Differentiating the Role of Perfectionism and High Standards in Young Adolescents

by

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COMMONLY USED ABBREVIATIONS THROUGHOUT THE THESIS

Abbreviation	Meaning
AMS	Academic Motivation Scale
APS-R	Almost Perfect Scale-Revised
CAPS	Child and Adolescent Perfectionism Scale
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
DASS-21	Short form of Depression, Anxiety and Stress Scale
EFA	Exploratory Factor Analysis
ERI	Eggers Regression Intercept
FMPS	Frost Multidimensional Perfectionism Scale
GFI	Goodness of Fit Index
HMPS	Hewitt Multidimensional Perfectionism Scale
LMM	Linear Mixed Modelling
OR	Odd's Ratio
RMSEA	Root Mean Square Error of Approximation
SCS	Self-Compassion Scale
TLI	Tucker-Lewis Index
WEMWBS	Warwick Edinburgh Mental Wellbeing Scale

ABSTRACT

Perfectionism has been shown to have adverse impacts on mental health, general well-being, and academic achievement in youth. However, confusion remains about the structure of perfectionism, commonly regarded to consist of two factors: perfectionistic strivings, traditionally labelled as 'adaptive' despite contradictory research, and perfectionistic concerns, consistently shown to be maladaptive. Preliminary evidence posits the mixed findings regarding perfectionistic strivings has emerged due to the lack of clarification between pursuing perfection versus high standards in perfectionism measures. Thus, the main aim of this thesis was to improve our understanding of any distinction across five different studies.

The first two studies rigorously examined the unique associations of perfectionism measures with varying outcomes: indicators of academic achievement, and self-compassion and self-criticism. Using meta-analytic techniques, it was found that subscales relating to perfectionistic strivings were positively related to academic performance and helpful academic outcomes, but only one subscale, High Standards from the Almost Perfect Scale Revised (APS-R), had protective associations with unhelpful academic outcomes. Small to large maladaptive associations were found between perfectionistic strivings and concerns with self-compassion and self-criticism. However, High Standards from the APS-R shared a small but significant positive association with self-compassion. Lower self-compassion also tended to partially mediate the relationship between Discrepancy and psychological distress, suggesting that increasing self-compassion may counter the harmful effects of perfectionism.

The third study examined exploratory and confirmatory factor analyses on measures of perfectionism, followed by correlational and regression analyses. Using 282 high school students (aged 13-15 years), results supported a 3-factor model as the model of choice (Concerns, Strivings, High Standards). The High Standards were also found to be better

understood separately from a General Perfectionism factor. Perfectionistic Concerns had unique associations demonstrating impairments in well-being and academic motivation, while High Standards revealed unique positive associations with well-being.

Studies 4 and 5 evaluated a school-based program designed to decrease perfectionism, while fostering high standards and self-compassion. Impact on well-being, self-compassion, academic motivation and negative affect was also assessed at post-intervention and 3-month follow-up. The 3-lesson pilot study (study 4, $N = 93$) revealed no significant differences between the intervention and control conditions but small to medium effect sizes in favor of the intervention were found for perfectionistic concerns, self-compassion, and negative affect. Study 5 tested a boosted 5-lesson universal program ($N = 636$, $M_{age} = 13.68$) and found no differences in perfectionism between the intervention and control group. At 3-month follow-up, anxiety showed a significant increase in the control group with no commensurate increase in the intervention group ($d = 0.23$). Moderating effects found females in the control group significantly decreased in well-being from post-intervention to 3-month follow-up compared to those in the intervention ($d = 0.33$), while those experiencing problematic levels of perfectionism in the intervention experienced significant decreases in self-oriented perfectionism compared to those with low levels ($d = 0.40$).

Taken together, these results support a distinction between perfectionism and high standards. The notion that perfectionistic strivings are ‘adaptive’ should be disbanded from future discourse. Universal school-based intervention and prevention work in this area is critical and the protocol for the program outlined in this thesis appear encouraging in the context of other mental health prevention programs in schools. Further research is needed to clarify perfectionism versus high standards to better understand this complex construct, with longitudinal model testing examining self-compassion and self-criticism as potential mechanisms which may differentiate these constructs.

DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for degree or diploma in any university, and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

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Chapter 1

Overview, Aims and Structure

Overview of Issues Explored in this Thesis

Perfectionistic Strivings and Perfectionistic Concerns

Perfectionism is a personality dimension commonly characterised by setting extremely high standards of performance, accompanied by unrelenting efforts to attain these standards, measuring self-worth with regard to success, and self-criticism when standards are not attained (Frost et al., 1990; Hewitt & Flett, 1991; Shafran et al., 2002; Slaney et al., 2001). Traditionally considered a unidimensional construct (Burns, 1980; Polivy et al., 1981), perfectionism is currently conceptualised as multidimensional, comprising of a variety of facets and characteristics dependent on the researcher and model in question (i.e., Frost, 1990; Hewitt & Flett, 1991; Slaney et al., 2001).

The three most commonly used multidimensional measures of perfectionism include the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990), the Hewitt Multidimensional Perfectionism Scale (HMPS; Hewitt & Flett, 1991) and associated child and adolescent version (CAPS; Hewitt et al., 2016), and the Almost Perfect Scale-Revised (APS-R; Slaney et al., 2001). Factor analyses across measures (Bieling et al., 2004; Cox et al., 2002; Clara et al., 2007; Frost et al., 1993; Suddarth & Slaney, 2001) suggest perfectionism consists of two higher-order factors – perfectionistic strivings and perfectionistic concerns (Enns & Cox, 2002; Frost et al., 1993; Suddarth & Slaney, 2001). However, these higher-order factors demonstrate considerable overlap (Stoeber & Gaudreau, 2017), and more recent research examining models of perfectionism using bifactor techniques have evidenced that perfectionistic strivings and concerns are better understood when a general perfectionism factor is considered (Gade et al., 2017; Howell et al., 2020; Prior et al., 2018; Smith & Saklofske, 2017). Perfectionistic strivings refer to the propensity to set self-oriented excessive and demanding high personal standards, whilst perfectionistic concerns relate to extremely critical self-appraisals following failure, concerns over making mistakes,

and feelings of discrepancy between one's expectations and perceived performance (Cox et al., 2002). The measurement subscales associated with perfectionistic strivings include Personal Standards, Organisation, High Standards, Order, and Self-Oriented Perfectionism, while the subscales associated with perfectionistic concerns include Concern Over Mistakes, Doubts About Actions, Discrepancy, Socially Prescribed Perfectionism, Parental Expectations and Parental Criticism.[1]

Perfectionism has been well-established in the literature as a transdiagnostic risk factor in both adults and youth for various psychopathologies, playing an important role in both the development and maintenance of adverse psychopathological outcomes (Egan et al., 2011; Limburg et al., 2017). In particular, perfectionistic concerns has consistently displayed associations with depression, anxiety, and eating disorders (Bieling et al., 2004; Handley et al., 2014; Huprich et al., 2008; Kehayes et al., 2019; Vacca et al., 2020), as well as suicidal ideation and self-harm (Jones et al., 2008; Smith et al., 2018). Perfectionistic concerns have also been found to longitudinally predict depressive symptoms (Smith et al., 2016), and impede therapeutic treatment outcomes for depression (Blatt et al., 1998) and anxiety (Mitchell et al., 2013). In the academic environment, perfectionistic concerns have shared similar maladaptive associations with academic performance (Madigan, 2019), as well as outcomes causing harm to both academic achievement and mental well-being (i.e., test anxiety, procrastination, burnout, decreased academic satisfaction; Arana & Furlan, 2016; Closson & Boutilier, 2017; Kljajic et al., 2017; Montgomery et al., 2017). It should be noted, however, the relationship perfectionism holds with such indicators of academic success is yet to be quantitatively synthesised and clarified in a formal review.

[1] It will be noted that throughout this dissertation, reference to specific subscale names from perfectionism measures (i.e., Discrepancy) and factor names derived from specific factor analyses will be capitalised, as per APA guidelines. General constructs (i.e., perfectionistic concerns, high standards) will be referred to in lower case.

Perfectionistic strivings, however, have traditionally been considered ‘adaptive’ (Stoeber & Otto, 2006), given some research demonstrating positive associations with life satisfaction, positive affect, and decreased feelings of psychological distress (Chang et al., 2004; Frost et al., 1993; Molnar et al., 2006). In a meta-analytic review, perfectionistic strivings shared positive associations with academic performance (Madigan, 2019), and while the overall effect of striving for perfection on outcomes indicative of academic success remain unknown, studies have found positive relationships between perfectionistic strivings with academic self-efficacy and adjustment to academic life (Bong et al., 2014; Mofield & Peters, 2018). Moreover, research in other areas such as sport and exercise have suggested those high in perfectionistic strivings may experience greater sporting achievement (Hill et al., 2018), and less burnout (Hill & Curran, 2016). Nevertheless, there has been a recent push to eliminate the labelling of perfectionistic strivings as ‘adaptive’ (Hewitt et al., 2017) given established associations with psychopathology and suicidal ideation (Limburg et al., 2017; Smith et al., 2018). Striving for perfection has also conferred vulnerability for depressive symptoms at follow-up (Bekés et al., 2015; Smith et al., 2020), preceded bulimic symptoms in females over a 3-month period (Steele et al., 2007), is associated with increased fear and sadness in children (Stornelli et al., 2009), increased feelings of social isolation and decreased social functioning (Magson et al., 2019), maladaptive stress in the academic environment (Hewitt et al., 2016), and impaired work performance (Sherry et al., 2010). These mixed findings pertaining to perfectionistic strivings raises some questions – while striving for perfection may be related to instances of ‘adaptive outcomes’ such as increased performance, what cost is this to one’s mental health and wellbeing?

Perfectionism Versus High Standards

Some researchers have strongly advocated against the labelling of perfectionistic strivings as ever being ‘adaptive’ given its established associations with psychopathology

(Greenspon, 2000; Hewitt & Flett, 2002, 2014; Wade, 2018). It has been argued perfectionistic strivings may be adaptive when perfectionistic concerns are not present, and indeed, models of perfectionism have been postulated and tested with this theory in mind in an attempt to better understand the adaptive nature of strivings (i.e., the 2 x 2 model of perfectionism by Gaudreau & Thompson, 2010). Moreover, such research has advocated for perfectionism literature to use methodology to control for the overlap of the two perfectionism dimensions using partial and semi-partial correlations when examining their relationships with other outcomes in order to capture the effect of 'pure perfectionistic strivings' (Stoeber & Gaudreau, 2017). Indeed, following the use of such methods, perfectionistic strivings have evidenced to share stronger 'adaptive' associations, such as negative associations with sporting burnout (Hill et al., 2018). It is important to note, however, that this methodology has received criticism (Hewitt & Flett, 2017) as this approach may remove the self-criticism innate to those who rigidly strive for perfection. In other words – what is the likelihood that such an individual, who strives for seamless perfection, does not also readily experience concerns over making mistakes and a fear of failure and self-criticism if such standards are not reached? Preliminary research in this area has noted that, in times of successive failure, those high in perfectionistic strivings are susceptible to increased psychological distress and self-criticism (Hewitt & Flett, 1993; 2002). Evidence also suggests those high in striving for perfection experience increased levels of anxiety, self-criticism and lower performance following successive failures of a task (Besser et al., 2004; Hill et al., 2011), and are subsequently more likely to continue setting increasingly unrealistic, higher standards of performance (Kobori et al., 2009; Shafran et al., 2002). Moreover, studies have commented on the minimal number of participants found in their samples that exhibit 'true' perfectionistic strivings without accompanying perfectionistic concerns (Gotwals & Spencer-Cavaliere, 2014; Nordin-Bates & Kuysler, 2020; Sellars et al., 2016).

Emerging theory has suggested that in order to better understand the mixed findings and so-called ‘adaptiveness’ of perfectionistic strivings, we must begin to distinguish pursing perfection versus pursuing high standards (Gaudreau, 2019). This is an area of research yet to be explored. More specifically, there is debate whether some measures used to typically assess strivings may be partially confounded or measuring striving for healthy high standards, versus a rigid striving for perfection – and this may, in part, explain the mixed findings with regard to perfectionistic strivings. Indeed, as there is little uniformity in the way perfectionism is measured and given researchers have used different combinations of measures and definitions to conceptualise perfectionistic strivings (i.e., Stoeber & Otto, 2006), it is plausible to suggest that the lack of differentiation between striving for perfection versus striving for high standards may account for the conclusions pertaining to perfectionistic strivings as ‘adaptive’. In an important study, Blasberg and colleagues (2016) argued some measures used to assess perfectionistic strivings do not adequately capture the all-or-nothing thinking that is central to the definition of perfectionism (i.e., the High Standards subscale from the APS-R), and empirically demonstrated how modifying the wording of items on this measure (e.g., adding in the word ‘perfection’ instead of ‘excellence’ to adequately describe pursuing perfection) versus using the original items ultimately affected the relationship between positive or negative outcomes for depression. These findings highlight the crucial need to distinguish between pursuit of high standards as opposed to the rigid pursuit of perfection and the need for more research examining perfectionistic strivings subscales (i.e., unique associations of perfectionistic strivings measures with varying outcomes, factor-analytic approaches) to address this gap in the literature, and hence inform future model development and treatment approaches.

