *Manuscript 1* made several contributions to the research objectives of Axis 1 by empirically testing how perfectionistic standards and excellencism are differently associated with impostor feelings among graduate students, while also accounting for whether perceived scientific productivity and academic factors moderate these relationships. *Study 2* provided initial evidence that perfectionistic standards, and not excellencism, were positively related to the experience of impostor feelings, thus reinforcing a central theoretical distinction proposed by the MEP (Gaudreau, 2019, 2021). Complementary to *Study 1*, this finding offered theoretical refinement by revealing that the pursuit of high personal standards is not inherently maladaptive unless it is accompanied by a marked evaluative rigidity and self-critical tendencies (e.g., having a perception of low scientific productivity). A novel contribution of *Study 2* was the introduction of the perception of scientific productivity as a moderating variable, which revealed that the relationship between perfectionistic standards and impostor

feelings was stronger among graduate students who viewed themselves as being less productive than their peers. However, when perfectionist striving graduate students perceived their levels of scientific productivity to be higher than their peers, they experienced fewer impostor feelings. Despite being highly academically successful, graduate students are often facing situations where their intellectual and academic prowess can be challenged by their peers (Carless et al., 2023). As expectations increase (Mulolli et al., 2022) and their perception of progress diminishes, they may begin to foster alarming self-doubts and feelings of not being good enough. In response, many may feel compelled to conceal their imperfection from their peers. Therefore, findings from *Study 2* added a contextual dimension to *Axis 1* by demonstrating that perfectionistic vulnerabilities are intensified when graduate students feel they are not meeting their academic expectations.

Furthermore, *Study 3* extended the findings from *Study 2* in a new sample of graduate students while enhancing the ecological validity through a simulated peer-reviewed scenario that reflected real academic feedback conditions. Specifically, the findings from *Study 3* confirmed that perfectionistic standards were most strongly and positively associated with the experience of impostor feelings in the context of low perception of annual research productivity, while not being associated with impostor feelings when they perceived their annual productivity² to be high. Therefore, as the perception of scientific productivity did not significantly moderate the relationship between perfectionism and impostor feelings, *Study 3* did not fully replicate the

²An important nuance is to be made between the perception of scientific productivity and the perception of annual research productivity. Although, positively correlated ($r=.252, p<.01$) annual research productivity was more objective in nature as graduate students were asked to report specific number of articles published (e.g., first author, coauthor) within the last year, while the perception of scientific productivity was more subjective self-reported assessment made on their overall experience since the start of their program.

results of the moderation from *Study 2*. However, similar patterns of effects were found when controlling for the perception of annual research productivity, which further reinforced the idea that perfectionistic vulnerabilities are exacerbated when graduate students believe they are not meeting their unrealistic academic expectations. Also, *Study 3* introduced three peer-reviewed feedback scenarios (i.e., positive feedback, mixed feedback, negative feedback). The findings revealed that perfection striving graduate students were less resilient to impostor feelings than excellence strivers in the mixed and positive feedback scenarios, while there was no difference in the negative scenario. This highlighted the psychological salience of evaluative contexts in shaping the experience of impostor feelings and documented that perfectionistic standards can become particularly distressing when triggered by external criticism or perceived failure. Additionally, the simulated feedback scenarios revealed that impostor feelings were not limited to a trait-like disposition, but also situationally responsive, which supports the idea that the experience of impostor feeling emerges from a dynamic interplay between personality dispositions and academic environments (Gullifor et al., 2023). *Study 3* bridged dispositional and conceptual elements emphasized in Axis 1, by offering a nuanced perspective on how feedback, perceived performance and internalized standards converge to shape the experience of impostor feelings among graduate students. Moreover, *Study 3* also laid conceptual groundwork for Axis 2 by pointing toward the signature expressions of perfectionism (e.g., perfectionistic concerns and perfectionistic self-presentation) as likely putative mechanisms explaining these effects.

Traditionally, impostor feelings have been predominantly operationalized as a more stable, trait-like experience, conceptualized as an enduring self-perception of fraudulence (Clance, 1985; Bravata et al., 2019), with few exceptions (Leary et al., 2000). However, *Study 2* and *Study 3* challenged this assumption by revealing that the experience of impostor feelings

should not be solely considered as being *dispositional*; rather this experience is more strongly influenced by *situational and contextual* antecedents. As such, supporting the notion that the experience of impostor feelings is far more contextually malleable (Cohen & McConnell, 2019) than it was previously theorized, because impostor feelings appear to be situational reactions to competence-relevant contexts, that are driven by perfectionistic tendencies.

Together, the results from *Manuscript 1* support the claim by Gullifor and colleagues (2023) that past findings regarding how the experience of impostor feelings is related to various concepts may have been inaccurately represented due to the use of lenient or inconsistent conceptualization of what the experience of impostor feelings entails. To that extent, the results presented in this thesis suggest that this inconsistency emanates from a failure to distinguish between excellencism from perfectionism. Additionally, it arises from a lack of attention to the separation between the core definition of perfectionistic strivings and the manifestation of the expressions that accompany perfectionism without defining them. However, implementing the framework proposed by the MEP (Gaudreau, 2019; 2021; Gaudreau et al., 2024) provides a more precise and robust theoretical model that examines when and why perfectionistic strivings are associated with the experience of impostor feelings, while the pursuit of excellence is not, thereby addressing prior ambiguities in the literature.

Axis II: Clarifying the psychological mechanisms linking perfectionistic standards, signature expressions of perfectionism and impostor feelings. An additional central theoretical contribution of this thesis lies in its advancement of a process-oriented understanding of the experience of impostor feelings. Aligned with *Axis 2*, the findings from *Manuscript 2* revealed how perfectionistic standards are enacted through signature expressions of perfectionism, such as perfectionistic concerns and perfectionistic self-presentation, which together indirectly shaped

the experience of impostor feelings among graduate students. Therefore, while personal standards set the stage, it is the situational enactment of signature expressions of perfectionism that perpetuates the experience of impostor feelings.

Study 4 made several important contributions by clarifying how perfectionistic standards are associated with the experience of impostor feelings through identifiable psychological mechanisms. First, *Study 4* provided longitudinal support to the MEP by demonstrating that perfectionistic standards do not directly predict impostor feelings; instead, their influence operates indirectly through signature expressions of perfectionism, such as perfectionistic concerns and perfectionistic self-presentation. This finding supports and advances the MEP by empirically confirming that the core definitional feature of perfectionism operates through its signature expressions, thereby offering a more precise explanation of how perfectionistic standards contribute to the experience of impostor feelings in academic settings. Second, *Study 4* helped distinguish perfectionism from excellencism by revealing that excellencism was not associated with either of the signature expressions of perfectionism nor with impostor feelings. This contribution is crucial because it reinforces the conceptual distinction between striving for excellence and striving for perfection and helps resolve the ongoing debates about whether perfectionism can be adaptive (Stoeber & Otto, 2006). Specifically, this finding suggests that the pursuit of high standards is not inherently harmful unless accompanied by critical self-evaluations and self-presentation strategies (Leary et al., 2000; Gaudreau, 2021). Third, by using a short longitudinal design, *Study 4* added methodological depth to this thesis by supporting the proposed temporal sequence between perfectionistic standards, their cognitive (i.e., perfectionistic concerns) and behavioural (i.e., perfectionistic self-presentation) expressions, and the experience of impostor feelings. This strengthens the argument that these psychological

expressions play a meaningful role over time, and it contributes to the empirical foundations of the MEP framework by supporting its assumptions with evidence collected across an entire academic semester. Taken together, these findings extend prior research by offering a more detailed and empirically robust understanding of how perfectionism contributes to the experience of impostor feelings among graduate students.

Signature Expressions of Perfectionism: Sustaining and the Impostor Cycle. Furthermore, the findings from *Manuscript 2* refine the theoretical premise behind the impostor cycle (Clance & Lawry, 2024; Clance, 1985) by empirically identifying key factors that sustain the experience of impostor feelings over time. The impostor cycle has been described as a self-reinforcing process, in which individuals doubt their abilities, engage in maladaptive behaviours, and inadvertently will experience more impostor feelings as a result (Clance, 1985; Clance & Lawry, 2024). However, there has been little empirical research that sought to examine how this cycle unfolds in real-world academic contexts. The longitudinal findings from *Manuscript 2* provide empirical evidence that the enactment of perfectionistic self-presentation and perfectionistic concerns contributes to the perpetuation of this cycle over a semester. More precisely, a mutually reinforcing pattern was found in which impostor feelings predicted an increase in both perfectionistic concerns and self-presentation, which in turn, predicted an increase in impostor feelings. This suggests that perfectionistic tendencies are not only associated with the experience of impostor feelings, but they actively sustain it through specific interpersonal and cognitive mechanisms. These results highlight the enactment of signature expressions of perfectionism as a key mechanism through which the indirect effects of perfectionism are sustained and reinforced. This insight offers supplemental support to existing theoretical models by revealing that the experience of impostor feelings is not just a reaction to external pressures, but it is shaped by

self-imposed socio-behavioural and cognitive processes that unfold over time. This contribution helps shift the perspective from a trait-like view to a dynamic state-like process in which individuals unwittingly perpetuate their own experience of impostor feelings through perfectionistic concerns and self-presentation.

Collectively, these theoretical contributions confirm and extend the MEP by revealing that impostor feelings are shaped not just by perfectionism, but how perfectionism is expressed through perfectionistic concerns and perfectionistic self-presentation. Aligned with the theoretical premises put forward by Gullifor and colleagues (2023) regarding the state enactment of impostor feelings, this understanding helps clarify when and why graduate students may experience impostor feelings to a varying degree over time.

What About Graduate Students

Graduate students are at the core of this thesis, serving as the primary population through which the relationship between personal standards of perfection, personal standards of excellence, and their experience of impostor feeling is examined. Across *Manuscript 1* and *Manuscript 2*, graduate students emerge as high-achieving and motivated but self-critical individuals, whose academic ambitions are often entangled with perfectionistic standards and perfectionistic concerns or self-presentation. While their drive to pursue high standards (i.e., excellence striving) can be constructive, it becomes psychologically taxing when their strivings are tied with unrealistic and rigid self-imposed personal standards (i.e., perfection striving) and impostor feelings.

Manuscript 1 demonstrated that the convoluted association between perfectionism and the experience of impostor feelings is contingent on research productivity. Suggesting that graduate students' sense of academic satisfaction is deeply tied to external markers of success,

such as the number of publications, the number of conference presentations, and the feedback received on their work. These findings highlight how the evaluation of academic performance and self-imposed unattainable personal standards uniquely contribute to the experience of impostor feelings among graduate students.