Universal Perfectionism Interventions

Perfectionism has linearly increased in youth between 1989 to 2017 (Curran & Hill, 2019), with 25-30% of youth classified as a perfectionist with maladaptive outcomes (Hawkins et al., 2006; Sironic & Reeve, 2015). Research has also identified adolescence as a key period for the development of perfectionism (Flett et al., 2002; Gilman & Ashby, 2006), with a recent meta-analysis suggesting no differences in the prevalence of perfectionism based on intellectual ability (Stricker et al., 2020). As such, there has been increased attention in recent years on interventions for youth that target perfectionism universally in school-based settings (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017). To date, only a handful of studies have investigated universal prevention-based programs targeting perfectionism explicitly (Morris & Lomax, 2014), with those published showing associated decreases in negative affect (Nehmy & Wade, 2015) and increases in well-being (Vekas & Wade, 2017). This latter study was one of the first to explicitly focus on targeting a striving for perfection while fostering a healthy striving for high standards in a sample of primary school children aged 10-12, as well as cultivating self-compassion in the face of failure, the importance of which will be discussed below. Such a program has yet to be tested in a sample of young adolescents. Moreover, no studies to date have examined the efficacy of teacher-led programs for perfectionism, which has been postulated as an advantageous avenue with regard to the ability to more broadly disseminate widespread prevention programs (Han & Weiss, 2005).

The Role of Self-Compassion and Self-Criticism

Given the detrimental associations with psychopathological outcomes, it is crucial to understand the risk and protective factors that influence perfectionism. It may be useful to examine the transdiagnostic processes involved in responding to failure, hardship, and success, particularly since perfectionism is postulated to be detrimental in these

circumstances (Shafran et al., 2002). Self-compassion, defined as a compassionate attitude towards oneself involving kindness in the face of failure (Neff, 2003), has been established as a promising protective factor against a range of psychopathologies (MacBeth & Gumley, 2012; Marsh et al., 2017). Evidence also suggests self-compassion may be a key ingredient in buffering the harmful effects of perfectionism on psychopathology (Abdhollahi et al., 2020; Ferrari et al., 2018). In contrast, self-criticism, the punitive attitude towards oneself when standards are not met (Shahar, 2015), is prevalent in a wide range of psychopathologies (Fennig et al., 2008; Luyten et al., 2007; Zelkowitz & Cole, 2018). Associated with both dimensions of perfectionism (Sherry & Hall, 2009), self-criticism has shown to play a role in the harmful relationship between perfectionism and psychopathology including depressive symptoms (Manfredi et al., 2016) and psychological distress (James et al., 2015). It seems that self-compassion and self-criticism may play a part in future model development, however, to date there has been no synthesis of the degree to which self-compassion and self-criticism are associated with, and impact on, perfectionism, and whether this supports mechanisms related to mediation or moderation.

Aims of this Research

Significant gaps in the literature remain in the field of perfectionism literature whereby a clearer understanding of the construct of perfectionism is needed. Taken together, the adverse consequences of perfectionism on mental health and wellbeing (Limburg et al., 2017; Smith et al., 2018), the high prevalence of perfectionism in youth (Hawkins et al., 2006; Sironic & Reeve, 2015), and linear increase in the last three decades (Curran & Hill, 2019) indicates a crucial need to better understand the structure of perfectionism to inform treatment and prevention strategies (Medical Research Council, 2019). Specifically, there is urgency in clarifying the difference between perfectionistic strivings versus high standards (Gaudreau, 2019), in terms of adverse and helpful outcomes (Leone & Wade, 2018),

including outcomes in the academic environment that influence achievement and well-being, as well as transdiagnostic processes that can exacerbate or protect against the impact of perfectionism, such as self-compassion and self-criticism. As such, the overarching aim of this thesis is to differentiate the role of perfectionism and high standards in youth to allow better precision for developing effective prevention and early intervention strategies, utilizing three approaches: meta-analytic techniques, factor-analytic techniques, and longitudinal research examining the efficacy of an intervention program.

The first specific aim of the thesis was to develop a better understanding of measures of perfectionism by examining the strength of associations between subscales of perfectionism and academic performance, self-compassion and self-criticism. Subscales across the most commonly used multidimensional perfectionism measures (HMPS, FMPS, APS-R, CAPS) were examined with their relationship with academic performance, as well as important cognitive, behavioural, affective) indicators for academic achievement and well-being (academic burnout and stress, test anxiety, procrastination, self-efficacy, engagement, satisfaction, adjustment, hardiness, learning strategies). In a similar vein, using meta-analytic techniques, this thesis examined the association between perfectionistic concerns, perfectionistic strivings, and unique subscales on self-compassion and self-criticism, and systematically reviewed the mediating effects of these processes on perfectionism and indicators of mental well-being. As self-compassion and self-criticism are important psychological mechanisms in exacerbating the effects of perfectionism on psychopathology, this research aimed to inform future model development to better understand the harmful effects of perfectionistic concerns and perfectionistic strivings, and hence inform treatment strategies for targeting perfectionism.

The second specific aim was to examine the factor structure of perfectionism utilising the High Standards subscale from the APS-R independently from its traditional

perfectionistic strivings grouping. This is another important piece of the puzzle to understand whether this particular subscale is more reflective of a healthy high striving for achievement, or striving for perfection, and whether these two concepts are fundamentally different in nature. Thus, this thesis also aimed to clarify the construct of perfectionism by examining the factor structure across the most common perfectionism measures, with a focus on comparing a 2- versus 3-factor model accounting for a 'High Standards' factor.

The third specific aim, given the harmful impact of perfectionism on youth (Leone & Wade, 2018), was to evaluate a universal intervention program for perfectionism, with a focus on fostering high standards, decreasing a rigid striving for perfection, and replacing self-criticism with a self-compassionate response in the face of failure. If there is a differentiation between healthy high striving for achievement and striving for perfection, we expect to see the intervention differentially impact measures reflecting these different constructs.

Summary of Chapters

Despite much attention in the literature (Hewitt, 2020), perfectionism remains a complex construct (Cheek et al., 2019), and a variety of conceptualisations exist in order to make sense of how to best understand and treat this personality dimension. Accordingly, **Chapter 2** was generated to present a comprehensive overview of the literature at present. A focus is directed on detailing the conceptualisations and theoretical models of perfectionism, the relationship perfectionism holds with mental health and academic outcomes (including the confusion about the 'adaptiveness' of perfectionistic strivings), emerging research detailing the need to better clarify perfectionism versus high standards, current interventions for perfectionism, and finally, a summary of the research involving perfectionism and two important transdiagnostic processes: self-compassion and self-criticism, in an attempt to inform future model development.

The role perfectionism has in the academic environment remains unclear due to the mixed findings detailing the adaptiveness of perfectionistic strivings. Hence, the research presented in **Chapter 3** involved a meta-analysis investigating role of perfectionism in factors indicating academic success and well-being. Specifically, this chapter examined the unique relationship between subscales measuring perfectionistic strivings and perfectionistic concerns (including the most commonly used multidimensional perfectionism measures, the FMPS, HMPS, APS-R and CAPS) to both academic performance and academic outcomes related to achievement and successful learning (cognitive, emotional, and behavioral) across studies using meta-analytic techniques, with a meta-analysis examining the former (Madigan, 2019), but not associations with broader academic outcomes. It was found that perfectionistic concerns shared harmful relationships with all outcomes, while perfectionistic strivings shared positive relationships with performance and helpful outcomes. The High Standards subscale from the APS-R, however, was uniquely negatively related to unhelpful outcomes of academic success ($r+ = -.23$). These findings provide important insight into the role perfectionism plays in the academic environment. Moreover, this study provided further evidence that the High Standards subscale from the APS-R may be differentiated by other perfectionistic strivings subscales in terms of its protective association with adverse outcomes and thus may be more consistent with measuring one's pursuit of healthy high standards rather than a relentless pursuit of perfectionistic standards. This paper was published in *Psychological Assessment* (Osenk et al., 2020).

The next study (**Chapter 4**) also used a meta-analysis and systematic review to examine the relationship between perfectionism with two important psychological processes: self-compassion and self-criticism. This paper is the first to quantitively and qualitatively synthesise such relationships, and the aims were twofold: First, the associations between overall perfectionistic concerns and perfectionistic strivings, and respective unique subscales,

with self-compassion and self-criticism were summarised in a meta-analytic framework. Second, studies that tested how self-compassion and self-criticism might impact the association between perfectionism and mental health were summarised, in order to come to some conclusions that can inform future model development, and hence treatment. As hypothesised, it was found that overall, perfectionistic concerns and perfectionistic strivings shared negative relationships with self-compassion and positive relationships with self-criticism. Consistent with findings from **Chapter 3**, the High Standards subscale from the APS-R shared a unique positive relationship with self-compassion ($r+ = .24$), evidencing a differentiation with other perfectionistic strivings subscales. Moreover, lower self-compassion tended to partially mediate the relationship between perfectionistic concerns (the discrepant feeling between one's standards and actual performance) and psychological distress. These findings highlighted the importance of increasing self-compassion in countering the harmful effects of perfectionism and provided further evidence of the maladaptive nature of perfectionistic strivings and potential for the APS-R High Standards subscale to be more reflective of tapping into a healthy high standard rather that striving for perfection. This chapter yielded significant advances in the perfectionism literature and was submitted for publication to *Behaviour Research and Therapy.*

To prevent the repetition of content, the contents of **Chapter 5** summarised the description, psychometric reliability and construct validity of the measures that were consistently used throughout **Chapters 6-8** to measure constructs of interest. The measures were selected for their sound psychometric properties, outlined in detail in this chapter.

Informed by results found in the two reviews and meta-analyses, **Chapter 6** was an exploratory investigation utilising a convenience sample (282 students aged 13-15 years) to examine the factor structure across the most commonly used measures of perfectionism in order to determine the optimal structure for adolescents, and to identify whether the High

Standards subscale from the APS-R is better understood as a factor separate from perfectionistic strivings. Using both exploratory and confirmatory factor-analytic techniques, this study found preliminary evidence to suggest a better model fit for a 3-factor model (Perfectionistic Concerns, Perfectionistic Strivings, High Standards) compared to a traditional 2-factor model (Perfectionistic Concerns, Perfectionistic Strivings), with factorial invariance observed between males and females. Moreover, comparing two bi-factor models revealed removing the High Standards factor from a general Perfectionism factor marginally improved model fit, preliminarily indicating High Standards may be better understood as separate from perfectionism. Regression analyses also revealed the Perfectionistic Concerns factor had unique associations demonstrating impairments in well-being and intrinsic academic motivation, while the High Standards factor revealed unique positive associations with well-being. Perfectionistic Strivings was uniquely unrelated to outcomes (self-compassion, well-being, negative affect, intrinsic motivation). Despite significant methodological limitations detailed in this Chapter, this exploratory investigation evidenced a preliminary differentiation between perfectionism and high standards, with future research advocated in this area to solidify such conclusions. Following submission to *Psychological Assessment*, this paper was modified for the contents of this thesis to address methodological limitations identified by reviewers.

Finally, **Chapter 7** and **Chapter 8** feature two studies that turn to focus on the further development and evaluation of a universal perfectionism prevention program for young adolescents informed from the previous findings detailed above. **Chapter 7** details the results of a 3-lesson researcher-led pilot study based on the program detailed by Vekas and Wade (2017) using a convenience sample of gifted adolescents (N = 93, M_{age} = 13.59) in a randomised controlled trial format. **Chapter 8** builds on results from the pilot study, boosting the program to 5-lesson teacher-led program in a sample of universal adolescents (N = 636,

M_{age} = 13.68), with a focus on striving for high standards versus perfection, and cultivating self-compassion instead of self-criticism in the face of failure. To measure outcomes of perfectionism, the Discrepancy subscale from the APS-R was utilized for perfectionistic concerns, while the High Standards subscale represented high standards. **Chapter 8** also included the Personal Standards subscale from the FMPS, and the short-form Self-Oriented Perfectionism subscale from the HMPS, to measure perfectionistic strivings. Other outcomes of interest in evaluating the program included well-being, negative affect, self-compassion, and academic intrinsic motivation. Despite the results from **Chapter 7** (decreases in perfectionistic concerns, maintenance of high standards, increases in self-compassion), results from the 5-lesson teacher-led perfectionism program revealed no differences in perfectionism or other outcomes between the intervention and control group. However, at 3-month follow-up, anxiety showed an increase in the control group while appearing stable in the intervention group (d = 0.23; 95% CI: 0.05, 0.40). Main effects of time indicated students' well-being, depression, perfectionism and motivation significantly worsened over the school year. These findings illustrate the intervention may be useful in preventing the increase of anxiety in young adolescents, but teacher-led programs may not be an ideal mode of dissemination for targeting perfectionism. The results of these two chapters were combined into a single paper, submitted for publication in *Behaviour Research and Therapy*.

Chapter 9 presents an overall summary and synthesis of findings detailed in this dissertation, with an aim to integrate these novel research findings by exploring the common themes extracted from the results found, as well as limitations and general future directions for research.

A Note on Structure and Presentation of the Dissertation

All studies presented in this thesis have been published or submitted to peer-reviewed journals, with the recommended changes from reviewers implemented into each chapter.

Chapter 4, **7** and **8** were submitted to *Behaviour Research and Therapy*, and **Chapter 6** submitted to *Psychological Assessment*. For this reason, repetition of content, while minimised, is required for the Introduction sections within these chapters as a means for justifying the aims of the study. In a similar vein, Discussion sections for these chapters may also repeat similar underlying themes with regard to evidence for ongoing research focusing on the differentiation between perfectionism and high standards. All Tables and Figures can be found within the main body of each Chapter prior to the reference section. All references are presented collectively at the end of **Chapter 9.** Appendices can be found in **Chapter 10** following the integration and summary of findings section (**Chapter 9**).

Chapter 2

Literature Review

Overview

Factor-analytic evidence across multiple studies and measures has established two dimensions of perfectionism; perfectionistic concerns and perfectionistic strivings (e.g., Frost et al., 1993). However, the complexity of this construct is illustrated by little uniformity in the way perfectionism is measured and conceptualised in the research, despite the significant expansion of perfectionism research in the last three decades. This complexity has led to confusion with regards to whether perfectionistic strivings are adaptive (i.e., Stoeber & Otto, 2006) or not (Flett & Hewitt, 2014). Emerging evidence suggests more research is needed to distinguish perfectionistic strivings from high standards to better understand the differential impacts of both (Gaudreau, 2019). This introductory chapter will summarise five areas of research on perfectionism in order to set the context for the current thesis: first, conceptualisations and existing models; second, the relationship between perfectionism with mental health and academic outcomes; third, justification of further investigation of the differentiation between perfectionistic strivings and high standards; fourth, a review of interventions for perfectionism, including universal prevention, and fifth, possible mechanisms that can inform future model development with the aim of better understanding of the development of a complex intervention to reduce perfectionism (Medical Research Council, 2019), namely self-compassion and self-criticism.

The Conceptualisations of Perfectionism and Existing Models

History of the Perfectionism Construct

Perfectionism was originally described as unidimensional in nature (Burns, 1980), and considered a complex phenomenon that generally produces dysfunctional consequences. Alfred Adler (1938-1998) was one of the earliest psychologists who first wrote about perfectionism and considered it to be an innate but dysfunctional part of psychological life, describing perfectionists as “perpetually comparing themselves with the unattainable ideal of

perfection, and are always possessed and spurred on by a sense of inferiority" (Adler, 1956, p. 35-36). Other theorists reinforced this viewpoint, with psycho-analyst Karen Horney describing perfectionism as harmful and "the tyranny of the should" (Horney, 1950, p. 64). In 1978, Hamacheck was the first to suggest that two forms of perfectionism should be recognised, one of which he labelled "normal perfectionism" such that those high in striving for perfection enjoyed this pursuit with no repercussions, while "neurotic perfectionism" referred to those who suffered from their pursuit of perfection.

Introduction of Multidimensional Perfectionism

From the 1990s new measures of perfectionism embraced a multidimensional perspective (Frost et al., 1990; Hewitt & Flett, 1991). In 1990, Frost and colleagues identified six dimensions of perfectionism in their multidimensional model and associated measure (Frost Multidimensional Perfectionism Scale; FMPS): Personal Standards, Concerns Over Mistakes, Doubts About Actions, Parental Expectations, Parental Criticism, and Organisation. Personal Standards capture the extent to which perfectionists set exceedingly demanding high standards of performance for themselves. Concerns Over Mistakes refers to the tendency for perfectionists to fear making mistakes and negatively attribute their failures to their sense of self-worth, while Doubts About Actions reflects uncertainty about making decisions for fear of making an incorrect choice. Parental Expectations and Parental Criticism are often seen as antecedents or developmental precursors for perfectionism rather than core personality features (Frost et al., 1991) and refer to the perceived criticism and excessive expectations of perfection that parents may set for their children. Finally, Organisation refers to the tendency for perfectionists to value a sense of order and neatness but was seen to not correlate with the perfectionism model and is often excluded from being regarded as a core dimension of perfectionism (Frost et al., 1990).

Later that year, Hewitt & Flett (1991) published their measure of perfectionism (Hewitt Multidimensional Perfectionism Scale; HMPS) containing three dimensions and reflecting a psycho-analytic framework: Self-Oriented Perfectionism, Socially Prescribed Perfectionism, and Other-Oriented Perfectionism. Self-Oriented Perfectionism captures the extent to which perfectionists set personally exceedingly high goals, while Socially Prescribed Perfectionism refers to the extent to which one feels pressured by others to be perfect. Other-oriented perfectionists expect others around them to prescribe to perfectionism (Hewitt & Flett, 1991, 2004).

Since these two measures were introduced, numerous multidimensional measures of perfectionism have been published, all with varying dimensions driven by differing conceptualisations of perfectionism, with up to nine dimensions identified through a factor analysis (Stairs et al., 2012). One of the most common measures in the literature, apart from the FMPS and HMPS, is the Almost Perfect Scale-Revised (APS-R; Slaney et al., 2001) consisting of three dimensions of perfectionism: High Standards, Discrepancy, and Order. High Standards refer to the extent that individuals have high expectations of themselves, while Discrepancy captures the feelings of criticism when one's standards are not met. Similar to Frost et al.'s (1990) Organisation dimension, Order refers to the propensity to which perfectionistic individuals prefer Organisation and neatness.

The 2-factor Model

Despite the varying descriptions and dimensions of perfectionism captured by different researchers of varying theoretical persuasions, factor-analytic evidence suggests the various subscales across perfectionism measures are most commonly grouped under two higher-order dimensions; called perfectionistic strivings and perfectionistic concerns (Bieling et al., 2004; Cox et al., 2002; Enns & Cox, 2002; Frost, et al., 1993; Suddarth & Slaney, 2001). Perfectionistic strivings refer to the propensity to set self-oriented excessive and

demanding high personal standards, whilst perfectionistic concerns relate to extremely critical self-appraisals following failure, concerns over making mistakes, and feelings of Discrepancy between one's expectations and perceived performance (Cox et al., 2002).

Indeed, this 2-factor model was first identified by Frost and colleagues (1993) who examined the nine dimensions across the FMPS and HMPS in a sample of community adults, with two higher-order factors emerging from their analyses: Factor 1 labelled perfectionistic strivings (Personal Standards, Organization, Self-Oriented Perfectionism, Other-Oriented Perfectionism) and Factor 2 referred to as perfectionistic concerns (Concerns Over Mistakes, Doubts About Actions, Parental Expectations, Parental Criticism, and Socially Prescribed Perfectionism). Perfectionistic strivings were found to be positively related with positive affect (r = .24) and unrelated with depression (r = -.09) and negative affect (r = .09), while the opposite relationship was found when examining the association with perfectionistic concerns, holding positive relationships with depression and negative affect, while being unrelated to positive affect (positive affect, r = -.08; depression, r = .31, negative affect r = .29). Thus, Frost et al. (1993) coined perfectionistic strivings as 'positive' and perfectionistic concerns as 'maladaptive' – a practice which led researchers to begin to label evaluative connotations to the two perfectionism factors (e.g., adaptive and maladaptive perfectionism, healthy and unhealthy perfectionism; Stoeber, 2018). However, criticism has followed the 'adaptive' label of strivings (Hewitt & Flett, 2006).

Since the work of Frost et al., (1993) other notable studies (i.e., Bieling et al., 2004; Cox et al., 2002; Clara et al., 2007; Smith & Saklofske, 2017) have since evidenced support for a two-factor structure of perfectionism using varying combinations of subscales across the most commonly used perfectionism measures (i.e., FMPS, HMPS, APS-R) as well as other multidimensional measures of perfectionism. This has led researchers to use varying combinations of subscales in order to measure the two respective dimensions, with little

uniformity in how perfectionism is measured from study to study (Stoeber & Otto, 2006). It should be noted that since the work of Frost and colleagues (1993), research has generally excluded the subscales of Other-Oriented Perfectionism, Parental Expectations, Parental Criticism, Organization and Order from the core definitions of the two-factor model. Parental Expectations and Criticism are viewed as antecedents of perfectionism rather than components of individually driven perfectionism (Damian et al., 2013). Both Organization and Order are commonly excluded due to unclear findings on the classification with both subscales in the 2-factor model; Organization was not correlated with the original model of perfectionism, (Frost et al., 1993), while Order displays inconsistencies with regard to its association with helpful and unhelpful outcomes (Slaney et al., 2001) and both have been found to represent additional third factor of perfectionism called Order/Organization in factor-analytic studies (i.e., Kim et al., 2015; Suddarth & Slaney, 2001; Wang & Zhang, 2017). Other-Oriented Perfectionism has also generally been regarded as separate from individually driven perfectionism due to the directed focus of perfection on others rather than the self (Stoeber, 2015, 2018).

Taken together, work in the perfectionism literature has generally combined subscales across the three measures for the traditional 2-factor model of perfectionistic strivings (i.e., Personal Standards, Organisation, High Standards, Order, and Self-Oriented Perfectionism) and perfectionistic concerns (i.e., Concern Over Mistakes, Doubts About Actions, Discrepancy, Socially Prescribed Perfectionism, Parental Expectations and Parental Criticism; Bieling et al., 2004; Cox et al., 2002; Clara et al., 2007; Frost et al., 1993; Suddarth & Slaney, 2001). **Table 2.1** lists all published factor-analytic studies using multiple measures of perfectionism to examine higher-order strivings and concerns. As can be seen, 12 of 25 studies (48%) support a 2-factor model, four (16%) support a 3-factor model, another four support a 4-factor model, with the remaining five studies supporting models with six or more

factors. To assess the fit of proposed models, goodness-of-fit indicators are reported in research, with the root mean square error of approximation (RMSEA) value, or comparisons to baseline model values such as the Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) considered as the most appropriate for one-time analyses (Schreiber al., 2006). For model fit to be considered acceptable, it is recommended for root mean square error of approximation RMSEA benchmarks to be around <.06 for categorial or continuous data (<.08 considered marginal), Goodness of Fit (GFI) values of >.9, and CFI and TLI values of >.95 (Hu & Bentler, 1999; Schrieber, 2006). As can be seen two studies that explicitly investigated a 2-factor model achieved RMSEA of <.06 (Cox et al., 2002; Smith & Saklofske, 2017), while others reported report RMSEA values >.10 (i.e., Bieling et al., 2004; Clara et al., 2007; Dunkley et al., 2012; Kim et al., 2015; Zhang & Cai, 2012), or GFI Index values of >.9 (Blankstein et al., 2008; Dunkley et al., 2003; Rice et al., 1998;). Moreover, only four studies report CFI values greater than .95. Hence, many studies do not meet acceptable standards of model fit (see Bentler, 1990; Schreiber et al., 2006).