Also, *Manuscript 2* provided longitudinal evidence that the experience of impostor feelings of graduate students is reinforced over time through socio-behavioural and cognitive mechanisms. Specifically, perfectionistic self-presentation and perfectionistic concerns emerged as key antecedents that sustain the experience of impostor feelings. Therefore, this is indicative that graduate students who feel compelled to appear flawless, and harshly judge their own academic abilities, are more likely to experience persistent impostor feelings. This finding underscores that the experience of impostor feelings is not a static trait, but rather a contextually reinforced phenomenon, deeply embedded in the academic culture. The identification of these putative mechanisms provides actionable insights for interventions that target the experience of impostor feelings among graduate students, such as academic environments that promote healthy excellence-focused goal setting rather than rigid perfectionistic expectations.

The centrality of graduate students in this thesis also extends to its practical implications, as the findings emphasize the importance of supporting graduate students not only academically, but also through interventions targeting perfectionistic expressions, the feedback culture (Jaremka et al., 2020), and self-compassion (With et al., 2024). Academic institutions, supervisors, and mentoring programs must recognize and address the pressures that exacerbate the experience of impostor feeling, such as the hyper competitiveness (Horta & Li, 2023), unclear expectations (Fisher et al., 2019), and a culture that rewards prestige above all else (Curran & Hill, 2019). Encouraging excellencism over perfectionism, fostering open discussions

about academic struggles (e.g., Jaremka et al., 2020), and providing structured, constructive feedback can help mitigate the psychological burdens that many graduate students face as they navigate through their experience of feeling inadequate or a fraud.

Given the social and performance-related antecedents to the experience of impostor feelings observed across *Studies 2* through *4*, it is imperative for graduate training environments to consider how institutional practices can shape these experiences. For example, revisiting the nature of how feedback is transmitted and used in graduate programs can prove to be beneficial for students (Kim, 2018). Specifically, Kim (2018) revealed that by harnessing feedback as an academic socialization process in which graduate students are repeatedly engaged in a dialogic exchange that emphasizes growth, self-worth development, and academic belongingness can be preferred over considering feedback as a traditional tool to evaluate and correct graduate students. Therefore, favouring consistent writing groups, academic workshops, and enhance focus on integrated feedback networks can alleviate some barriers that are involved in the experience of impostor feelings.

Furthermore, this is particularly relevant as perfectionist graduate students are at risk of poorly receive or interpret the feedback unless their performance is being recognized as exceptional or even perfect. *Study 3* revealed that perfectionist graduate students exhibited heightened susceptibility to experience impostor feelings, compared to excellencists, when they faced situations that threatened their academic self-worth. Specifically, the negative peer-reviewed feedback scenario, elicited significantly stronger impostor feelings among graduate students high in perfectionistic standards compared to those characterized by excellencism. Moreover, this effect was magnified when perfectionists perceived their scientific productivity to be low or insufficient for publication. In this context, the internal pressure to meet rigid

perfectionistic standards clashes with perceived underperformance, reinforcing the belief that they are not truly competent or deserving of their academic success. Contrastingly, excellence strivers were found to be less reactive to these threats, suggesting a more resilient and flexible response to the many and frequent academic setbacks they face during their program.

Taken together, these results highlight a crucial experiential divide between graduate students pursuing perfection and those striving for excellence. Perfectionists internalize shortcomings as a reflection of their self-worth, while excellence strivers are more likely to contextualize them as part of the learning and development process. This distinction extends the MEP as it offers key insights into why perfectionistic standards, rather than high standards, are uniquely associated with the experience of impostor feelings, especially in highly evaluative and performance-oriented contexts that are central to the graduate students' experience.

Limitations and Future Research Directions

Limitations

The studies presented in this thesis provide novel insights into the complex relationships between perfectionism and excellencism and the experience of impostor feelings among graduate students. However, several limitations must be acknowledged to properly situate the findings of *Manuscript 1* and *Manuscript 2*.

Design. First, the studies included in *Manuscript 1* and *Manuscript 2* are correlational, which limits the conclusions that can be drawn from the results as it is not possible to infer causality. Therefore, it is difficult to determine whether perfectionism influences the experience of impostor feelings, or alternatively, if it is the experience of impostor feelings that influences perfectionism, or if both reciprocally influence each other (Smith et al., 2021). Because of the non-experimental nature of the models tested in *Study 4*, the significant indirect relationship

between perfectionistic standards and the experience of impostor feelings should be interpreted with caution as the temporal ordering and directionality are limited. Despite theoretical and conceptual justifications suggesting that perfectionistic standards precede impostor feelings and operate through the signature expression of perfectionism (Gaudreau, 2021; Gaudreau et al., 2024).

Second, *Studies 2* and *3* relied heavily on cross-sectional evaluation, which has been found to be criticized (Spector, 2019) and overly utilized in the perfectionism literature (Smith et al., 2021; Gaudreau et al., 2024). While these studies provided crucial insight into the associations between perfectionistic standards, impostor feelings, and academic contextual variables (e.g., scientific research productivity, annual research productivity, peer-reviewed feedback), the cross-sectional design prevents any definitive conclusions about the directionality or temporality of these relationships. This is particularly important given the theoretical emphasis on how perfectionistic standards may enact the experience of impostor feelings through the signature expression of perfectionism (Gaudreau, 2021). However, *Manuscript 2* offers a valuable complement to this limitation by employing a short longitudinal design. *Study 4* introduced a temporal dimension with two-time points, one at the start of the semester, and one at the end of the semester, which strengthens the plausibility of causal interpretation – although limited. Nonetheless, the inclusion of a short-longitudinal design helps clarify whether perfectionistic standards predict later change in perfectionistic concerns and self-presentation, and indirectly the experience of impostor feelings. Although *Study 4* remains correlational in nature and not fully address concerns and limitations regarding causality, it offers more robust evidence for the theorized state enactment of the experience of impostor feelings (Gullifor et al., 2023) by demonstrating the directional consistency of perfectionistic standards over time.

Overall, while the studies presented in *Manuscripts 1* and *2* provide valuable evidence consistent with the theoretical framework of the MEP (Gaudreau, 2019; 2021; Gaudreau et al., 2024), they contribute to building a foundation for future research that employs more rigorous designs (e.g., experimental manipulations, cross-lagged models) to validate and extend these findings.

Sample and participants. The characteristics of the samples recruited across *Studies 2 - 4* can limit the generalizability of the findings. First, *Studies 2 - 4* required all participants to be enrolled in a graduate program to be included in the analysis. However, there has been no attempt to include the type of program as a categorical variable that could allow for a more finite representation of the experience of impostor feelings between different graduate programs, such as completing a *master's degree* versus a doctoral degree. Collectively, more than 64% of all participants who took part in *Studies 2 - 4* were master's students, while 32.4% were doctoral or Ph.D. students. Therefore, not controlling for the type of program as a categorical variable may have underestimated the impact of the experience of impostor feelings and perfectionism among doctoral graduate students, because doctoral programs are often longer and have higher requirements than master's programs (Littleford et al., 2018). By aggregating the data across masters and doctoral students, the findings from *Studies 2 - 4* may mitigate important within-group variability. For instance, these differences may influence how perfectionistic standards are internalized, how impostor feelings are expressed, and how graduate students respond to performance-related stressors such as feedback or productivity expectations.

Measures. First, while this thesis successfully differentiates perfectionism from excellencism by following the theoretical guidelines of the MEP (Gaudreau, 2019, 2021), the concept of excellencism remains understudied in research on personal standards. The results

from *Study 1* revealed that proxies of the pursuit of personal standards of excellence are related with healthier outcomes, compared to proxies representing the pursuit of personal standards of perfection, which was related to unhealthier outcomes. Nevertheless, more research will be necessary to fully establish the conceptual distinctiveness, predictive value and long-term effects of excellencism on psychological well-being.

Second, a further limitation pertains to the measurement of impostor feelings, particularly in the absence of context-sensitive assessments in *Study 2*. In *Study 2*, impostor feelings were assessed using validated self-reported measures, partly capturing broad dispositional tendencies of the experience of impostor feelings, rather than situational fluctuations. Because the experience of impostor feelings is likely to fluctuate in various contexts (Gullifor et al., 2023), such as various academic events, this is especially relevant in academic contexts, where impostor feelings often emerge in response to performance-related situations (Leary et al., 2000). By relying solely on global self-reported measures, *Study 2* may have overlooked important state-like experiences of impostor feelings. In contrast, *Studies 3 and 4* took steps to address this limitation by integrating the experience of impostor feelings within more ecologically valid and temporally relevant models. These models provided a more dynamic and process-oriented perspective on the experience of impostor feelings among graduate students, reinforcing the importance of situation triggers (Gullifor et al., 2023) and their interplay with perfectionistic tendencies.

Lastly, this thesis did not extensively explore institutional and social factors that might shape the experience of impostor feelings, such as mentorship or even social dynamics between peers and colleagues. For example, there is mounting evidence that mentoring relationships play a crucial role in the success of graduate students, particularly for doctoral students (Janssen et al.,

2021). This can limit the extent to which the findings of *Study 4* regarding the significant and positive indirect association between perfectionistic standards and the experience of impostor feelings through the manifestation of perfectionistic self-presentation tendencies can be generalized, as they represent important social factors in the context of graduate students. For instance, graduate students working under supportive and autonomy-promoting supervisors may feel more comfortable disclosing difficulties or acknowledging limitations, which could influence their need to engage in self-presentational strategies, such as non-disclosing imperfection to their supervisor (Hewitt et al., 2003). By not accounting for these relational dynamics, the findings from *Study 4* may overestimate the indirect relationship between perfectionistic standards and the experience of impostor feelings through signature expressions of perfectionism.

Taken together, these limitations highlight the need for future research to systematically integrate both trait and state assessment of impostor feelings, particularly when investigating their antecedents and consequences in academic context.

Future Directions

In order to address these limitations, future research should first prioritize experimental or intervention-based approaches, to examine more objectively the causal relationships between perfectionism, excellencism, perfectionistic self-presentation, perfectionistic concerns, and the experience of impostor feelings. Additionally, recent research using the MEP framework found that self-compassion successfully moderated the pervasive effects associated with perfectionism (With et al., 2024). Therefore, interventions focusing on self-compassion could prove promising to potentially reduce the extent to which graduate students experience impostor feelings.

Second, future research should consider the inclusion of cultural and cross-disciplinary categorical variables in their research design to determine whether the observed relationships found by *Manuscript 1* and *Manuscript 2* hold across diverse academic and professional contexts (Stone-Sabali, 2024). While gender differences have received a great deal of attention in previous research, a meta-analytical analysis by Bravata and colleagues (2019) yielded mixed results, with a common trend that both men and women experience impostor feelings. Furthermore, the studies presented in this thesis limited the status of high-achieving individuals within the context of graduate programs. However, few studies have examined the factors influencing the experience of impostor feelings within the workforce (Vergauwe et al., 2015; Gullifor et al., 2023; Stone-Sabali, 2024). Therefore, future research should seek to extend the examination of the situational antecedents of the experience of impostor feelings to non-academic populations.

Third, to further capture the contextual events that could contribute to the enactment of the experience of impostor feelings, future research should consider the use of experience sampling method. Daily diaries could provide a promising approach to assess how the experience of impostor feelings may fluctuate in response to specific academic events, as they would provide a more nuanced understanding of when and why some individuals experience impostor feelings.

Lastly, future research should explore the role of social factors, such as how graduate students perceive the quality of their relationship with their research supervisor, or how they perceive mentoring from their peers, in relation to how they experience the impostor feelings. Additionally, future studies should examine the MEP applicability outside the university context and assess whether its theoretical postulates hold in environments such as the workplace, where

performance metrics and social norms differ substantially. A promising approach that could address this would be the integration of models commonly used in management research, such as the Leader Member Exchange model (LMX; Shore et al., 2006), as it can reveal crucial information pertaining to the quality of the relationship a graduate student has with their supervisor. To that extent, considering the quality of the relationship between a graduate student and their thesis supervisor can be an important academic factor that could be involved in the maintenance of the *Impostor Cycle*. Also, in recent years, there has been a drastic increase of *Social Media Influencers* (e.g., @erhatheexplorer³) publishing various types of curated social media content related to *an*⁴ experience of being a graduate student. However, there has been no attention given to the impact that the consumption of this specific type of content can have on how a graduate student may engage in self-presentation strategies to not feel left behind or excluded from the academic community.

Conclusion

Clance and Imes (1978) identified and introduced the concept of the impostor phenomenon to describe high-achieving individuals who, despite evidence of their success, felt like fraud and lived in constant fear of being exposed. Since then, the impostor phenomenon has sparked decades of research (Chrisman et al., 1995; Leary et al., 2000; French et al., 2008; Bravata et al., 2019; Gullifor et al., 2023), yet many questions remained about why these feelings arise and persist, particularly in competitive academic environments which frequently praise the

³ Social media profile accessible on <https://www.instagram.com/erhatheexplorer?igsh=aDV2MGJrcjYyeTZj>

⁴ With the omnipresence of social media and social identity in the current academic landscape, research has yet to explore the specific challenges curating perfect social media may have on graduate students. Recent study revealing that most consumer of curated content will believe the social media influence to be credible if the content was *embellished* or *positive* in nature (Djafarova & Trofimenko, 2019).

pursuit of perfection (Curran & Hill, 2019). This doctoral thesis expanded on their foundational work by integrating the MEP framework and revealing that the experience of impostor feelings is closely associated with how graduate students strive to meet personal standards and how they manage their fear of being seen as imperfect. Specifically, this doctoral thesis revealed that not all high-achieving behaviours are the same when it comes to experiencing impostor feelings.

In sum, many graduate students, even those who are high achievers, continue to struggle with the experience of impostor feelings. It shows that these feelings are not simply the result of aiming and striving toward high personal standards, but more deeply tied to how graduate students experience their personal standards, especially when those standards are rigid and perfectionistic. The need to hide flaws, avoid mistakes, and always appear successful and productive reinforces a cycle in which impostor feelings grow stronger over time. By distinguishing between excellencism and perfectionism and highlighting the specific ways graduate students feel like an impostor, this doctoral research program offers a clearer understanding of the experience of impostor feelings in an academic setting. Ultimately, these insights can help guide more supportive environments for graduate students, ones that encourage openness, growth and most importantly, the acceptance of imperfection.

References General Introduction and Discussion

- Alfermann, D., Holl, C., & Reimann, S. (2021). “Should I stay or should I go?” Indicators of dropping out thoughts of doctoral students in computer science. *International Journal of Higher Education*, 10(3), 246. <https://doi.org/10.5430/ijhe.v10n3p246>
- Andrews, J. (2023). Recruiting doctoral students: Getting it right for all involved. *Encyclopedia*, 3(4), 1262–1269. <https://doi.org/10.3390/encyclopedia3040091>
- Ayres, Z. J. (2022). Why you earned it: Fighting the impostor. In *Managing your Mental Health during your PhD* (pp. 85–100). Springer International Publishing. https://doi.org/10.1007/978-3-031-14194-2_7
- Bair, C. R., Grant Haworth, J., & Sandfort, M. (2004). Doctoral student learning and development: A shared responsibility. *NASPA Journal*, 41(4), 709–727. <https://doi.org/10.2202/1949-6605.1395>
- Barry, K. M., Woods, M., Warnecke, E., Stirling, C., & Martin, A. (2018). Psychological health of doctoral candidates, study-related challenges and perceived performance. *Higher Education Research and Development*, 37(3), 468–483. <https://doi.org/10.1080/07294360.2018.1425979>
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *PSYCHOLOGICAL SCIENCE IN THE PUBLIC INTEREST*, 4(1).
- Bekkouche, N. S., Schmid, R. F., & Carliner, S. (2022). “Simmering pressure”: How systemic stress impacts graduate student mental health. *Performance Improvement Quarterly*, 34(4), 547–572. <https://doi.org/10.1002/piq.21365>
- Bien, K., Wagner, J., & Brandt, N. D. (2024). Who tends to be a perfectionistic adolescent? Distinguishing perfectionism from excellencism and investigating the links with the Big Five and self-esteem. *British Journal of Psychology*. <https://doi.org/10.1111/bjop.12739>

- Bravata, D. M., Watts, S. A., Keefer, A. L., Madhusudhan, D. K., Taylor, K. T., Clark, D. M., Nelson, R. S., Cokley, K. O., & Hagg, H. K. (2019). Prevalence, predictors, and treatment of impostor syndrome: a systematic review. *Journal of General Internal Medicine*, 35(4), 1252–1275. <https://doi.org/10.1007/s11606-019-05364-1>
- Burcaş, S., & Creţu, R. Z. (2021). Multidimensional perfectionism and test anxiety: A meta-analytic review of two decades of research. *Educational Psychology Review*, 33(1), 249–273. <https://doi.org/10.1007/s10648-020-09531-3>
- Canning, E. A., LaCosse, J., Kroeper, K. M., & Murphy, M. C. (2020). Feeling like an imposter: The effect of perceived classroom competition on the daily psychological experiences of first-generation college students. *Social Psychological and Personality Science*, 11(5), 647–657. <https://doi.org/10.1177/1948550619882032>
- Carless, D., Jung, J., & Li, Y. (2023). Feedback as socialization in doctoral education: towards the enactment of authentic feedback. *Studies in Higher Education*. <https://doi.org/10.1080/03075079.2023.2242888>
- Castelló, M., Pardo, M., Sala-Bubaré, A., & Suñe-Soler, N. (2017). Why do students consider dropping out of doctoral degrees? Institutional and personal factors. *Higher Education*, 74(6), 1053–1068. <https://doi.org/10.1007/s10734-016-0106-9>
- Chrisman, S. M., Pieper, W. A., Clance, P. R., Holland, C. L., & Glickauf-Hughes, C. (1995). Validation of the Clance Impostor Phenomenon Scale. *Journal of Personality Assessment*, 65(3), 456–467. https://doi.org/10.1207/s15327752jpa6503_6
- Clance, P., & Lawry, S. (2024). Impostor phenomenon: Origins and treatment. In *The impostor phenomenon: Psychological research, theory, and interventions*. (pp. 17–43). American Psychological Association. <https://doi.org/10.1037/0000397-002>

Clance, P. R. (1985). *The impostor phenomenon: Overcoming the fear that haunts your success*.

Peachtree Pub Limited.

Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241–247.

<https://doi.org/10.1037/h0086006>

Clance, P. R., & O'Toole, M. A. (1987). The imposter phenomenon: An internal barrier to empowerment and achievement. *Women and Therapy*, 6(3), 51–64.

https://doi.org/10.1300/J015V06N03_05

Cohen, E. D., & McConnell, W. R. (2019). Fear of fraudulence: graduate school program environments and the impostor phenomenon. *Sociological Quarterly*, 60(3), 457–478.

<https://doi.org/10.1080/00380253.2019.1580552>

Cokley, K., Harris, K., Hall, S., & Singletary, M. (2024). An overview of the impostor phenomenon: Definitional and theoretical considerations. In *The impostor phenomenon: Psychological research, theory, and interventions*. (pp. 45–60). American Psychological Association.

<https://doi.org/10.1037/0000397-003>

Cokley, K., Stone, S., Krueger, N., Bailey, M., Garba, R., & Hurst, A. (2018). Self-esteem as a mediator of the link between perfectionism and the impostor phenomenon. *Personality and Individual Differences*, 135, 292–297. <https://doi.org/10.1016/j.paid.2018.07.032>

Cowie, M. E., Nealis, L. J., Sherry, S. B., Hewitt, P. L., & Flett, G. L. (2018). Perfectionism and academic difficulties in graduate students: Testing incremental prediction and gender moderation. *Personality and Individual Differences*, 123, 223–228.

<https://doi.org/10.1016/j.paid.2017.11.027>

- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychological Assessment, 14*(3), 365–373.
<https://doi.org/10.1037/1040-3590.14.3.365>
- Cuddy, A. (2015). *Presence: Bringing your boldest self to your biggest challenges*. Little, Brown and Company.
- Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin, 145*(4), 410–429.
<https://doi.org/10.1037/bul0000138>
- Devos, C., Boudrenghien, G., Van der Linden, N., Azzi, A., Frenay, M., Galand, B., & Klein, O. (2017). Doctoral students' experiences leading to completion or attrition: a matter of sense, progress and distress. *European Journal of Psychology of Education, 32*(1), 61–77.
<https://doi.org/10.1007/s10212-016-0290-0>
- Djafarova, E., & Trofimenko, O. (2019). 'Instafamous'—credibility and self-presentation of micro-celebrities on social media. *Information Communication and Society, 22*(10), 1432–1446.
<https://doi.org/10.1080/1369118X.2018.1438491>
- Dudău, D. P. (2014). The relation between perfectionism and impostor phenomenon. *Procedia - Social and Behavioral Sciences, 127*, 129–133. <https://doi.org/10.1016/j.sbspro.2014.03.226>
- Feenstra, S., Begeny, C. T., Ryan, M. K., Rink, F. A., Stoker, J. I., & Jordan, J. (2020). Contextualizing the impostor “syndrome.” *Frontiers in Psychology, 11*(November).
<https://doi.org/10.3389/fpsyg.2020.575024>
- Feldon, D. F., Litson, K., Cahoon, B., Feng, Z., Walker, A., & Tofel-Grehl, C. (2024). The predictive validity of the GRE across graduate outcomes: A meta-analysis of trends over time. *Journal of Higher Education, 95*(1), 120–148. <https://doi.org/10.1080/00221546.2023.2187177>