Table 2.1

Summary of all Factor Analyses Conducted using Perfectionism Measures

Authors	Sample Type	Model of Choice	Measures	Factors Identified in Model of Choice	Model Fit Statistics		
					RMSEA	CFI	TLI (GFI)
Bieling et al. (2004)	Undergraduate students	2-factor	HMPS (SOP, SPP, OOP) FMPS (CM, DA, PStan, ORG, PC, PE)	1. Strivings (SOP, PStan, ORG, OOP) 2. Concerns (CM, DA, PC, PE, SPP)	.10	NR	NR (.93)
Blankstein et al. (2008)	Undergraduate students	6-factor[2]	FMPS (CM, DA, PStan) HMPS (SOP, SPP) APS-R (HS, DIS)	1. Strivings (PStan, SOP, HS) 2. Concerns (CM, DA, SPP, DIS)	NR	.92	NR (.84)
Clara et al. (2007)	Clinical Sample (depression)	2-factor	HMPS (SOP, SPP) FMPS (CM, DA, Pstan, ORG) DEQ (SC)	1. Strivings (SOP, PStan, ORG) 2. Concerns (CM, DA, SPP, SC)	.13	.92	NR (.93)
Cox et al (2002) Sample 1	Undergraduate college students	2-factor	HMPS-SF (SOP, SPP) FMPS-SF (CM, DA, ORG, PC)	1. Strivings (SOP, PStan, ORG) 2. Concerns (CM, DA, PC, SPP)	.06	.91	.90
Cox et al. (2002) Sample 2	Clinical sample (depression)	2-factor	HMPS (SOP, SPP) FMPS (CM, DA, ORG, PStan, PC)	1. Strivings (SOP, PStan, ORG) 2. Concerns (CM, DA, PC, SPP)	.06	.79	.78
Cox et al. (2002) Sample 2	Clinical sample (depression)	2-factor	HMPS-SF (SOP, SPP) FMPS-SF (CM, DA, PStan, ORG, PC)	1. Strivings (SOP, PStan, ORG)	.06	.91	.90

[2] 6-factor model based on additional factors in the model: self-esteem, personal concerns, academic concerns, and estimated GPA

Cox et al. (2002) Sample 3	Undergraduate college students	2-factor	HMPS (SOP, SPP) FMPS (CM, DA, ORG, PC)	2. Concerns (CM, DA, PC, SPP) 1. Strivings (SOP, PStan, ORG) 2. Concerns (CM, DA, PC, SPP)	.06	.81	.80
Dunkley et al. (2012)	Community Sample & Undergraduate students	2-factor	HMPS (SOP, SPP) FMPS (CM, DA, Pstan) APS-R (HS, DIS)	1. Strivings (SOP, PStan, HS) 2. Concerns (CM, DA, SPP, DIS)	.10	.94	NR (.95)
Dunkley et al. (2000)	Undergraduate students	7-factor	HMPS (SOP, SPP) FMPS (CM, DA, PStan)	1. Strivings (SOP, PStan) 2. Concerns (CM, DA, SPP)	NR	.91	NR (.87)
Dunkley et al. (2003)	Undergraduate students	9-factor[3]	FMPS (CM, DA, PStan) HMPS (SOP) DEQ (SC)	1. Strivings (PStan, SOP) 2. Concerns (Self-critical; CM, DA, SC)	NR	.91	NR (.80)
Frost et al. (1993)	Undergraduate students	2-factor	HMPS (SOP, SPP, OOP) FMPS (CM, DA, ORG, PStan, PC, PE)	1. Strivings (PStan, SOP, OOP, ORG) 2. Concerns (CM, DA, SPP, PE, PC)	NR	NR	NR
Kim et al. (2015)	Undergraduate students	3-factor	FMPS (CM, DA, PStan, ORG) APS-R (HS, DIS, ORD)	1. Strivings (HS, PStan) 2. Concerns (DIS, CM, DA) 3. Order (ORD, ORG)	.12	.96	NR
Pearson & Gleaves (2006)	Undergraduate students	6-factor[4]	FMPS (CM, DA, Pstan, PC, ORG) APS-R (HS, DIS, ORD)	1. Strivings (Normal; PStan, HS) 2. Concerns (Neurotic; CM, DA, DIS, CM, NPQ) 3. Order (ORG, ORD)	.06	.98	NR (.90)

[3] 9-factor model based on additional factors in the mode: hassles, avoidant coping, event stress, perceived social support, problem-focused coping, negative affect, and positive affect.

[4] 6-factor model based on additional factors in the model: self-esteem, body dissatisfaction, and bulimic behaviour

Rice et al. (1998)	Undergraduate students	4-factor[5]	FMPS (CM, DA, PStan, ORG, PC, DA) APS (STA, REL, ANX, PRO) HMPS (SOP, SPP)	1. Strivings (PStan, ORG, STA) 2. Concerns (CM, DA, PC, PE, REL, ANX, PRO)	NR	.92	NR (.89)
Rice et al. (2005)	Undergraduate students	4-factor	FMPS (CM, DA, PStan, PE PC, ORG) APS-R (HS, DIS, ORD)	1. Strivings (PStan, HS) 2. Concerns (CM, DA, DIS) 3. Order (ORG, ORD) 4. Social Influences (PE, PC, SPP)	NR	.88	NR
Sironic & Reeve (2015)	High School Students	4-factor	FMPS (CM, DA, PStan, ORG PC, PE) CAPS (SOP, SPP) APS-R (HS, DIS, ORD)	1. Strivings (SOP, PStan, HS) 2. Concerns (CM, DA, DIS) 3. External Pressures (PE, PC, SPP) 4. Order (ORG, ORD)	.06	.90	.90
Slaney et al. (1995)	Undergraduate students	2-factor	HMPS (SOP, SPP, OOP) FMPS (CM, DA, PStan, ORG, PC, PE) APS (STA, REL, ANX, PRO)	1. Strivings (SOP, PStan, STA, ORG) 2. Concerns (CM, DA, PC, PE, REL, ANX, PRO)	NR	NR	NR
Smith & Saklofske (2017)	Undergraduate students	2-factor (bi-factor)	HMPS-SF (SOP, SPP, OOP) FMPS-SF (CM, DA, PStan) APS-R (HS, DIS, ORD)	1. Strivings (SOP, PStan, HS, ORD) 2. Concerns (SPP, CM, DA, DIS, OOP)	.05	.99	.98
Smith et al. (2016) Sample 1	Canadian undergraduate students	2-factor	HMPS-SF (SOP, SPP) FMPS-SF (CM, DA, PStan) EDI (SOP)	1. Strivings (HMPS-SOP, PStan, EDI-SOP) 2. Concerns (CM, DA, SPP)	.08	.94	.91

[5] 4-factor model based on additional factors in the model: self-esteem and depression

Smith et al. (2016) Sample 2	Chinese undergraduate students	2-factor	HMPS-SF (SOP, SPP) FMPS-SF (CM, DA, PStan) EDI (SOP)	1. Strivings (HMPS-SOP, PStan, EDI-SOP) 2. Concerns (CM, DA, SPP)	.07	.95	.92
Stairs et al. (2012)	Undergraduate students	9-factor	FMPS APS-R (HS, DIS) HMPS (SPP, OOP) AMPS (AP, MP) HEXACO SCANS PANPS (PP, NP) PCI NPQ BPS DEQ (SC) EDI (SOP) PQ	1. Order (ORG, ORD) 2. Satisfaction (AP, PP) 3. Details/Checking (HEXACO, MP) 4. Perfection Towards Others (OOP) 5. High Standards (SCANS, EDI-SOP, PP, PCI, HS) 6. Black/White Thinking (NP, EDI-SOP, PQ, BPS) 7. Perceived Pressure (SPP, NPQ, NP) 8. Dissatisfaction (NPQ, DIS, DEQ-SC, NP) 9. Reactivity to Mistakes (NPQ, MP, BPS)	.04	.90	.90
Stornæs et al. (2019)	High school students	4-factor	CAPS (SOP, SPP) FMPS (CM, DA, PStan, ORG, PE, PC)	1. Strivings (SOP, PStan) 2. Concerns (CM, DA) 3. External Pressures (PE, PC, 4. Order	.06	.80	.79
Suddarth & Slaney (2001)	Undergraduate students	3-factor	HMPS (SOP, SPP, OOP) FMPS (CM, DA, PStan, ORG, PC, PE) APS-R (HS, DIS, ORD)	1. Strivings (Pstan, SOP, HS, OOP) 2. Concerns (CM, DA, DIS, SPP, PE, PC) 3. Order (ORG, ORD)	NR	NR	NR
Wang & Zhang (2017)	Undergraduate students	3-factor	HMPS (SOP, SPP) FMPS (CM, PE)	1. Strivings (SOP, HS)	.07	.93	NR (.92)

			APS-R (HS, DIS, ORD)	2. Concerns (SPP, CM, PE, DIS) 3. Order (ORD)			
Zhang & Cai (2012)	Undergraduate students	3-factor	HMPS (SOP, SPP) FMPS (CM, DA, Pstan, PE, ORG) APS-R (HS, DIS, ORD)	1. Strivings (SOP, PStan, HS) 2. Concerns (Disc, SPP, CM, DA, PE) 3. Order (ORD, ORG)	.10	.90	.88

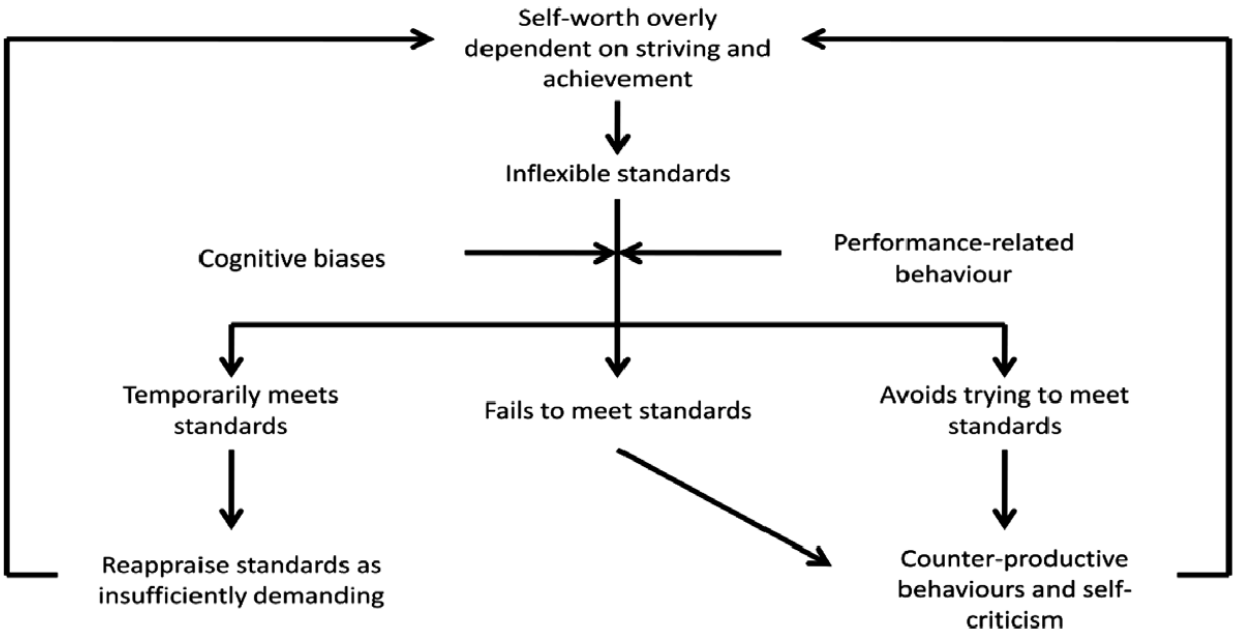
Note. RMSEA = root- mean-square error of approximation, CFI = comparative fit index, TLI = Tucker-Lewis index, GFI = goodness-of-fit index, FMPS = Multidimensional Perfectionism Scale (Frost et al., 1990), FMPS-SF = Short Form of the Multidimensional Perfectionism Scale (Cox et al., 2002), HMPS = Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), HMPS-SF = Short Form of the Multidimensional Perfectionism Scale (Cox et al., 2002), CAPS = Child and Adolescent Perfectionism Scale (Flett et al., 2001), APS-R = Almost Perfect Scale-Revised (Slaney et al., 2001), AMPS = Adaptive/Maladaptive Perfectionism Scale (Rice & Preusser, 2002), DEQ= Depressive Experiences Questionnaire (Blatt et al., 1976), BPS = Burns Perfectionism Scale (Burns, 1980), NPQ = Neurotic Perfectionism Questionnaire (Mitzman et al., 1994), PQ = Perfectionism Questionnaire (Rheaume et al., 2000), PANPS = Positive and Negative Perfectionism Scale (Terry-Short et al., 1995), SCANS = Setting Conditions for Anorexia Nervosa Scale (Slade & Dewey, 1986), PCI = Perfectionism Cognitions Inventory (Hewitt et al., 2003), HEXACO = HEXACO Personality Inventory (Lee & Ashton, 2004), EDI = Eating Disorders Inventory-2 (Garner, 1991), PStan = Personal Standards, SOP = Self-Oriented Perfectionism, HS = High Standards, CM = Concern Over Mistakes, DA = Doubts About Actions, SPP = Socially Prescribed Perfectionism, DIS = Discrepancy, ORG = Organisation, ORD = Order, PE = Parental Expectations, PC = Parental Criticism, OOP = Other Oriented Perfectionism, AP = Adaptive perfectionism, MP = Maladaptive perfectionism, PP = Positive perfectionism, NP = Negative perfectionism, SC = Self-criticism

Existing Models of Perfectionism

Various models of perfectionism have been postulated in the literature to try to understand the mechanisms underpinning the relationship between perfectionism and psychopathology (the relationship of which will be summarised further below in the Consequences of Perfectionism section). The Clinical Perfectionism model (Shafran et al., 2002, 2010; see **Figure 2.1**) utilises a cognitive-behavioural framework to postulate that self-criticism mediates the relationship between 'clinical perfectionism' (e.g., basing unattainable standards of achievement entirely on one's self-worth) and psychopathology. The model focuses on individually driven perfectionism that can be targeted in interventions and therapy with individuals.