- Ferrari, J. R., & Thompson, T. (2006). Impostor fears: Links with self-presentational concerns and self-handicapping behaviours. *Personality and Individual Differences*, 40(2), 341–352.
<https://doi.org/10.1016/j.paid.2005.07.012>
- Fisher, A. J., Mendoza-Denton, R., Patt, C., Young, I., Eppig, A., Garrell, R. L., Rees, D. C., Nelson, T. W., & Richards, M. A. (2019). Structure and belonging: Pathways to success for underrepresented minority and women PhD students in STEM fields. *PLoS ONE*, 14(1).
<https://doi.org/10.1371/journal.pone.0209279>
- Flett, G. L., & Hewitt, P. L. (2020). Reflections on three decades of research on multidimensional perfectionism: An introduction to the special issue on further advances in the assessment of perfectionism. *Journal of Psychoeducational Assessment*, 38(1), 3–14.
<https://doi.org/10.1177/0734282919881928>
- Flett, G. L., Hewitt, P. L., Nepon, T., & Besser, A. (2018). Perfectionism cognition theory: The cognitive side of perfectionism. In *The psychology of perfectionism* (pp. 89–110). Routledge.
- Fraenza, C. B. (2016). The role of social influence in anxiety and the imposter phenomenon. *Online Learning Journal*, 20(2). <https://doi.org/10.24059/olj.v20i2.618>
- French, B. F., Ullrich-French, S. C., & Follman, D. (2008). The psychometric properties of the Clance Impostor Scale. *Personality and Individual Differences*, 44(5), 1270–1278.
<https://doi.org/10.1016/j.paid.2007.11.023>
- Garba, R., Coleman, C., & Kelley, T. (2024). The impostor phenomenon and mental health. In *The impostor phenomenon: Psychological research, theory, and interventions*. (pp. 61–79). American Psychological Association. <https://doi.org/10.1037/0000397-004>

- Gaudreau, P. (2019). On the distinction between personal standards perfectionism and excellencism: A theory elaboration and research agenda. *Perspectives on Psychological Science*, 14(2), 197–215. <https://doi.org/10.1177/1745691618797940>
- Gaudreau, P. (2021). Separating the core definitional feature and the signature expressions of dispositional perfectionism: Implications for theory, research, and practice. *Personality and Individual Differences*, 181(May), 110975. <https://doi.org/10.1016/j.paid.2021.110975>
- Gaudreau, P., & Benoit, A. (2025). Distinguishing perfectionism and excellencism in graduate students: Contrasting links with performance satisfaction, research self-efficacy, burnout and dropout intentions. *British Journal of Psychology*.
- Gaudreau, P., Boileau, L., & Schellenberg, B. J. I. (2021). Peur de l'échec à l'école et dans les sports: Apport du modèle de l'excellencisme et du perfectionnisme. *Revue Québécoise de Psychologie*, 42(3), 173. <https://doi.org/10.7202/1084584ar>
- Gaudreau, P., & Schellenberg, B. J. I. (2022). Attitudes of sport fans toward the electronic sign-stealing scandal in major league baseball: Differing associations with perfectionism and excellencism. *Journal of Sport and Exercise Psychology*, 44(3), 220–229. <https://doi.org/10.1123/JSEP.2021-0136>
- Gaudreau, P., & Schellenberg, B. J. I. (2024). The impact of internet-based cognitive behavior therapy for perfectionism: a reinterpretation through the lens of the Model of Excellencism and Perfectionism. *Behavioural and Cognitive Psychotherapy*, 52(3), 288–300. <https://doi.org/10.1017/S1352465823000516>
- Gaudreau, P., Schellenberg, B. J. I., Gareau, A., Kljajic, K., & Manoni-Millar, S. (2022). Because excellencism is more than good enough: On the need to distinguish the pursuit of excellence

from the pursuit of perfection. *Journal of Personality and Social Psychology*.

<https://doi.org/10.1037/pspp0000411>

Gaudreau, P., Schellenberg, B. J. I., & Quesnel, M. (2024). From theory to research: Interpretational guidelines, statistical guidance, and a Shiny App for the Model of Excellencism and Perfectionism. *Submitted for Publication*.

Ghose, T., Ali, S., & Keo-Meier, B. (2018). Diversity in social work doctoral programs: Mapping the road ahead. *Research on Social Work Practice*, 28(3), 265–271.

<https://doi.org/10.1177/1049731517710725>

Goulet-Pelletier, J. C., Beaudin, M. F., & Cousineau, D. (2025). Investigating the negative link between perfectionism and emotional divergent thinking. *Discover Psychology*, 5(1).

<https://doi.org/10.1007/s44202-025-00330-x>

Goulet-Pelletier, J. C., Gaudreau, P., & Cousineau, D. (2022). Is perfectionism a killer of creative thinking? A test of the model of excellencism and perfectionism. *British Journal of Psychology*, 113(1), 176–207. <https://doi.org/10.1111/bjop.12530>

Gullifor, D. P., Gardner, W. L., Karam, E. P., Noghani, F., & Coglisier, C. C. (2023). The impostor phenomenon at work: A systematic evidence-based review, conceptual development, and agenda for future research. In *Journal of Organizational Behavior*. John Wiley and Sons Ltd.

<https://doi.org/10.1002/job.2733>

Hall, J. D., O'Connell, A. B., & Cook, J. G. (2017). Predictors of student productivity in biomedical graduate school applications. *PLoS ONE*, 12(1). <https://doi.org/10.1371/journal.pone.0169121>

Hay, A., & Samra-Fredericks, D. (2016). Desperately seeking fixedness: Practitioners' accounts of 'becoming doctoral researchers.' *Management Learning*, 47(4), 407–423.

<https://doi.org/10.1177/1350507616641599>

- Hewitt, P. L., Flett, G. L., Sherry, S. B., Habke, M., Parkin, M., Lam, R. W., McMurtry, B., Ediger, E., Fairlie, P., & Stein, M. B. (2003). The interpersonal expression of perfection: Perfectionistic self-presentation and psychological distress. *Journal of Personality and Social Psychology*, 84(6), 1303–1325. <https://doi.org/10.1037/0022-3514.84.6.1303>
- Hill, A. P., Mallinson-Howard, S. H., & Jowett, G. E. (2018). Multidimensional perfectionism in sport: A meta-analytical review. *Sport, Exercise, and Performance Psychology*, 7(3), 235–270. <https://doi.org/10.1037/spy0000125>
- Holden, C. L., Wright, L. E., Herring, A. M., & Sims, P. L. (2021). Imposter syndrome among first- and continuing-generation college students: The roles of perfectionism and stress. *Journal of College Student Retention: Research, Theory and Practice*. <https://doi.org/10.1177/15210251211019379>
- Horta, H., & Li, H. (2023). Nothing but publishing: the overriding goal of PhD students in mainland China, Hong Kong, and Macau. *Studies in Higher Education*, 48(2), 263–282. <https://doi.org/10.1080/03075079.2022.2131764>
- Janssen, S., van Vuuren, M., & de Jong, M. D. T. (2021). Sensemaking in supervisor-doctoral student relationships: revealing schemas on the fulfillment of basic psychological needs. *Studies in Higher Education*, 46(12), 2738–2750. <https://doi.org/10.1080/03075079.2020.1804850>
- Jaremka, L. M., Ackerman, J. M., Gawronski, B., Rule, N. O., Sweeny, K., Tropp, L. R., Metz, M. A., Molina, L., Ryan, W. S., & Vick, S. B. (2020). Common academic experiences no one talks about: Repeated rejection, impostor syndrome, and burnout. *Perspectives on Psychological Science*, 15(3), 519–543. <https://doi.org/10.1177/1745691619898848>

- Jones, B. E., Combs, J. P., & Skidmore, S. T. (2019). Admission criteria for educational leadership doctoral students in one U.S. doctoral program. *International Journal of Doctoral Studies*, 14, 351–365. <https://doi.org/10.28945/4251>
- Jones, M. (2018). Contemporary trends in professional doctorates. *Studies in Higher Education*, 43(5), 814–825. <https://doi.org/10.1080/03075079.2018.1438095>
- Kim, K. M. (2018). Academic socialization of doctoral students through feedback networks: a qualitative understanding of the graduate feedback landscape. *Teaching in Higher Education*, 23(8), 963–980. <https://doi.org/10.1080/13562517.2018.1449741>
- Leary, M. R., Patton, K. M., Orlando, A. E., & Funk, W. W. (2000). The impostor phenomenon: Self-perceptions, reflected appraisals, and interpersonal strategies. *Journal of Personality*, 68(4), 725–756. <https://doi.org/10.1111/1467-6494.00114>
- Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2017). The relationship between perfectionism and psychopathology: A meta-analysis. *Journal of Clinical Psychology*, 73(10), 1301–1326. <https://doi.org/10.1002/jclp.22435>
- Litalien, D. (2014). *Persévérance aux études de doctorat (Ph.D.): Modèle prédictif des intentions d'abandon* [Doctoral]. Laval University.
- Litalien, D., & Guay, F. (2015). Dropout intentions in PhD studies: A comprehensive model based on interpersonal relationships and motivational resources. *Contemporary Educational Psychology*, 41, 218–231. <https://doi.org/10.1016/j.cedpsych.2015.03.004>
- Littleford, L. N., Buxton, K., Bucher, M. A., Simon-Dack, S. L., & Yang, K. L. (2018). Psychology doctoral program admissions: What master's and undergraduate-level students need to know. *Teaching of Psychology*, 45(1), 75–83. <https://doi.org/10.1177/0098628317745453>

- Lo, A., Hunt, C., & Abbott, M. J. (2020). A systematic review of the psychometric properties of multidimensional trait perfectionism self-report measures. *Behaviour Change*, 37(2), 45–58. <https://doi.org/10.1017/bec.2020.2>
- Madigan, D. J. (2019). A meta-analysis of perfectionism and academic achievement. *Educational Psychology Review*, 31(4), 967–989. <https://doi.org/10.1007/s10648-019-09484-2>
- Mak, K. K. L., Kleitman, S., & Abbott, M. J. (2019). Impostor phenomenon measurement scales: A systematic review. *Frontiers in Psychology*, 10(APR). <https://doi.org/10.3389/fpsyg.2019.00671>
- Mantai, L., & Marrone, M. (2022). Identifying skills, qualifications, and attributes expected to do a PhD. *Studies in Higher Education*, 47(11), 2273–2286. <https://doi.org/10.1080/03075079.2022.2061444>
- McCulloch, A., & Thomas, L. (2013). Widening participation to doctoral education and research degrees: A research agenda for an emerging policy issue. *Higher Education Research and Development*, 32(2), 214–227. <https://doi.org/10.1080/07294360.2012.662630>
- McGregor, L. N., Gee, D. E., & Posey, K. E. (2008). I feel like a fraud and it depresses me: The relation between the imposter phenomenon and depression. *Social Behavior and Personality*, 36(1), 43–48. <https://doi.org/10.2224/sbp.2008.36.1.43>
- Meerah, T. S. M., Osman, K., Zakaria, E., Ikhsan, Z. H., Krish, P., Lian, D. K. C., & Mahmod, D. (2012). Measuring graduate students research skills. *Procedia - Social and Behavioral Sciences*, 60, 626–629. <https://doi.org/10.1016/j.sbspro.2012.09.433>
- Mulolli, D., & Gothberg, J. (2022). How Doctoral Students with Low GRE Scores Succeed: A Grounded Theory Study. *Qualitative Report*, 27(12), 14–32. <https://doi.org/10.46743/2160-3715/2023.5672>

- Nettles, M. T., Millett, C. M., & Millett, C. M. (2006). *Three magic letters: Getting to Ph. D.* JHU Press.
- OECD. (2019). *Education at a glance 2019 : OECD indicators*. OECD Publishing.
<https://doi.org/10.1787/f8d7880d-en>
- Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, 32(10), 972–983. <https://doi.org/10.1037/pas0000942.supp>
- Pannhausen, S., Klug, K., & Rohrmann, S. (2020). Never good enough: The relation between the impostor phenomenon and multidimensional perfectionism. *Current Psychology*, 41(2), 888–901. <https://doi.org/10.1007/s12144-020-00613-7>
- Pervez, A., Brady, L. L., Mullane, K., Lo, K. D., Bennett, A. A., & Nelson, T. A. (2021). An empirical investigation of mental illness, impostor syndrome, and social support in management doctoral programs. *Journal of Management Education*, 45(1), 126–158.
<https://doi.org/10.1177/1052562920953195>
- Pétrin-Pomerleau, P., Andrade, G., Verner-Filion, J., Schellenberg, B. J., & Gaudreau, P. (2025). Exploring social disconnection through the lens of the model of excellencism and perfectionism. *Journal of Social and Clinical Psychology*, 44(2), 149–183.
- Pitt, R., & Mewburn, I. (2016). Academic superheroes? A critical analysis of academic job descriptions. *Journal of Higher Education Policy and Management*, 38(1), 88–101.
<https://doi.org/10.1080/1360080X.2015.1126896>
- Racine, P., Vachon Laflamme, S., Gaudreau, P., & Langlois, F. (2025). Please don't stop the music! A new look at the performance anxiety of musicians with the model of excellencism and perfectionism. *Psychology of Music*. <https://doi.org/10.1177/03057356241300538>

- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: A narrative systematic review. *Sports Medicine*, 46(9), 1333–1353. <https://doi.org/10.1007/s40279-016-0492-2>
- Rohrmann, S., Bechtoldt, M. N., & Leonhardt, M. (2016). Validation of the impostor phenomenon among managers. *Frontiers in Psychology*, 7(JUN). <https://doi.org/10.3389/fpsyg.2016.00821>
- Shin, Y. W., & Kim, M. H. (2024). Validation study on the Korean version of the scale of perfectionism-Excellencism (K-SCOPE). *The Korean Journal of Counseling and Psychotherapy*, 36(4), 1311–1335.
- Shore, L. M., Tetrick, L. E., Lynch, P., & Barksdale, K. (2006). Social and Economic Exchange: Construct Development and Validation. *Journal of Applied Social Psychology*, 34(4), 837–867.
- Sirois, F. M., & Molnar, D. S. (2016). Perfectionism, Health, and Well-Being. In *Perfectionism, Health, and Well-Being*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-18582-8>
- Smith, M. M., Sherry, S. B., Chen, S., Saklofske, D. H., Mushquash, C., Flett, G. L., & Hewitt, P. L. (2018). The perniciousness of perfectionism: A meta-analytic review of the perfectionism–suicide relationship. *Journal of Personality*, 86(3), 522–542. <https://doi.org/10.1111/jopy.12333>
- Smith, M. M., Sherry, S. B., Ge, S. Y. J., Hewitt, P. L., Flett, G. L., & Baggle, D. L. (2022). Multidimensional perfectionism turns 30: A review of known knowns and known unknowns. *Canadian Psychology*, 63(1), 16–31. <https://doi.org/10.1037/cap0000288>
- Smith, M. M., Sherry, S. B., Ray, C., Hewitt, P. L., & Flett, G. L. (2021). Is perfectionism a vulnerability factor for depressive symptoms, a complication of depressive symptoms, or both? A meta-analytic test of 67 longitudinal studies. *Clinical Psychology Review*, 84. <https://doi.org/10.1016/j.cpr.2021.101982>

- Sonnak, C., & Towell, T. (2001). The impostor phenomenon in British university students: Relationships between self-esteem, mental health, parental rearing style and socioeconomic status. *Personality and Individual Differences*, 31(6), 863–874. [https://doi.org/10.1016/S0191-8869\(00\)00184-7](https://doi.org/10.1016/S0191-8869(00)00184-7)
- Spector, P. E. (2019). Do not cross me: Optimizing the use of cross-sectional designs. *Journal of Business and Psychology*, 34(2), 125–137. <https://doi.org/10.1007/s10869-018-09613-8>
- Stoeber, J. (2018). Comparing two short forms of the Hewitt–Flett Multidimensional Perfectionism Scale. *Assessment*, 25(5), 578–588. <https://doi.org/10.1177/1073191116659740>
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, 10(4), 295–319. https://doi.org/10.1207/s15327957pspr1004_2
- Stone-Sabali, S. (2024). Trends within the impostor phenomenon literature. In *The impostor phenomenon: Psychological research, theory, and interventions*. (pp. 341–362). American Psychological Association. <https://doi.org/10.1037/0000397-016>
- Sverdlik, A., C. Hall, N., & McAlpine, L. (2020). PhD imposter syndrome: Exploring antecedents, consequences, and implications for doctoral well-being. *International Journal of Doctoral Studies*, 15, 737–758. <https://doi.org/10.28945/4670>
- Tape, N., Dry, M., Monaghan, B., Tan, N., & Turnbull, D. (2024). The Scale of Perfectionism and Excellencism (SCOPE): an adolescent-based validation study for the measurement of perfectionism and excellencism. *Educational and Developmental Psychologist*, 41(1), 3–11. <https://doi.org/10.1080/20590776.2023.2289627>
- Thompson, T., Davis, H., & Davidson, J. (1998). Attributional and affective responses of impostors to academic success and failure outcomes. *Personality and Individual Difference*, 25, 381–396.

- Thompson, T., Foreman, P., & Martin, F. (2000). Impostor fears and perfectionistic concern over mistakes. *Personality and Individual Differences*, 29(4), 629–647.
[https://doi.org/10.1016/S0191-8869\(99\)00218-4](https://doi.org/10.1016/S0191-8869(99)00218-4)
- van Rooij, E., Fokkens-Bruinsma, M., & Jansen, E. (2021). Factors that influence PhD candidates' success: the importance of PhD project characteristics. *Studies in Continuing Education*, 43(1), 48–67. <https://doi.org/10.1080/0158037X.2019.1652158>
- Vergauwe, J., Wille, B., Feys, M., De Fruyt, F., & Anseel, F. (2015). Fear of being exposed: The trait-relatedness of the impostor phenomenon and its relevance in the work context. *Journal of Business and Psychology*, 30(3), 565–581. <https://doi.org/10.1007/s10869-014-9382-5>
- Wang, K. T., Sheveleva, M. S., & Permyakova, T. M. (2019). Imposter syndrome among Russian students: The link between perfectionism and psychological distress. *Personality and Individual Differences*, 143(January), 1–6. <https://doi.org/10.1016/j.paid.2019.02.005>
- Watson, D. R., Gustafsson, H., & Lundqvist, C. (2023). Working with perfectionistic athletes in sport. In *The Psychology of Perfectionism in Sport, Dance, and Exercise* (2nd ed., pp. 285–304). Routledge. <https://doi.org/10.4324/9781003288015-14>
- Weber, C. T., Borit, M., Canolle, F., Hnatkova, E., OO'Neil, G., Pacitti, D., & Parada, F. (2018). *Identifying and documenting transferable skills and competences to enhance early career researchers employability and competitiveness*. <https://doi.org/10.5281/zenodo.1299178>
- With, S., Benoît, A., & Gaudreau, P. (2024). Self-compassion as a moderator in the relationships of excellencism and perfectionism with indicators of mental Health. *Mindfulness*, 15(7), 1650–1664. <https://doi.org/10.1007/s12671-024-02388-5>

APPENDICES A-D

APPENDIX A

Questionnaires: Study 2

Please do not refer to the last few weeks amidst the Covid-19 pandemic during which your school-related habits have potentially been profoundly impacted. We are interested to know about your overall school experiences as a graduate student.

Section 1 : Background information

1.1. What is your age ?

___ years old

1.2. Please indicate your gender

- Male
- Female
- You don't have an option that applies to me. I Identify as (please specify): ___
- **Please select the option that best represents the program you are currently in.**
- Master program
- Doctoral program
- PhD program
- Combined master and PhD program
- Other (please specify): ___

1.3. Please indicate your current year of enrolment in your program

___ year

1.4. Have you successfully defended your viva (e.g., comprehensive exam)?

- No
- Yes
- Not applicable in my program

1.5. Have you successfully defended your thesis proposal?

- No
- Yes

- Not applicable in my program

1.6. What describe your current enrolment in your program?

- Full-time
- Part-time
- Other (please specify): ____

1.7. Do you have the intention to enroll in a PhD program?

- Yes
- No
- Not applicable because I am already in a PhD program

1.8. Do you have the intention to pursue a Post-Doc?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1.9 How do you describe yourself in terms of cultural background?

- White/Caucasian
- Latino/Hispanic
- East Asian
- Black/African American
- South Asian
- Middle Eastern
- African
- Indigenous
- Mixed
- Other: _____

1.10 Please write the name of the country in which you currently live.

1.11 Please write the name of your university.

1.12 How would you describe your family social class

- working class.
- lower middle.
- middle.
- upper-middle.
- upper-class

1.12 How would you assess your economic status.

- (1) Very good ----- (5) Very bad

1.13 Please report your grade point average (GPA) from your undergraduate diploma

- (1) = F (0-39%)
- (2) = E (40-49%)
- (3) = D (50-54%)
- (4) = D+ (55-59%)
- (5) = C (60-64%)
- (6) = C+ (65-69%)
- (7) = B (70-74%)
- (8) = B+ (75-79%)
- (9) = A- (80-84%)
- (10) = A (85-89%)
- (11) = A+ (90-100%)

Section 2:

Please indicate the extent to which each item represents the goals that you generally pursue in your life.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

As a person, my general goal in life is to...

- 2.1 ... have very good performances.
- 2.2 ... be a competent person.
- 2.3 ... accomplish great things.
- 2.4 ... be very productive.
- 2.5 ... be a skillful person.
- 2.6 ... produce high-quality work.
- 2.7 ... attain difficult but realistic goals.
- 2.8 ... successfully learn difficult things.
- 2.9 ... reach excellence.
- 2.10 ... perform very well.
- 2.11 ... work very hard until I reach excellence.

Continued

As a person, my general goal in life is to...

- 2.12 ... have perfect performances.
- 2.13 ... be a perfect person.
- 2.14 ... accomplish great things perfectly.
- 2.15 ... be exceptionally productive all the time.
- 2.16 ... be a flawless person.
- 2.17 ... produce error-free work.
- 2.18 ... attain perfection.
- 2.19 ... perfectly learn difficult things.
- 2.20 ... reach perfection.
- 2.21 ... perform perfectly.
- 2.22 ... work relentlessly until I reach perfection.