Figure 2.1.

The Revised Cognitive Behavioural Model of Clinical Perfectionism, reproduced with permission from Shafran et al. (2010)



Specifically, exceedingly high standards of performance derive from an individual's self-worth being entirely dependent on their accomplishments, and thus unattainable standards of perfection are pursued regardless of adverse consequences. Rigid beliefs are developed in an attempt to achieve these standards (e.g., 'I must be perfect in everything I do otherwise it is a failure'), which fuels an extreme fear of failure and influences behaviours that maintain the perfectionism, including procrastination, excessive meticulousness and repeated checking of work. Importantly, it is postulated that cognitive biases such as dichotomous thinking, discounting of successes and a propensity to focus on failures maintain an individual's process of self-criticism when evaluating their work and thus contribute to the development of psychopathology (i.e., low mood, anxiety; Shafran et al., 2002). The model has received criticism due to focusing on a one-dimension model of perfectionism (Hewitt et al., 2003), with subsequent factor analytic evidence of the measure supporting a 2-factor solution (Dickie et al., 2012; Egan et al., 2016; Shu et al., 2020; Stoeber & Damian, 2014). It should be noted, however, that research has supported predictions of the model. For example, perfectionistic individuals have been found to reset higher standards upon failure of a task (Stoeber et al., 2008). Other studies have found support for the presence of cognitive biases such as selective attention to failures in individuals high in perfectionistic concerns (Howell et al., 2016). Additionally, cognitive behaviour therapy for perfectionism (CBT-P) uses this framework to guide intervention strategies (Egan & Shafran, 2018), with treatment studies showing large decreases in perfectionism and also decreases in depression, anxiety and disordered eating (Lloyd et al., 2015; Robinson & Wade, 2021; Suh et al., 2019).

Additional work has highlighted the importance of self-criticism in perfectionism. Sidney Blatt's papers and case studies (1995, 2004) were pivotal in the theorization that the objective success of perfectionists did not prevent the destructiveness of perfectionism, such that high levels of self-criticism in such individuals lead to painful distress and suicide.

Moreover, Hewitt and Flett (1991, 1993, 2002) have addressed at length the role of self-criticism as a response prominently activated in times of stress and failure and is seen as a core characteristic of both perfectionistic strivings and perfectionistic concerns.

Other models of perfectionism focus on the interaction between perfectionistic strivings and perfectionistic concerns to explain different outcomes of perfectionism and classify individuals into 'subtypes' of perfectionism, such as the 2 × 2 model of dispositional perfectionism (Gaudreau & Thompson, 2010) and the tripartite model of perfectionism (Rice & Ashby, 2007). The tripartite model of perfectionism postulated by Rice and Ashby in 2007 differentiates three types of perfectionists: (a) adaptive (e.g., those high in perfectionistic strivings and low in perfectionistic concerns), (b) maladaptive (e.g., those high in both perfectionistic strivings and concerns), and (c) non-perfectionists (e.g., those who are low in both dimensions of perfectionism). Thus, the tripartite model of perfectionism posits that the presence of perfectionistic strivings exacerbates the harmful effects of perfectionistic concerns (Stoeber, 2012). Indeed, research has generally evidenced support for the tripartite model of perfectionism for psychopathological outcomes, such that those high in maladaptive perfectionism (i.e., both dimensions of perfectionism) have displayed higher levels of negative emotionality (Smith et al., 2015). Findings in the realm of sport and dance, however, are somewhat mixed, with comprehensive reviews noting little to mixed evidence for the tripartite model when examining outcomes focusing on sport and dance (Hill & Madigan, 2017).

The 2 × 2 model of dispositional perfectionism (Gaudreau & Thompson, 2010) is another person-centred model that postulates the two dimensions of perfectionistic strivings and perfectionistic concerns interact to distinguish four dispositional combinations within individuals: (a) personal standards perfectionism (high perfectionistic strivings and low perfectionistic concerns), (b) evaluative concerns perfectionism (low perfectionistic strivings

and high perfectionistic concerns), (c) non-perfectionism (low perfectionistic strivings and low perfectionistic concerns), and (d) mixed profile perfectionism (high perfectionistic strivings and high perfectionistic concerns), with pure evaluative concerns postulated as the most maladaptive subtype. In contrast to the tripartite model, the 2 x 2 model positions perfectionistic strivings as 'adaptive' in nature by minimising the harm of perfectionistic concerns when they arise (Stoeber, 2012). The 2 x 2 model of perfectionism has been extensively researched in the sport and dance literature, with recent studies supporting the model when examining both helpful and unhelpful sporting outcomes (Hill & Madigan, 2017; Mallinson-Howard et al., 2019). In other areas however, findings are somewhat mixed. There is evidence to suggest no significant differences between individuals high in mixed perfectionism and those high in evaluative concerns perfectionism with regard to psychopathological outcomes including depressive symptoms (Douilliez & Lefrèvre, 2011), negative affect (Cumming & Duda, 2012; Damian et al., 2014) and eating disorder symptoms (Esposito et al., 2019), suggesting high levels of perfectionistic strivings may not serve as a protective factor. Moreover, while a portion of studies have evidenced pure personal standards perfectionism are adaptive in nature (Gaudreau & Thompson, 2010; Hill, 2013), some studies have found no significant differences between pure personal standards perfectionism and mixed perfectionism with regard to levels of motivation and body dissatisfaction (Quested et al., 2014) and GPA level (Franche et al., 2012). Moreover, Inglés and colleagues (2016) found non-perfectionism was the most adaptive in terms of less school anxiety, while personal standards perfectionism and evaluative concerns perfectionism showed no significant differences, and mixed perfectionism was related to the most harm.

The Perfectionism Social Disconnection Model (PSDM; Hewitt et al., 2006) asserts that socially prescribed perfectionism (i.e., perceiving that others are demanding perfection of oneself) and more recently, self-oriented perfectionism (i.e., perceiving demanding perfection

for oneself), is linked with the social disconnection from other people, which ultimately makes it difficult to develop connections with others and contributes to psychopathological outcomes (Sherry et al., 2013). Research has found support for this explanatory model, with perfectionistic concerns and perfectionistic strivings both predicting increased depressive symptoms at follow-up through social disconnection (Rice et al., 2006; Smith et al., 2017, 2020). This perfectionism model has also been tested in youth, with results highlighting the importance of social disconnection in mediating the harmful effect of perfectionistic concerns on outcomes related to suicide (Roxborough et al., 2012), and eating disorders, depression, and anxiety (Magson et al., 2019).

In the same vein, the Comprehensive Model of Perfectionistic Behaviour (CMPB; see Hewitt et al., 2017) postulates that perfectionism is a multifaceted personality style with three major interacting components that manifest in various ways. The CMPB is comprised of the trait level (i.e., self-oriented, socially prescribed, and other-oriented perfectionism), interpersonal level (i.e., perfectionistic self-promotion, non-display of imperfection, and non-disclosure of imperfection), and self-relational level (i.e., one's inner dialogue that is centred on the need to be perfect). These components have all been evidenced to lead to various harmful outcomes, including various psychopathologies (e.g., depression, suicidal ideation, eating disorders), relationship difficulties (e.g., negative social interactions, marital challenges), and achievement difficulties (e.g., procrastination, fear of failure, burnout, underachievement; Hewitt, 2020). Importantly, Hewitt (2020) suggests that while the components are often described separately, the degree to which individuals may encompass any such component are variable between individuals, and thus there is no such observable 'prototypic perfectionist'. However, this review will focus solely on the trait level of the CMPB (i.e., strivings and concerns).

Perfectionism, Mental Health, and Academic Outcomes

Mental Health Outcomes and Well-Being

Substantial evidence suggests perfectionism to be an underlying transdiagnostic risk and maintaining factor for a broad array of psychopathologies (see Egan et al., 2011 for a review). The detrimental associations of perfectionistic concerns with various psychopathological outcomes have been well-established in the literature, with perfectionism sharing positive associations with anxiety disorders (Antony et al., 1998; Handley et al., 2014), depression (Huprich et al., 2008), eating disorders (Bardone-Cone et al., 2007; Kehayes et al., 2019) and suicidal ideation (Smith et al., 2018). Moreover, perfectionistic concerns have been found to predict psychological maladjustment over months (Rice et al., 2006) and years (Dunkley et al., 2006a; Mandel et al., 2015, Tobin & Dunkley, 2021). A meta-analytic review conducted by Limburg and colleagues (2017) also identified both dimensions of perfectionism, albeit to a lesser extent for perfectionistic strivings, to be positively related to various psychopathologies. Both dimensions of perfectionism have also been found to longitudinally predict higher depressive symptoms at follow-up (Bekes et al., 2015; Smith et al., 2016, 2021a).

There is still some debate and confusion about the relationship between perfectionistic strivings and clinically relevant outcomes. Traditionally labelled as ‘adaptive perfectionism’ (see Stoeber & Otto, 2006, for a review), perfectionistic strivings have shown positive associations with outcomes such as life satisfaction (Chang et al., 2004), positive affect (Molnar et al., 2006), lower levels of psychological distress (Mobley et al., 2005) and increased self-efficacy (Stoeber & Gaudreau, 2017). Meta-analyses have also reported perfectionistic strivings to be negatively related to burnout in all domains (Hill & Curran, 2016) and procrastination (Sirois et al., 2017). Longitudinal evidence combining subscales of the HMPS, FMPS and APS-R to measure perfectionistic strivings have also suggested

strivings do not predict outcomes of depression and anxiety (Dunkley et al., 2020; Moroz & Dunkley, 2019). Moreover, a portion of research in the sporting literature has found those high in perfectionistic strivings report better sporting performance (Hill et al., 2018).

Meta-analytic evidence suggests perfectionistic strivings has positive associations with a range of psychopathologies (Limburg et al., 2017) and suicidal ideation (Smith et al., 2018). Perfectionistic strivings have also been linked to workaholism (Stoeber et al., 2013), and meta-analyses have identified perfectionistic strivings to be positively related to cognitive and somatic anxiety in athlete populations (Hill et al., 2018), and predict increased depressive symptoms at follow-up (Bekes et al., 2015; Smith et al., 2016, 2020, 2021a). In a comprehensive review, both dimensions of perfectionism have been identified as transdiagnostic risk factors for a variety of mental health disorders (Egan et al., 2011) and therefore it is argued that it should be accordingly targeted in intervention work along with perfectionistic concerns.

Academic Outcomes

While perfectionism research has largely focused on the relationship with clinically relevant outcomes, an area of interest is the relationship perfectionism holds with successful learning and academic outcomes (Fletcher & Speirs-Neumeister, 2017; Rice et al., 2016). This area is crucial to consider in the context of young people spending most of their time in academic environments, and adolescence being a key period for the development of perfectionism (Flett et al., 2002). Generally, perfectionism is also thought to have an adverse impact on successful learning and academic performance (Fletcher & Speirs-Neumeister, 2017). A recent meta-analysis conducted by Madigan (2019) found that measures of perfectionistic concerns displayed a small negative relationship with academic performance (i.e., GPA, self-reported grades, $r+ = -.08$, 95% CI -.12, -.05), whilst measures of perfectionistic strivings shared a small positive association ($r+ = .24$, 95% CI .21, .41).