Section 3

Part 3.1

Please take a moment to reflect back at the start of your graduate program. How much do you agree with each of the following statement?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1. I have often succeeded on a test or task even though I was afraid that I would not do well before I undertook the task.
2. I can give the impression that I'm more competent than I really am.
3. I avoid evaluations if possible and have a dread of others evaluating me.
4. When people praise me for something I've accomplished, I'm afraid I won't be able to live up to their expectation of me in the future.
5. 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.
6. I'm afraid people important to me may find out that I'm not as capable as they think I am.
7. I tend to remember the incidents in which I have not done my best more than those times I have done my best.
8. I rarely do a project or task as well as I'd like to do it.
9. Sometimes I feel or believe that my success in my life or in my job has been the result of some kind of error.
10. It's hard for me to accept compliments or praise about my intelligence or accomplishments.
11. At times, I feel my success has been due to some kind of luck.
12. I'm disappointed at times in my present accomplishments and think I should have accomplished much more.
13. Sometimes I'm afraid others will discover how much knowledge or ability I really lack.
14. I'm often afraid that I may fail at a new assignment or undertaking even though I generally do well at what I attempt.
15. When I've succeeded at something and received recognition for my accomplishments, I have doubts that I can keep repeating that success.
16. If I receive a great deal of praise and recognition for something I've accomplished, I tend to discount the importance of what I've done.
17. I often compare my ability to those around me and think they may be more intelligent than I am.
18. I often worry about not succeeding with a project or examination, even though others around me have considerable confidence that I will do well.

19. If I'm going to receive a promotion or gain recognition of some kind, I hesitate to tell others until it is an accomplished fact.
20. I feel bad and discouraged if I'm not "the best" or at least "very special" in situations that involve achievement.

Part 3.2

Please take a moment to reflect back on the start of your graduate program. How much do you agree with each of the following statement?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1. I felt like people might find out that I am not as capable as they think I am.
2. I felt like my success were due to some kind of luck.
3. I was afraid others would discover how much knowledge or ability I really lack.
4. I felt like an “imposter”.

Section 4:**Part 4.1**

In general, how does each item represent your life in graduate school?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1. In my graduate program I am bursting with energy.
2. I find the work in my graduate program full of meaning and purpose.
3. Time flies when I am working on school-related tasks.
4. I feel strong and vigorous when I am working on school-related tasks.
5. I am enthusiastic about my studies.
6. When I am working in my graduate program, I forget everything around me.
7. My graduate program inspires me.
8. I feel like going to school when I get up in the morning.
9. I feel happy when I am working intensively in my graduate program.

Part 4.2

In general, how does each item represent your life in graduate school?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1. I feel overwhelmed by the workload in my graduate program.
2. I feel a lack of motivation in my graduate program and often think of giving up.
3. I often have feelings of inadequacy in my graduate program.
4. I often sleep badly because of matters related to my graduate program.
5. I feel that I am losing interest in my graduate program.
6. I'm continually wondering whether my graduate program has any meaning.
7. I brood over matters related to my graduate program a lot during my free time.
8. I used to have higher expectations of my program than I do now.
9. The pressure of my program causes me problems in my close relationships with others.

Section 5

Part 5.1

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

In these questions, the word “supervisor” is meant to refer to the individual(s) who are responsible of supervising critical tasks of your graduate studies (e.g., research, clinical internship).

Please rate your agreement with each of the statements using the following scale.

1. It's okay to show my supervisor that I am not perfect
2. I judged myself based on the mistakes that I make in my work with my supervisor
3. I will do almost anything to avoid revealing a mistake to my supervisor
4. Errors are much worse if my supervisor is aware of them than if they are made in private
5. I always try to present myself as a picture of perfection to my supervisor
6. It would be awful if I made an intellectual fool of myself in front of my supervisor
7. If I seem perfect, my supervisor will see me more positively
8. I brood over mistakes that I have made while working with my supervisor
9. I never let my supervisor know how hard I need to work to stay on top of things
10. I would like to appear more competent to my supervisor than I really am
11. It really matters if my work is judged as imperfect by my supervisor
12. I do not want my supervisor to see my work unless it is near perfection
13. I should always keep my problems to myself rather than disclose them to my supervisor
14. I should solve my own problems rather than admit them to my supervisor
15. I must appear to be in control of my work at all times
16. I am ashamed to admit my mistakes to my supervisor
17. It is important to act perfectly in all situations with my supervisor
18. I really care about being seen as perfectly competent in the eyes of my supervisor
19. Admitting difficulties to my supervisor is the worst possible thing
20. I hate to admit to my supervisor that I don't understand something
21. I pretend to easily understand everything with my supervisor
22. I avoid making mistakes at all cost when working on a project with my supervisor
23. I need to be seen as perfectly capable by my supervisor in everything I do
24. Struggling at something is awful if my supervisor knows about it
25. Appearing “on top of things” with my supervisor is a top priority for me
26. I must always appear to be perfect to my supervisor
27. I strive to look perfect for my supervisor

Part 5.2

Over the past year of your graduate program, please indicate how often...

Never	One time	A few times	Many times
-------	----------	-------------	------------

1. ... I canceled a meeting with my supervisor because I felt my work has been inadequate.
2. ... I invented a reason to avoid meeting with my supervisor.
3. ... I postponed a meeting with my supervisor even know if I knew I shouldn't.
4. ... I delayed an important meeting with my supervisor because I failed to work on what I was supposed to do.

Part 5.3

In this section you will be presented with a series of questions regarding yours feeling about your graduate program.

How confident are you of being able to graduate from your program of studies?

1. Not at all confident
2. Slightly confident
3. Moderately confident
4. Very confident
5. Totally confident

Part 5.4

Indicate how often you had each of these feelings during the past year

Never	Very rarely	Rarely	Sometimes	Frequently	Very frequently	Always
-------	-------------	--------	-----------	------------	-----------------	--------

1. I considered dropping out of [university, graduate school]
2. I had some intentions to drop out of [university, graduate school]
3. I thought that I would be happier by quitting [university, graduate school]
4. I wished I could change [program, to another research topic]
5. I wished I could change university [research supervisor]

Section 6

Part 6.1

So far, in my graduate studies, I feel like I am capable of...

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1. ... planning, applying and executing externally funded research projects.
2. ... spending a few years at a foreign university in order to obtain additional qualifications.
3. ... giving talks at international conferences and workshops.
4. ... finding partners for collaboration.
5. ... publishing regularly in scientific journals.
6. ... developing and implementing my own research ideas.
7. ... serving as an advisor to other students conducting thesis research.

Part 6.2

Considering the year into your program (and comparing yourself to other students in your field), how would you rate your level of scientific productivity?

- Not at all satisfactory
- Very little satisfactory
- A little satisfactory
- Moderately satisfactory
- Strongly satisfactory
- Very strongly satisfactory
- Totally satisfactory

Part 6.3

Compared to other students in your field (at the same stage into their program), please situate your level of scientific productivity?

1st to 10th percentile (Extremely Low) --- 50th percentile (Average) ---- 90th to 100th (Extremely High)

Section 7

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your degree of agreement with each item.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1. In most ways my life in graduate school is close to my ideal.
2. The conditions of my life in graduate school are excellent.
3. I am satisfied with my life in graduate school.
4. So far I have gotten the important things I want from my graduate studies.
5. If I could start over my graduate program, I would change almost nothing.

Section 8

Writing for your research is an important task frequently performed by graduate students. To do so, most graduate students use a computer device connected to the internet. In this section, we want to know how frequently you are doing each of these behaviours on your computer while writing for your research.

0	1	2	3	4	5
Never	Very rarely	Rarely	Often	Very often	Almost always

When you sit down in front of a computer to write for your research, how often do you...

- 1 ... take and/or read your research-related notes on your computer?
- 2 ... search research-related complementary information on the web?
- 3 ... read articles and/or books on your computer to facilitate your writing?
- 4 ... navigate on websites that are not related to research?
- 5 ... visit social networking sites?
- 6 ... use your computer to watch videos/pictures?
- 7 ... do online shopping?
- 8 ... chat and/or text?
- 9 ... play video games?
- 10 ... write emails unrelated to your research?
- 11 ... spend time organizing stuff on your computer?
- 12 ... use your computer to interact with your supervisor and/or collaborators in one way or another?
- 13 ... feel your computer is a source of distraction?
- 14 ... shut off your phone to prevent you from being distracted?
- 15 ... waste time doing many other things except writing

Section 9

To conclude, we just finish some additional information to better understand your life as a graduate student.

9.1. Do you have any children under the age of 5?

- 0
- 1
- 2
- 3+

9.2. Do you have children attending primary school?

- 0
- 1
- 2
- 3+

9.3. Do you have children attending high school?

- 0
- 1
- 2
- 3+

9.4. Did you lose a significant source of income at a certain point during the pandemic?

- Yes
- No
- Not applicable in my situation

9.5. Were you under financial strain at a certain point during the pandemic?

- Yes
- No

9.6. Did you have to attend to the need of a sick/vulnerable family member during the pandemic?

- Yes
- No

9.7. Did you develop symptoms related to COVID-19 at a certain point during the pandemic?

- Yes
- No

9.8. Did one of your family members developed symptoms related to COVID-19 at a certain point during the pandemic?

- Yes
- No

9.9. Did the daycare or school of your child closed during the pandemic?

- Yes
- No
- Not applicable in my situation

9.10. Did you have access to a reliable access to high-speed internet at home?

- Yes
- No

9.11. Did you experience work overload because of your teaching assistantships (i.e., moving from in-class to online teaching)?

- Yes
- No
- Not applicable in my situation

9.12 Did you answer the questions on this survey honestly? __Yes __No

APPENDIX B

Questionnaires: Study 3 & Study 4 (Time 1)

Part 1 : Background information

1.1. What is your age ?

___ years old

1.2. Please indicate your gender

- Male
- Female
- You don't have an option that applies to me. I Identify as (please specify): ___

1.3. Please select the option that best represents the program you are currently in.

- Master program
- Doctoral program
- PhD program
- Combined master and PhD program
- Other (please specify): ___

1.4. Do you have the intention to enroll in a PhD program?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1.5. Please indicate your current year of enrolment in your program

___ year

1.6. Have you successfully defended your viva (e.g., comprehensive exam)?

- No
- Yes
- Not applicable in my program

1.7. Do you have the intention to pursue a Post-Doc?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1.8. Have you successfully defended your thesis proposal?

- No
- Yes
- Not applicable in my program

1.9. What describe your current enrolment in your program?

- Full-time
- Part-time
- Other (please specify): ____

1.10. How do you describe yourself in terms of your cultural background?

- a) White
- b) Latino/Hispanic
- c) East Asian
- d) Black/
- e) African American
- f) South Asian
- g) Middle Eastern
- h) African
- i) Indigenous
- j) Mixed
- k) Other: _____

1.11. Please write the name of the country in which you currently study.

1.12. Please write the name of your university.

Part 2:

Please indicate the extent to which each item represents the goals that you generally pursue in your life.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

As a person, my general goal in life is to...

- 2.1 ... have very good performances.
- 2.2 ... be a competent person.
- 2.3 ... accomplish great things.
- 2.4 ... be very productive.
- 2.5 ... be a skillful person.
- 2.6 ... produce high-quality work.
- 2.7 ... attain difficult but realistic goals.
- 2.8 ... successfully learn difficult things.
- 2.9 ... reach excellence.
- 2.10 ... perform very well.
- 2.11 ... work very hard until I reach excellence.

Continued

As a person, my general goal in life is to...

- 2.12 ... have perfect performances.
- 2.13 ... be a perfect person.
- 2.14 ... accomplish great things perfectly.
- 2.15 ... be exceptionally productive all the time.
- 2.16 ... be a flawless person.
- 2.17 ... produce error-free work.
- 2.18 ... attain perfection.
- 2.19 ... perfectly learn difficult things.
- 2.20 ... reach perfection.
- 2.21 ... perform perfectly.
- 2.22 ... work relentlessly until I reach perfection.

Part 3**Part 3.1**

Since the start of your program, how much do you agree with each of the following statement?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

5. I felt like people might find out that I am not as capable as they think I am.
6. I felt like my success were due to some kind of luck.
7. I was afraid others would discover how much knowledge or ability I really lack.
8. I felt like an “imposter”.
9. I was afraid I would be discovered for who I really am.
10. I tended to feel like a phony.
11. I was afraid people important to me might find out that I was not as capable as they thought I am.
12. I felt like a great pretender; That is, I was not as genuine as others thought I am.
13. I acted like an imposter.
14. Please answer “a little agree”.

Part 4:**Part 4.1**

In general, how does each item represent your life in graduate school?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

10. In my graduate program I am bursting with energy.
11. I find the work in my graduate program full of meaning and purpose.
12. Time flies when I am working on school-related tasks.
13. I feel strong and vigorous when I am working on school-related tasks.
14. I am enthusiastic about my studies.
15. When I am working in my graduate program, I forget everything around me.
16. My graduate program inspires me.
17. I feel like going to school when I get up in the morning.
18. I feel happy when I am working intensively in my graduate program.

Part 4.2

In general, how does each item represent your life in graduate school?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

10. I feel overwhelmed by the workload in my graduate program.
11. I feel a lack of motivation in my graduate program and often think of giving up.
12. I often have feelings of inadequacy in my graduate program.
13. I often sleep badly because of matters related to my graduate program.
14. I feel that I am losing interest in my graduate program.
15. I'm continually wondering whether my graduate program has any meaning.
16. I brood over matters related to my graduate program a lot during my free time.
17. I used to have higher expectations of my program than I do now.
18. The pressure of my program causes me problems in my close relationships with others.

Part 5:

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

In these questions, the word “supervisor” is meant to refer to the individual(s) who are responsible of supervising critical tasks of your graduate studies (e.g., research, clinical internship).

Please rate your agreement with each of the statements using the following scale.

1. It's okay to show my supervisor that I am not perfect.
2. It is important to act as perfectly around my supervisor.
3. I will do almost anything to avoid revealing a mistake to my supervisor.
4. I have to look perfect when I am around my supervisor
5. If I seem perfect, my supervisor will like me more.
6. It would be awful if I made an intellectual fool of myself in front of my supervisor.
7. I try hard to look perfect around my supervisor.
8. I like trying to look perfect to my supervisor.
9. I think a lot about mistakes that I have made in front of my supervisor.
10. I feel bad about myself when I make mistakes in front of my supervisor
11. I want my supervisor to know about it when I do something well.
12. Mistakes are worse when my supervisor see me make them.
13. I do not want my supervisor to see even one of my bad points.
14. It would be bad if I made a fool of myself in front of my supervisor.
15. I do not let my supervisor know when I fail at something.
16. I am ashamed to admit my mistakes to my supervisor.
17. I should fix my own problems rather than telling them to my supervisor.
18. I never let my supervisor know how hard I work on things.

Part 5.2

Over the past year of your graduate program, please indicate how often...

Never	One time	A few times	Many times
-------	----------	-------------	------------

5. ... I canceled a meeting with my supervisor because I felt my work has been inadequate.
6. ... I invented a reason to avoid meeting with my supervisor.
7. ... I postponed a meeting with my supervisor even know if I knew I shouldn't.
8. ... I delayed an important meeting with my supervisor because I failed to work on what I was supposed to do.

Part 5.4

Indicate how often you had each of these feelings during the past year.

Never	Very rarely	Rarely	Sometimes	Frequently	Very frequently	Always
-------	-------------	--------	-----------	------------	-----------------	--------

6. I considered dropping out of graduate school.
7. I had some intentions to drop out of graduate school.
8. I thought that I would be happier by quitting graduate school.
9. I wished I could change program.
10. I wish I could change to another research topic.
11. I wished I could change university.
12. I wish I could change research supervisor.

Part 5.3

The following statements refer to your experience as a graduate student. Please indicate to what extent you agree or disagree with each of the following statement, using the scale below.

1	2	3	4	5
Strongly disagree	disagree	Neither agree or disagree	Agree	Strongly agree

1. I have doubts about most of my actions.
2. Others are disappointed in me whenever I don't do something perfectly.
3. I have difficulty forgiving myself when my performance is not flawless.
4. When I make a mistake, I feel like a failure.
5. Everyone expects me to be perfect.
6. I am never sure if I am doing things the correct way.
7. I am very concerned about the possibility of making a mistake.
8. When my performance falls short of perfection, I get very mad at myself.
9. I judge myself harshly when I don't do something perfectly.
10. I have doubts about everything I do.
11. The idea of making a mistake frightens me.
12. I feel uncertain about most things I do.
13. I feel disappointed with myself, when I don't do something perfectly
14. I tend to doubt whether I am doing something "right".
15. Others make excessive demands of me.
16. When I notice that I have made a mistake, I feel ashamed.
17. Making even a small mistake would upset me.
18. Others expect too much from me.

Section 6

Part 6.1

So far, in my graduate studies, I feel like I am capable of...

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

8. ... planning, applying and executing externally funded research projects.
9. ... spending a few years at a foreign university in order to obtain additional qualifications.
10. ... giving talks at international conferences and workshops.
11. ... finding partners for collaboration.
12. ... publishing regularly in scientific journals.
13. ... developing and implementing my own research ideas.
14. ... serving as an advisor to other students conducting thesis research.
15. ...please select moderately agree.

Part 6.2

Considering the year into your program (and comparing yourself to other students in your field), how would you rate your level of scientific productivity?

- Not at all satisfactory
- Very little satisfactory
- A little satisfactory
- Moderately satisfactory
- Strongly satisfactory
- Very strongly satisfactory
- Totally satisfactory

Part 6.3

Compared to other students in your field (at the same stage into their program), please situate your level of scientific productivity?

1st to 10th percentile (Extremely Low) --- 50th percentile (Average) ---- 90th to 100th (Extremely High)

Part 6.4

In the following section a series of scenarios will be presented to you. Please carefully read each scenario then indicate how you would react in each context presented to you.

6.4.A. Contextual scenario of impostor feelings A

After working several months on a research project, you decided to submit the results for publication in a scientific peer reviewed journal. This journal is a good fit for both the quality and subject of your research. This journal has previously published similar studies. You only received positive feedback from the editor and the reviewers. Based on their feedback you evaluate that your chances of being published in this journal are very good.

Using the scale below and while reflecting on the context presented above, indicate how much you agree with the following statements.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

In this situation...

1. ...I would feel like people might find out that I am not as capable as they think I am.
2. ...I would devalue the positive comments and feel like they were due to some kind of luck.
3. ...I would be afraid that others could discover how much knowledge or ability I really lack.
4. ...I would feel like an “imposter”.
5. ...I would modify my manuscript and resubmit it to the same journal.
6. ...If rejected, I would modify my manuscript and resubmit it to another journal.
7. ...I would consider dropping out of my graduate program.

6.4.B. Contextual scenario of impostor feelings B

After working several months on a research project, you decided to submit the results for publication in a scientific peer reviewed journal. This journal is a good fit for both the quality and subject of your research. This journal has previously published similar studies.

You received the same amount of positive and negative feedback from the editor and the reviewers. Based on their feedback, you evaluate that your chances of being published in this journal are average.

Using the scale below and while reflecting on the context presented above, indicate how much you agree with the following statements.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

In this situation...

1. ...I would feel like people might find out that I am not as capable as they think I am.
2. ...I would devalue the positive comments and feel like they were due to some kind of luck.
3. ...I would be afraid that others could discover how much knowledge or ability I really lack.
4. ...I would feel like an “imposter”.
5. ...I would modify my manuscript and resubmit it to the same journal.
6. ...If rejected, I would modify my manuscript and resubmit it to another journal.
7. ...I would consider dropping out of my graduate program.

6.4.C. Contextual scenario of impostor feelings C

After working several months on a research project, you decided to submit the results for publication in a scientific peer reviewed journal. This journal is a good fit for both the quality and subject of your research. This journal has previously published similar studies.

You received significantly more negative feedback compared to positive feedback from the editor and the reviewers. Based on their feedback, you evaluate that your chances of being published in this journal are very low.

Using the scale below and while reflecting on the context presented above, indicate how much you agree with the following statements.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

In this situation...

1. ...I would feel like people might find out that I am not as capable as they think I am.
2. ...I would devalue the positive comments and feel like they were due to some kind of luck.
3. ...I would be afraid that others could discover how much knowledge or ability I really lack.
4. ...I would feel like an “imposter”.
5. ...I would modify my manuscript and resubmit it to the same journal.
6. ...If rejected, I would modify my manuscript and resubmit it to another journal.
7. ...I would consider dropping out of my graduate program.

6.5. How many first author peer-reviewed publications did you publish since the start of your graduate program?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6.6. Excluding first author publication, how many peer-reviewed publications as an author did you publish since the start of your graduate program?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6.7. Excluding the one(s) that you published, how many manuscripts did you submit for publication to a peer-reviewed journal in the past year?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6.8. How many of your submissions were rejected by a peer-reviewed journal since the start of your graduate program?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6.9. How many times did you present your work (e.g., posters, symposium, oral presentation, etc.) at a scientific conference, since the start of your graduate program?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6.10. How many times did you present your work (e.g., poster, symposium, oral presentation, etc.) at a scientific conference, in the past year?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6.11. Were you awarded any form of external funding through a competition (i.e., from your university, government, external scholarship, etc.) since the beginning of your graduate program?

- Yes
- No

Section 7

We will conclude by asking you some additional information to better understand your experience as a graduate student.

Part 7.1

Please indicate to what extent you agree with the each of the following statement, using the scale below.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

6. In most ways my life in graduate school is close to my ideal.
7. The conditions of my life in graduate school are excellent.
8. I am satisfied with my life in graduate school.
9. So far I have gotten the important things I want from my graduate studies.
10. If I could start over my graduate program, I would change almost nothing.