Perfectionistic concerns have been shown to be detrimental to a range of academic outcomes important for successful learning in the tertiary environment, such as increased levels of test anxiety (Arana & Furlan, 2016; Eum & Rice, 2011; Kavanagh et al., 2016), procrastination (Closson & Boutilier, 2017; Flett et al., 1992), burnout (Kljajic et al., 2017), and decreased levels of academic satisfaction and adjustment (Gaudreau & Thompson, 2010; Montgomery et al., 2017). Moreover, self-determination motivation theory as described by Deci and Ryan (2000) posits that individuals who experience greater intrinsic motivation engage in an activity out of desire or interest while individuals who are more extrinsically motivated engage in activities with the purpose to gain a desired outcome, such as a good mark or social approval. Research examining the relationship between perfectionism and academic self-determination in university students has found perfectionistic concerns to be associated with extrinsic motivation (i.e., non-self-determined motivation) for study (Miquelon et al., 2005; Stoeber et al., 2009). However, the association that perfectionistic strivings hold with academic outcomes is unclear. Generally, perfectionistic strivings have been mostly associated with outcomes indicative of academic success, including decreased procrastination (Sirois et al., 2017), and increased levels of academic engagement, academic satisfaction self-efficacy, and academic adjustment (Closson & Boutilier, 2017; Gaudreau et al., 2016; Hanchon, 2010).

There are, however, a few studies in which perfectionistic strivings have been associated with higher levels of academic stress (Flett et al., 2016), academic burnout (Nepon et al., 2016), procrastination (Montgomery et al., 2017) an absence of protective features from academic-related anxiety (Arana & Furlan, 2016; Cowie et al., 2018), and higher levels of career indecision and stress (Kang et al., 2019). To date, there has been no quantitative synthesis of relations between perfectionism and outcomes related to academic achievement using meta-analytic techniques. These are important to consider, as academic performance in

isolation is one piece of the puzzle with regard to successful learning and mental well-being for youth in academia, and as such, the understanding of perfectionism in relation to other academic variables including test anxiety, academic stress, academic self-efficacy and academic procrastination is warranted.

Perfectionism and Youth

Despite the known detrimental effects of perfectionism on mental health and academic achievement, research on perfectionism has generally focused on adult populations. However, in many respects, the existing literature on perfectionism and psychopathology in children and adolescents parallels the findings on perfectionism in adults. Higher levels of both dimensions of perfectionism have been linked with various psychopathologies including anxiety and depression (Essau et al., 2008; Hewitt et al., 2002; Stornelli et al., 2009), increased difficulties in achieving successful therapeutic outcomes for anxiety (Mitchell et al., 2013), increased risk of suicide (Jones et al., 2008), eating disorder symptomatology in adolescents (Vacca et al., 2020), decreased social functioning and feelings of isolation (Magson et al., 2019), and increased fear and sadness in children and adolescents (Stornelli et al., 2009).

In terms of academic outcomes, only Madigan's (2019) meta-analytic review described above has examined the overall association between academic performance and perfectionism, with no evidence of a moderating effect of academic level (i.e., primary versus secondary versus tertiary) on the positive relationship perfectionistic strivings holds with achievement and the opposite relationship of perfectionistic concerns. Indeed, the maladaptive nature of perfectionistic concerns with regard to other academic outcomes is well established, with studies evidencing associations with increased burnout and test anxiety (Abdollahi et al., 2016; Chang et al., 2016) and decreased levels of academic satisfaction (Gilman et al., 2005) and increased non-self-determined (i.e., extrinsic)

motivation (Chang et al., 2015). However, similarly seen in the work of tertiary students, the relationship that perfectionistic strivings hold with outcomes indicative of successful learning is mixed. Studies have indicated perfectionistic strivings is associated with less academic anxiety (Abdollahi et al., 2016; Shaunessy et al., 2011), less academic burnout (Chang et al., 2016) and increased levels of academic self-efficacy, intrinsic motivation, and satisfaction with work (Bong et al., 2014; Chang et al., 2015; Damian et al., 2017; Gilman et al., 2005; Mofield & Peters, 2018). However, other studies have linked perfectionistic strivings with increased academic stress (Flett et al., 2016) or no protection from outcomes such as test anxiety and procrastination (Bong et al., 2014).

Given the unhelpful impact of perfectionism, it is alarming to note that perfectionism has been found highly prevalent and widespread among youth. It is estimated that 25% to 30% of young people have characteristics parallel to those of perfectionism (i.e., self-criticism when personal standards are not met; Hawkins et al., 2006) with three out of ten adolescents in Australia classified as perfectionists with harmful outcomes (Sironic & Reeve, 2015). Perhaps most troubling, there has been a significant increase in perfectionism in youth over the last 20 years (Curran & Hill, 2019). Taken together with the detrimental effects of perfectionism on mental health, this signals the need for more intervention and prevention work to combat perfectionism in youth.

Differences in Perfectionism

Sex Differences

Little is known about the prevalence of perfectionism (Smith et al., 2021b) and whether it differs across sex (male and female) and what implications this may have for interventions. Perfectionism research is focused mostly on females (Smith et al., 2021b), or have disproportionate samples (i.e., more females than males) when examining differences between males and females (i.e., Riviere & Douilliez, 2017; Stoeber & Stoeber, 2009), which

limits the conclusions that can be drawn in an already limited research pool. In terms of differences in prevalence of perfectionism, findings are mixed. Some studies have reported a higher incidence of perfectionistic concerns in female college students compared to males (Rice et al., 2013), while other studies report higher levels of socially prescribed perfectionism in male children (Flett et al., 2016), and other evidence suggests no differences between males and females on mean levels perfectionism (Smith et al., 2019).

There are suggestions, however, that differences in the prevalence of perfectionism may depend on the domain assessed. For example, Haase et al. (2013) found that females tend to score significantly higher on perfectionism when asked about appearance and academic domains compared to males. Emerging evidence also suggests sex may play a role in the relationship between perfectionism and varying outcomes. For example, the effect of perfectionism on perceived career barriers were found to be mediated by efficacy in career-searching for males but not females (Gnilka & Novakovic, 2017). However, other studies have shown no moderating role on sex for academic achievement (Madigan, 2019) or procrastination (Sirois et al., 2017). Sex differences in the structure of perfectionism, particularly in young adolescents, is also yet to be fully understood (Leone & Wade, 2018). Two factor-analytic studies with young adolescents using multiple measures of perfectionism found no differences between the structure of perfectionism (Sironic & Reeve, 2015; Stornaes et al., 2019), which is consistent with studies that examine the factor structure of individual perfectionism measures (Parker & Stumpf, 1995). However, more research and nuanced analyses in this area are needed, especially to target universal interventions most effectively.

Gifted Youth vs. General Youth

Perfectionism research has often focused on young, gifted populations due to traditional beliefs suggesting that perfectionism is a prevalent trait in those who are

intellectually gifted (Silverman, 2013). Indeed, research indicates youth who are gifted are more likely become distressed in response to failure compared to non-gifted peers (Roberts & Lovett, 1994), and possess greater ability to achieve higher standards of performance (Mofield & Peters, 2018). Moreover, evidence suggests that when gifted children achieve high standards, it is perceived with little effort (i.e., Speirs Neumeister, 2004) and they receive external praise from their parents, thus promoting their self-worth being contingent upon achievement from an early age (Speirs Neumeister, 2018).

However, studies examining differences in the prevalence of perfectionism between gifted and non-gifted youth have yielded mixed findings. LoCicero and Ashby (2000) found significantly higher perfectionistic strivings in their sample of gifted students compared to general students, and significantly lower perfectionistic concerns, while Parker and Mills (1996) found significantly higher levels of perfectionistic concerns in gifted youth. A portion of studies investigating the prevalence of perfectionism in gifted students versus non-gifted students have evidenced no significant differences in levels of perfectionistic concerns (Guignard et al., 2012; Stornelli et al., 2009) or perfectionistic strivings (Parker et al., 2001; Parker & Mills, 1996). Hence, research has suggested there is insufficient evidence to support that perfectionism is more prevalent in gifted youth than with general youth (Rice & Ray, 2018; Speirs Neumeister, 2018). To address this, a meta-analysis conducted by Stricker and Colleagues (2020) using a sample of ten comparative studies found no significant differences in levels of perfectionistic concerns between gifted and non-gifted youth (g = -0.12), but perfectionistic strivings was elevated in those who were gifted (g = 0.33). This suggests perfectionism, and in particular perfectionistic concerns, is prevalent in youth regardless of intellectual ability, and thus both gifted and non-gifted students should be targeted in intervention work.

Clarifying Perfectionism: High Standards Vs. Perfectionistic Striving

Limitations of the 2-Factor Model

The two-factor structure of perfectionism remains as the most prominent theoretical conceptualization of perfectionism and can be considered as a conceptual framework that has guided all relevant existing models of perfectionism. Importantly, the two-factor structure originally posited researchers to classify perfectionism as 'adaptive' and 'maladaptive' based on evaluation of each dimension with various outcomes from the original Frost et al. (1993) factor-analysis (Lo & Abbott, 2013). Nevertheless, a number of issues arise within the literature, which warrant further investigation into the structure of perfectionism.

First, there is inconsistent model fit of the 2-factor perfectionism model in adults based on RMSEA benchmarks of <.06 for an adequate model fit, or Goodness of Fit (GFI) Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) benchmarks of < .95 (Hu & Bentler, 1999; Schreiber et al., 2006). As mentioned above, with a notable exception of Cox et al.'s (2002) study that identified a 2-factor model in a two different samples (RMSEA = .06), and Smith & Saklofkse's (2017) recent bi-factor approach that revealed a 2-factor model (RMSEA = .05), a large portion of factor-analytic studies do not meet acceptable standards of model fit (i.e., Ashby & Slaney, 1998; Bieling et al., 2004; Blankstein et al., 2008; Clara et al., 2007; Dunkley et al., 2003, 2012; Kim et al., 2015 ; Zhang & Cai, 2012), which warrants some further investigation into the structure of perfectionism.

Moreover, the number of factors identified varies depending on the number of measures included. The notable example here is a confirmatory factor analysis conducted by Stairs and colleagues (2012) across 14 perfectionism questionnaires which found no support for two-factor model. Rather, nine different dimensions of perfectionism were identified; five had low associations with depression (r =.01 to .07) and moderate associations with conscientiousness (r =.28 to .57), while four had significant associations with depression (r

=.31 to .60) and low associations with conscientiousness (r =.11 to .22). Factor analyses that include correlates of individually oriented perfectionism (e.g., parental perfectionism, Organisation, Socially Prescribed Perfectionism) also tend to identify more factors.

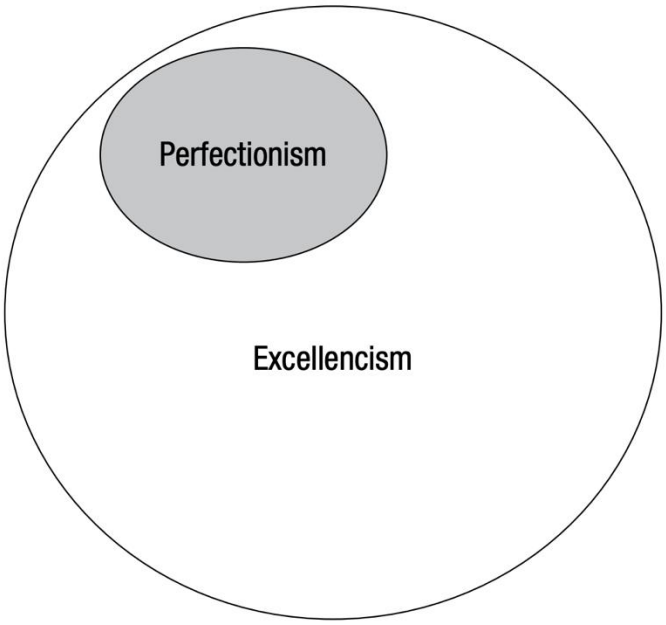
The existing literature on perfectionism in children and adolescents parallels the findings on perfectionism in adults, with similar consistency with respect to the traditional 2-factor structure (Leone & Wade, 2018). To the best of our knowledge, only two published studies have examined the factor structure across multiple perfectionism measures for young adolescents (Sironic & Reeve, 2015; Stornaes et al., 2019). Both studies identified a 4-factor model of perfectionism, retaining an Organisation Factor and External Pressures factor, with the remaining two factors representing perfectionistic concerns and perfectionistic strivings, respectively (RMSEA = .06). However, no studies to date have limited their factor-analytic investigation to individually oriented perfectionism in young adolescents, which is the core target of clinical interventions (Shafran et al., 2002).

A Third Factor?

One theoretical argument that has emerged to explain the mixed findings related to perfectionistic strivings and the inconsistent model fit is the confusion between measuring the pursuit of perfection versus the pursuit of excellence. Emerging theory suggests that perfectionistic strivings may be differentiated from a healthy pursuit of high standards, or what has also been referred to as “excellencism” (Gaudreau, 2019). For the purposes of this review, excellencism will be referred to as high standards to linguistically flow with the current standing literature. Gaudreau (2019) theorized the differentiation with high standards from perfectionistic standards is an important distinction to make in the perfectionism literature, with the two representing seemingly overlapping, but distinct constructs (see **Figure 2.2**). In other words, perfectionists may all strive for high standards within their pursuit for perfection, but not all who strive for high standards strive for perfection.