Section 8

8.1 Did you answer the questions on this survey honestly? __Yes __No

APPENDIX C

Questionnaires: Study 4 (Time 2)

Section 1 : Background information

1.13. **Where you enrolled in a graduate program between September 1 2023 and December 22 2023 (2023 Fall semester)?**

- Yes
- No

1.14. **What is your age ?**
 ____ years old

1.15. **Please indicate your gender**

- Male
- Female
- You don't have an option that applies to me. I Identify as (please specify): ____

1.16. **Please select the option that best represents the program you are currently in.**

- Master program
- Doctoral program
- PhD program
- Combined master and PhD program
- Other (please specify): ____

1.17. **Do you have the intention to enroll in a PhD program?**

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1.18. **Please indicate your current year of enrolment in your program**
 ____ year

1.19. **Have you successfully defended your viva (e.g., comprehensive exam)?**

- No
- Yes
- Not applicable in my program

1.20. **Do you have the intention to pursue a Post-Doc?**

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

1.21. Have you successfully defended your thesis proposal?

- No
- Yes
- Not applicable in my program

1.22. What describe your current enrolment in your program?

- Full-time
- Part-time
- Other (please specify): ____

1.23. How do you describe yourself in terms of your cultural background?

- a) White
- b) Latino/Hispanic
- c) East Asian
- d) Black/
- e) African American
- f) South Asian
- g) Middle Eastern
- h) African
- i) Indigenous
- j) Mixed
- k) Other: _____

1.24. Please write the name of the country in which you currently study.

1.25. Please write the name of your university.

Section 2:

Please indicate the extent to which each item represents the goals that you generally pursue in your life.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

As a person, my general goal in life is to...

- 2.1 ... have very good performances.
- 2.2 ... be a competent person.
- 2.3 ... accomplish great things.
- 2.4 ... be very productive.
- 2.5 ... be a skillful person.
- 2.6 ... produce high-quality work.
- 2.7 ... attain difficult but realistic goals.
- 2.8 ... successfully learn difficult things.
- 2.9 ... reach excellence.
- 2.10 ... perform very well.
- 2.11 ... work very hard until I reach excellence.

Continued

As a person, my general goal in life is to...

- 2.12 ... have perfect performances.
- 2.13 ... be a perfect person.
- 2.14 ... accomplish great things perfectly.
- 2.15 ... be exceptionally productive all the time.
- 2.16 ... be a flawless person.
- 2.17 ... produce error-free work.
- 2.18 ... attain perfection.
- 2.19 ... perfectly learn difficult things.
- 2.20 ... reach perfection.
- 2.21 ... perform perfectly.
- 2.22 ... work relentlessly until I reach perfection.

Section 3**Part 3.1**

Since the start of the 2023 Fall semester (September 2023 to December 2023), how much do you agree with each of the following statement?

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

15. I felt like people might find out that I am not as capable as they think I am.
16. I felt like my success were due to some kind of luck.
17. I was afraid others would discover how much knowledge or ability I really lack.
18. I felt like an “imposter”.
19. I was afraid I would be discovered for who I really am.
20. I tended to feel like a phony.
21. I was afraid people important to me might find out that I was not as capable as they thought I am.
22. I felt like a great pretender; That is, I was not as genuine as others thought I am.
23. I acted like an imposter.
24. Please answer “a little agree”.

Section 4:**Part 4.1**

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

In these questions, the word “supervisor” is meant to refer to the individual(s) who are responsible of supervising critical tasks of your graduate studies (e.g., research, clinical internship).

Please rate your agreement with each of the statements using the following scale.

19. It's okay to show my supervisor that I am not perfect.
20. It is important to act as perfectly around my supervisor.
21. I will do almost anything to avoid revealing a mistake to my supervisor.
22. I have to look perfect when I am around my supervisor
23. If I seem perfect, my supervisor will like me more.
24. It would be awful if I made an intellectual fool of myself in front of my supervisor.
25. I try hard to look perfect around my supervisor.
26. I like trying to look perfect to my supervisor.
27. I think a lot about mistakes that I have made in front of my supervisor.
28. I feel bad about myself when I make mistakes in front of my supervisor
29. I want my supervisor to know about it when I do something well.
30. Mistakes are worse when my supervisor see me make them.
31. I do not want my supervisor to see even one of my bad points.
32. It would be bad if I made a fool of myself in front of my supervisor.
33. I do not let my supervisor know when I fail at something.
34. I am ashamed to admit my mistakes to my supervisor.
35. I should fix my own problems rather than telling them to my supervisor.
36. I never let my supervisor know how hard I work on things.

Part 4.2

Over the last semester of your graduate program (September to December 2023), please indicate how often...

Never	One time	A few times	Many times
-------	----------	-------------	------------

9. ... I canceled a meeting with my supervisor because I felt my work has been inadequate.
10. ... I invented a reason to avoid meeting with my supervisor.
11. ... I postponed a meeting with my supervisor even know if I knew I shouldn't.
12. ... I delayed an important meeting with my supervisor because I failed to work on what I was supposed to do.

Part 4.3

The following statements refer to your experience as a graduate student. Please indicate to what extent you agree or disagree with each of the following statement, using the scale below.

1	2	3	4	5
Strongly disagree	disagree	Neither agree or disagree	Agree	Strongly agree

1. I have doubts about most of my actions.
2. Others are disappointed in me whenever I don't do something perfectly.
3. I have difficulty forgiving myself when my performance is not flawless.
4. When I make a mistake, I feel like a failure.
5. Everyone expects me to be perfect.
6. I am never sure if I am doing things the correct way.
7. I am very concerned about the possibility of making a mistake.
8. When my performance falls short of perfection, I get very mad at myself.
9. I judge myself harshly when I don't do something perfectly.
10. I have doubts about everything I do.
11. The idea of making a mistake frightens me.
12. I feel uncertain about most things I do.
13. I feel disappointed with myself, when I don't do something perfectly
14. I tend to doubt whether I am doing something "right".
15. Others make excessive demands of me.
16. When I notice that I have made a mistake, I feel ashamed.
17. Making even a small mistake would upset me.
18. Others expect too much from me.

Section 5

Part 5.1

So far, in my graduate studies, I feel like I am capable of...

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

16. ... planning, applying and executing externally funded research projects.
17. ... spending a few years at a foreign university in order to obtain additional qualifications.
18. ... giving talks at international conferences and workshops.
19. ... finding partners for collaboration.
20. ... publishing regularly in scientific journals.
21. ... developing and implementing my own research ideas.
22. ... serving as an advisor to other students conducting thesis research.
23. ...please select moderately agree.

Part 5.2

Considering the 2023 Fall semester (September to December 2023) (and comparing yourself to other students in your field), how would you rate your level of scientific productivity?

- Not at all satisfactory
- Very little satisfactory
- A little satisfactory
- Moderately satisfactory
- Strongly satisfactory
- Very strongly satisfactory
- Totally satisfactory

Part 5.3

Compared to other students in your field (at the same stage into their program), please situate your level of scientific productivity?

1st to 10th percentile (Extremely Low) --- 50th percentile (Average) ---- 90th to 100th (Extremely High)

Part 5.4: Research productivity

5.4.1. How many first author peer-reviewed publications did you publish since the start of 2023 Fall semester (September to December 2023)?

- 0
- 1
- 2
- 3
- 4
- 5 or more

5.4.2. Excluding first author publication, how many peer-reviewed publications as an author did you publish since the start of the 2023 Fall semester (September to December 2023)?

- 0
- 1
- 2
- 3
- 4
- 5 or more

5.4.3. Excluding the one(s) that you published, how many manuscripts did you submit for publication to a peer-reviewed journal in 2023 Fall semester (September to December 2023)?

- 0
- 1
- 2
- 3
- 4
- 5 or more

5.4.4. How many of your submissions were rejected by a peer-reviewed journal since the start of the 2023 Fall semester (September to December 2023)?

- 0
- 1
- 2
- 3
- 4
- 5 or more

5.4.5. How many times did you present your work (e.g., posters, symposium, oral presentation, etc.) at a scientific conference, since the start of the 2023 Fall semester (September to December 2023)?

- 0
- 1
- 2
- 3
- 4
- 5 or more

5.4.6. How many times did you present your work (e.g., poster, symposium, oral presentation, etc.) at a scientific conference, in the 2023 Fall semester (September to December 2023)?

- 0
- 1
- 2
- 3
- 4
- 5 or more

5.4.7. Were you awarded any form of external funding through a competition (i.e., from your university, government, external scholarship, etc.) since the start of the 2023 Fall semester (September to December 2023)?

- Yes
- No

Section 6

We will conclude by asking you some additional information to better understand your experience as a graduate student.

Part 6.1

Please indicate to what extent you agree with the each of the following statement, using the scale below.

1	2	3	4	5	6	7
Not at all agree	Very little agree	A little agree	Moderately agree	Strongly agree	Very strongly agree	Totally agree

11. In most ways my life in graduate school is close to my ideal.
12. The conditions of my life in graduate school are excellent.
13. I am satisfied with my life in graduate school.
14. So far I have gotten the important things I want from my graduate studies.
15. If I could start over my graduate program, I would change almost nothing.

Section 7

7.1 Did you answer the questions on this survey honestly? __Yes __No

APPENDIX D

Research Ethics Board

Research Ethics Board

Study 2

17/10/2020

Université d'Ottawa

Bureau d'éthique et d'intégrité de la recherche

University of Ottawa

Office of Research Ethics and Integrity

CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL**Numéro du dossier / Ethics File Number**

H-06-20-5910

Titre du projet / Project TitleHard to feel accomplished? Your
experience as a graduate
student**Type de projet / Project Type**Recherche de professeur /
Professor's research project**Statut du projet / Project Status**

Approuvé / Approved

Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)

17/10/2020

Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)

16/10/2021

Équipe de recherche / Research Team**Chercheur / Researcher****Affiliation****Role**

Patrick GAUDREAU

École de psychologie / School of Psychology

Chercheur Principal / Principal Investigator

Antoine BENOIT

École de psychologie / School of Psychology

Assistant de recherche / Research Assistant

Conditions spéciales ou commentaires / Special conditions or comments

Research Ethics Board

Study 3 & 4

24/10/2023

Université d'Ottawa

Bureau d'éthique et d'intégrité de la recherche

University of Ottawa

Office of Research Ethics and Integrity

CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL**Numéro du dossier / Ethics File Number****Titre du projet / Project Title****Type de projet / Project Type****Statut du projet / Project Status****Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)****Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)**

H-06-20-5910

Hard to feel accomplished? Your
experience as a graduate
studentRecherche de professeur /
Professor's research project

Renouvelé / Renewed

17/10/2020

16/10/2024

Équipe de recherche / Research Team**Chercheur / Researcher**

Patrick GAUDREAU

Antoine BENOIT

École de psychologie / School of Psychology

École de psychologie / School of Psychology

Role

Chercheur Principal / Principal Investigator

Assistant de recherche / Research Assistant

Conditions spéciales ou commentaires / Special conditions or comments