Figure 2.2

Symbolic Logic of the Difference Between High Standards (Excellencism) and Perfectionism, Adopted from Gaudreau (2019).



This theoretical distinction is important when considering the mixed findings for perfectionistic strivings, and the debate over whether some measures designed to assess perfectionistic strivings may be partially confounded with the construct of healthy high standards, which is unrelated to the core definition of perfectionism (Blasberg et al., 2016; Flett & Hewitt, 2002, 2006; Greenspon, 2000). Indeed, given varying combinations of measures are used to assess perfectionistic strivings in the literature, this argument may explain that the mixed findings with regard to perfectionistic strivings is due to the confusion between measures of the pursuit of perfection versus the pursuit of excellence (Flett et al., 2017; Gaudreau, 2019; Wade, 2018).

Preliminary evidence (Sherry et al., 2010) has shown that striving for excellence does, indeed, lead to increased work performance in direct comparison to the Self-Oriented Perfectionism subscale from the HMPS. Moreover, while the High Standards subscale from

the APS-R is considered to measure perfectionistic strivings (Rice et al., 2019), the wording is considered to be more consistent with a healthy pursuit of excellence and associated with helpful outcomes in young adolescents (Leone & Wade, 2018). Indeed, numerous studies have shown a positive association between this subscale and positive outcomes in children (Leone & Wade, 2018), including academic expectations, r = .29, and doing well in school, r = .27 (Gilman et al., 2010), global satisfaction, r =. 49 (Gilman & Ashby, 2003a), grade point average, r = .50, and personal adjustment, r = .49 (Gilman & Ashby, 2003b), and academic performance, r = .32 (Vandiver & Worrell, 2002). Moreover, in a notable study conducted by Blasberg and colleagues (2016), items from the APS-R were reworded to capture the all-or-nothing perfectionistic goals (i.e., changing "I set very high standards for myself" to "I set perfectionistic standards for myself") and found this amplified measure to be associated with unhelpful outcomes (depression and anxiety), while the original wording shared no negative relationships. Thus, it is plausible to suggest the wording of the high standards subscale from the APS-R to be reflective of a healthy pursuit of excellence rather than capturing perfectionistic strivings. Longitudinal research has also found that across the HMPS, APS-R, and FMPS, only the APS-R High Standards subscale uniquely predicts problem-focused coping (Prud'homme et al., 2017).

The use of various combinations of measures to assess the two dimensions of perfectionism, with little uniformity in the way in which perfectionism is measured (Stoeber & Otto, 2006), has resulted in a crucial need to distinguish between the pursuit of excellence as opposed to the rigid pursuit of perfection, with a new measure produced recently to achieve this goal (Scale of Perfectionism and Excellence; Gaudreau, 2019). Moreover, studies vary with the use of semi-partial correlations to control for the strong overlap between the two perfectionism dimensions, and it is commonly found that perfectionistic strivings are more strongly related to adaptive outcomes when residual perfectionistic concerns are

removed (i.e., Hill & Curran, 2016). However, a portion of researchers have argued against this method as it may remove the self-critical characteristic of the rigid striving for perfection, and ultimately promote more 'adaptive' outcomes (see Hewitt et al., 2017; Hill, 2014). This is important to consider, as ultimately in 'real life' contexts, it is likely individuals who rigidly strive for perfection will respond in a self-critical rather than compassionate way in times of stress or failure – which has been evidenced in experimental studies (Hill et al., 2011), and thus calls for a redundancy in ever calling perfectionistic strivings 'adaptive'. Ultimately, the measurement of perfectionistic strivings across different studies needs to be scrutinized and understood before conclusions about associations with outcomes can be made. However, to date, no research has formally investigated a factor structure that differentiates high standards and perfectionistic strivings.

Interventions for Perfectionism

Therapeutic Settings

The established harmful effects of perfectionism on psychopathology have made it critical to target this construct in interventions. Perfectionism interventions are largely based on a cognitive-behavioural framework (i.e., Shafran et al., 2002) and have been delivered in both face-to-face and internet formats to clinical populations to try to decrease perfectionism and various psychopathologies. To date, three meta-analyses have investigated the overall efficacy of these targeted programs. Lloyd et al. (2015) found that overall, targeted perfectionism interventions resulted in moderate reductions in anxiety and depression (g = 0.52, g = 0.64, respectively), eating disorder symptomatology (g = 0.32-3.96, based on one study) as well as large reductions in both perfectionistic concerns (g = 1.32) and perfectionistic strivings (g = 0.79-0.81). Similar results were found in Suh et al.'s (2019) updated meta-analysis that investigated the direct comparison between intervention and control groups in clinical samples (i.e., elevated perfectionism levels, obsessive compulsive

disorder diagnosis, eating disorder diagnosis), noting moderate decreases in perfectionistic strivings (g = -0.48), perfectionistic concerns (g = -0.55), as well as anxiety (g = -0.49) and depression (g = -0.62) resulting from the intervention. Finally, Robinson and Wade's (2021) systematic review and meta-analysis found perfectionism interventions in both clinical and non-clinical populations significantly reduced eating disorder symptoms compared to control groups (g =-0.64), as well as perfectionism (g = -1.28), depression (g = -0.45), and anxiety (g = -0.14). Similar results were found for studies with within-group effect sizes examining pre and post intervention effects (eating disorder symptomatology, g = -1.23; perfectionism, g = -0.91; depression, g = -0.61; anxiety, g = -0.41).

Two further intervention studies have examined alternative approaches to decreasing perfectionism. In their randomised controlled trial, James and Rimes (2018) investigated the efficacy of a mindfulness-based cognitive therapy (MBCT) approach versus pure self-help based on CBT in decreasing perfectionism for university students struggling with perfectionism. The MCBT group resulted in significant decreases in rumination and unhelpful beliefs and increases in mindfulness and self-compassion that were maintained at follow-up and superior to the self-help group. Moreover, at 10-week follow-up significant differences in perfectionism were observed between the two groups favouring the MBCT approach. However, the interventions were not matched for time and attention. A second study used a group format for the treatment of perfectionism, with the intervention informed by psychodynamic theory and interpersonal psychotherapy (Hewitt et al., 2015). Significant decreases in perfectionism, depression, and interpersonal difficulties were observed post-treatment, but these were compared with a non-randomised waitlist control group and thus limits conclusions that can be drawn due to the study design of choice. Hence, the current state of evidence supports CBT as the intervention of choice for perfectionism.

Universal Prevention

A recent meta-analytic review suggests perfectionism exists regardless of intellectual ability (Stricker et al., 2020), and paired with the linear increase in youth and prevalence of perfectionism in young people (Curran & Hill, 2019; Sironic & Reeve, 2015), there are calls for interventions to combat perfectionism universally across all youth using school-based prevention programs (Flett & Hewitt, 2014). Investigation of interventions explicitly targeting perfectionism in this format are scarce but promising (Morris & Lomax, 2014), with those conducted adopting a CBT framework (Arana et al., 2017; Fairweather-Schmidt & Wade, 2015; Nehmy & Wade, 2015; Vekas & Wade, 2017; Wilksch et al., 2008), utilising externally delivered interventions (i.e., not delivered by classroom teachers), and showing significant decreases (d = 0.35-1.34) in perfectionism over 4-week to 12-month follow-up. One study showed associated decreases in negative affect (Nehmy & Wade, 2015, d = 0.27) and another demonstrated improvement in well-being (Vekas & Wade, 2017, d = 0.33) at follow-up. This latter study included an intervention with a greater emphasis on the difference in pursuing excellence versus perfectionistic standards, and the usefulness in practising self-compassion rather than self-criticism as a way of encouraging perseverance in the face of difficulties (Gilbert, 2014).

These results in school-based interventions for perfectionism should be interpreted in the context of results for the effectiveness of universal based programs for combatting a range of mental health problems, where evidence shows larger effect sizes for targeted programs i.e., delivered to youth with elevated symptomatology (Arora et al., 2019; Werner-Seidler et al., 2017), but even here the effects may not be sustained at follow-up (d = 0.01-0.02, Spence et al., 2005). Evidence also suggests that externally delivered interventions have greater impact than those delivered by school staff (Werner-Seidler et al., 2017). A recent meta-analysis investigating the combined effect of school-based prevention programs on psychological stress found no overall significant effects for non-selected samples (B = 0.23,

95% CI = -0.10-0.57, van Loon et al., 2020). For depression and anxiety, the overall effect size for universal approaches is *g* =0.19 (Werner-Seidler et al., 2017), and non-significant findings at follow up between 3-48 months ranges between (*g* = 0.07-0.11; Ahlen et al., 2015). Other universal programs for depression and anxiety have shown no significant effects (Sawyer et al., 2010; Sheffield et al., 2006), including online programs delivered in class and supported by teachers, with or without the addition of a mental health education officer to support classroom teachers in the delivery of the program (Calear at al., 2016). As such, it has been concluded that there is currently no 'gold standard' approach for universal based prevention programs related to mental health in schools for psychopathology (Nehmy & Wade, 2014).

A New Model: Self-Compassion, Self-Criticism and Perfectionism

Given the detrimental associations with psychopathological outcomes, it is crucial to understand the risk factors that influence and exacerbate perfectionism in order to inform further intervention work. Even more so, it is helpful to understand the relationship perfectionism has with helpful psychological processes in order to inform intervention work to promote psychological well-being and provide an antidote to the self-critical cognitions that accompany perfectionism (Nehmy & Wade, 2014; Medical Research Council, 2019). Self-compassion may be a process of interest.

Self-compassion has been defined as a personality style and psychological process characterized by a compassionate, understanding and non-judgemental attitude toward oneself, experiencing kindness in the face of failure and personal shortcomings, and the recognition that one's inadequacies are only human (Neff, 2003). Extensive research has established self-compassion as a promising protective factor against a range of psychopathologies (MacBeth & Gumley, 2012; Marsh et al., 2017), whilst exhibiting strong associations with levels of well-being such as promotion of emotion regulation (Neely et al.,

2009), lower levels of psychological distress (Neff & McGehee, 2010; Van Dam et al., 2011) and protecting against eating and body image concerns (Braun et al., 2016; Turk & Waller, 2020). Decreased levels of self-compassion have also been linked with an increased vulnerability to mood disorders (Krieger et al., 2016). As evidence has suggested self-compassion acts as a buffer against various psychopathologies, research has begun to investigate the role self-compassion may play in clinical interventions. A recent meta-analysis suggests interventions aimed at increasing self-compassion led to improvement in eating behaviour, rumination, stress, depression, self-criticism, and anxiety (Ferrari et al., 2019). Self-compassion thus holds promise as a means of addressing psychological risk factors.

In contrast, self-criticism has been well-established as a personality trait implicated in a wide range of psychopathologies. Defined as the predisposition to set relentlessly demanding high standards and adopting a punitive attitude towards oneself once these standards are not met (Shahar, 2015a), a large body of evidence suggests self-criticism is associated with a range of mental health disorders including social anxiety (Shahar et al., 2015b), eating disorders (Fennig et al., 2008; Zelkowitz & Cole, 2018), and depression (Luyten et al., 2007) as well as indicators of psychological distress including non-suicidal self-injury (Fox et al., 2018; Perkins et al., 2019). Self-criticism has also been shown to impede treatment outcomes for those with depression (Marshall et al., 2008), increase the recurrence of depressive episodes (Mongrain & Leather, 2006) and longitudinally exacerbate multiple forms of disordered eating (Zelkowitz & Cole, 2020). Accordingly, research has begun to examine interventions specifically targeting self-criticism, yielding promising results (see Kannan & Levitt, 2013 for a review).

Self-compassion has been found to moderate the harmful effects of perfectionistic concerns on depressive symptoms (Abdhollai et al., 2020), and low levels of self-compassion

mediate the association between perfectionism (concerns and strivings) and depression (Ferrari et al., 2018; Mehr & Adams, 2016; Richardson et al., 2018), anxiety and emotion dysregulation (Fletcher, 2019) and subjective well-being (Stoeber et al., 2020). This suggests self-compassion may be an important mechanism by which perfectionism exerts maladaptive effects on psychopathology. Intervention work targeting perfectionism has also revealed decreases of perfectionism result in increases in self-compassion (James & Rimes, 2018; Rozental et al., 2017). The degree, however, to which self-compassion is associated with and impacts on perfectionism dimensions is yet to be clarified in a formal review.

Both perfectionism dimensions have displayed positive associations with self-criticism (Sherry & Hall, 2009). When examining self-criticism and perfectionistic strivings, it is the former that substantially accounts for the relationships with depression, anxiety, eating psychopathology (Dunkley et al., 2006b; Dunkley et al., 2006c) and compulsive exercise (Taranis & Meyer, 2010). Similar findings apply to the harmful effects of perfectionistic concerns on psychopathological outcomes such as depressive symptoms (Manfredi et al., 2016) and psychological distress (James et al., 2015). Whilst self-criticism is a facet of perfectionism, research shows that perfectionism predicts harmful effects on psychological maladjustment over and above self-criticism (Sherry et al., 2016) and thus should be understood as neither redundant with nor captured entirely by self-criticism.

A better understanding of the role self-compassion and self-criticism play in buffering, exacerbating and partially or fully explaining the mechanisms through which perfectionism impacts psychopathology can inform future model development work. This in turn will inform the development of complex interventions that can most effectively target perfectionism and hence psychopathology (Medical Research Council, 2019). To date, however, there has been no synthesis of the degree to which self-compassion and self-criticism are associated with, and impact on, perfectionism, and whether this supports

mediation or moderation. This work is critical in order to better understand processes that can be targeted in future intervention work for perfectionism.

Conclusions

Several conclusions can be drawn from this review. First, the broad array of adverse consequences of perfectionism (Limburg et al., 2017), its high prevalence (Sironic & Reeve, 2015), and linear increase in youth (Curran & Hill, 2009) indicates an urgency for rigorous examination of theoretical models in order to develop an understanding about the structure of perfectionism and how it impacts on adverse and helpful outcomes (Leone & Wade, 2018). In turn, this will allow more insight into developing effective universal prevention and intervention strategies with youth. Second, significant gaps in the literature remain whereby a clearer understanding of the construct of perfectionism is needed, particularly the differentiation of high standards versus perfectionistic strivings on academic and mental health outcomes via examining differences in measures commonly used in the literature – in order to move from the conceptualization of perfectionistic strivings as 'adaptive'.

This thesis will therefore focus on evidencing the differentiation of perfectionistic strivings subscales through meta-analytic and factor-analytic strategies, in order to inform a universal intervention program aimed at targeting perfectionism and cultivating high standards in young adolescents. In order to further investigate the differentiation, the next chapter will focus solely on clarifying the contribution of various perfectionistic concerns and perfectionistic strivings subscales on academic performance and outcomes indicative of academic success, using a meta-analytic approach.

Chapter 3

A Meta-Analytic Review on Perfectionism and Successful Learning[2]

[2]This section was published and can be found in Chapter 10 Appendix A. Ivana Osenk contributed 70%, 75%, and 79%, Paul Williamson contributed 10%, 20%, and 1%, and Tracey Wade contributed 20%, 5%, and 20% to the research design, data collection and analysis, and writing and editing respectively.

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Abstract

Confusion exists about the construct of perfectionism, considered to consist of perfectionistic strivings and perfectionistic concerns. Recent theory suggests that high standards is related to perfectionistic strivings but differentiated by having a more positive impact. To test this hypothesis, we used a meta-analytic analysis to examine the associations between different measures of perfectionism and academic outcomes. Correlations between academic measures (performance, academic burnout and stress, test anxiety, procrastination, self-efficacy, engagement, satisfaction, adjustment, hardiness, learning strategies) and subscales of the FMPS, HMPS, APS-R, and CAPS were investigated in students (M_{age} = 19.31, *SD* = 4.26). A systematic literature search yielded 67 studies (378 effect sizes). Subscales relating to standards (High Standards, Personal Standards, Self-Oriented Perfectionism) were positively related to academic performance and helpful academic outcomes. Only High Standards, which has a focus on striving for excellence, had negative associations with unhelpful academic outcomes. Two of the four subscales that measured perfectionistic concerns (Discrepancy, Doubts About Actions) were negatively related to academic performance, and Discrepancy shared a negative association with helpful academic outcomes. All perfectionistic concerns subscales were positively associated with unhelpful academic outcomes. As such, perfectionistic concerns are maladaptive for successful learning and a distinction between perfectionistic strivings and healthy striving for high standards is worth further exploration.

Introduction

A recent meta-analysis (Madigan, 2019) found perfectionistic concerns displayed a small negative relationship with academic performance (i.e., GPA, self-reported grades), while perfectionistic strivings shared a small positive association. However, the understanding of perfectionism in relation to other academic variables is warranted in order to glean a full picture of the role perfectionism plays in successful learning and mental well-being for youth in academia.

Perfectionistic concerns are known to hinder successful learning by holding relationships with increased levels test anxiety, procrastination, burnout, and decreased levels of academic satisfaction and adjustment (Abdollahi et al., 2016; Eum & Rice, 2011, Stoeber et al., 2009). Findings with respect to perfectionistic strivings are mixed, with many studies evidencing associations with outcomes indicative of academic success such as academic satisfaction and self-efficacy (Damian et al., 2017; Franche et al., 2012), while other studies demonstrating positive relationships with test anxiety (Bong et al., 2014) and academic stress (Flett et al., 2016). However, these findings are yet to be synthesized using meta-analytic techniques. Debate has also arisen as to whether perfectionism can ever be adaptive given its harmful relationship with psychopathology (Limurg et al., 2017), and evidence suggests certain subscales designed to tap into perfectionistic strivings may be partially confounded with the construct of striving for high standards, which is unrelated to the core definition of perfectionism (Blasberg et al., 2016).

Aims of the Meta-Analysis

The main aim of this meta-analysis was to investigate the relationship of subscales measuring perfectionistic strivings and perfectionistic concerns to both academic performance and academic outcomes related to achievement and successful learning (cognitive, emotional, and behavioral) across studies using meta-analytic techniques. We

examined measures across the FMPS (Frost et al., 1990), APS-R (Slaney et al., 2001), HMPS (Hewitt & Flett, 1991) and CAPS (Flett et al., 2016), with **Table 3.1** providing a summary of included subscales. This meta-analysis is the first quantitative synthesis of relations between perfectionism subscales and outcomes related to academic achievement and will attempt to investigate differentiation between perfectionistic strivings measures to identify perfectionism versus high standards. In turn, this will inform model development and allow future research better precision for developing effective prevention strategies with youth.

It was hypothesized that all perfectionistic concerns subscales would be negatively related to both academic performance and helpful academic outcomes, whilst being positively related to unhelpful academic outcomes. With respect to the perfectionistic striving subscales, we predicted these would be positively associated with academic performance, consistent with previous research (Madigan, 2019). However, consistent with previous evidence, we considered the wording of the High Standards subscale from the APS-R to be more consistent with pursuit of excellence than pursuit of perfection (Blasberg et al., 2016). It was therefore postulated that the Self-Oriented Perfectionism and Personal Standards subscales would have no association with either helpful or unhelpful academic outcomes, but the High Standards subscale would have positive associations with helpful academic outcomes and negative associations with unhelpful academic outcomes.

Table 3.1.

Scales Measuring Perfectionism with Classification of their Subscales into the Two Major Dimensions of Perfectionism.

Scale	Perfectionistic Concerns	Perfectionistic Strivings
Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990)	Concern Over Mistakes (CM): tendency to show negative reactions to mistakes and to interpret mistakes as a failure Doubts about actions (DA): concern that tasks have not been completed properly	Personal Standards (PStan): striving for high standards
Hewitt Multidimensional Perfectionism Scale (HMPS; Hewitt & Flett, 1991)	Socially Prescribed Perfectionism (SPP): tendency to expect others to have extremely high standards for him/her and to constantly evaluate him/her for what he/she achieves	Self-Oriented Perfectionism (SOP): tendency to set high standards for oneself while also reflecting the intrinsic motivation to reach those standards
Almost Perfect Scale-Revised (APS-R; Slaney et al., 2001)	Discrepancy (D): a sense of being discrepant due to having fallen short of expectations and one's standards	High Standards (HS): tendency to set high standards for oneself
Children and Adolescent Perfectionism Scale (CAPS; Flett et al., 2016)[a]	Socially Prescribed Perfectionism (SPP): tendency to expect others to have extremely high standards for him/her and to constantly evaluate him/her for what he/she achieves	Self-Oriented Perfectionism (SOP): tendency to set high standards for oneself while also reflecting the intrinsic motivation to reach those standards

[a] *Merged with HMPS*

Method

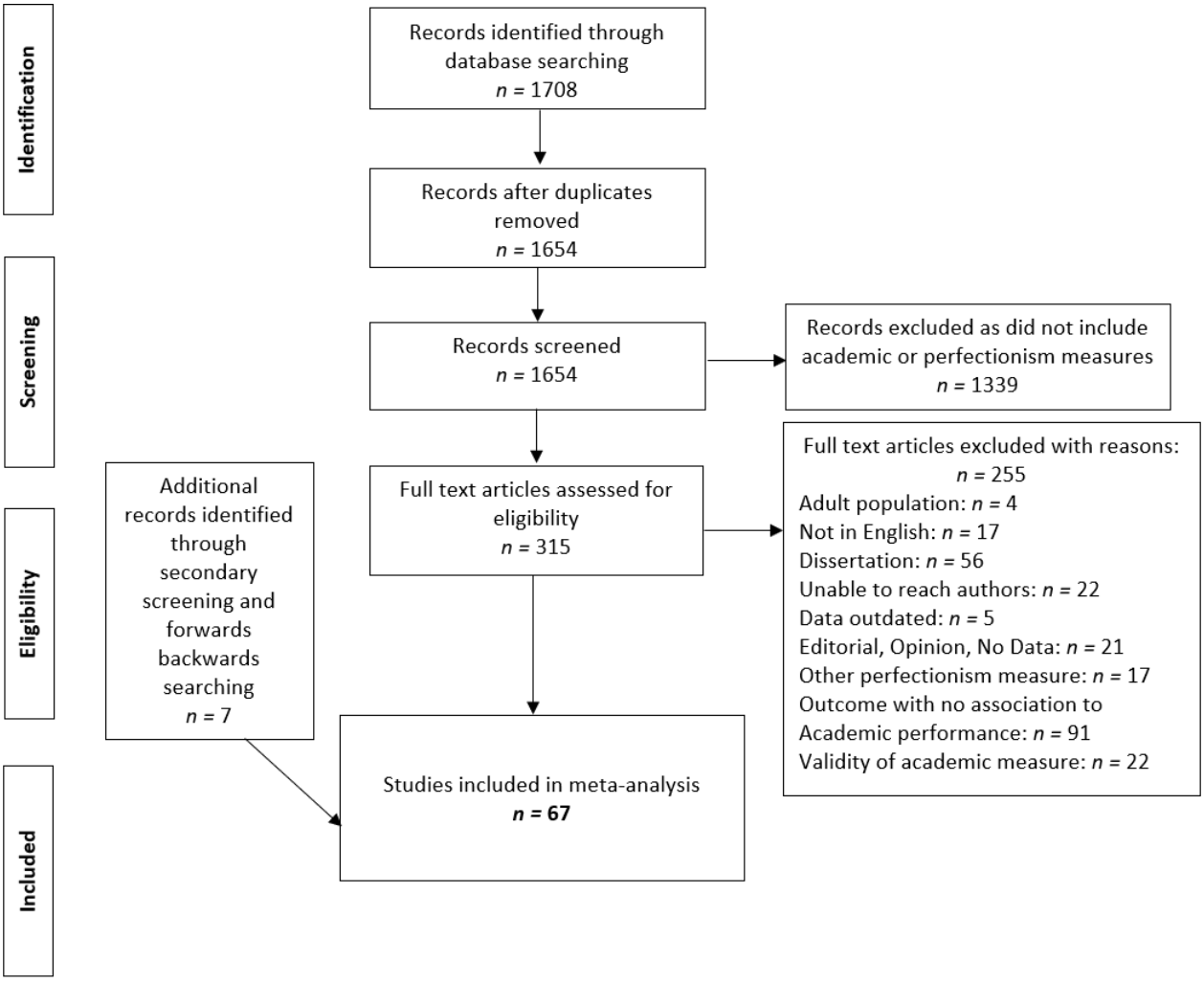
Search strategy

The review process was conducted according to the PRISMA statement (Moher et al., 2009, see **Figure 3.1**). Ethics approval was not needed. A literature search was conducted using PsycINFO, Educational Resource Information Centre (ERIC), Scopus and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) to locate studies investigating the relationship between perfectionism and outcomes indicative of academic achievement. The following keywords and Boolean search terms were combined and searched in the database: (*perfectionism* or *perfectionistic concerns* or *perfectionistic strivings* or *excellence*) AND *academic* or *achievement* or *learning* or *school* or *university* or *goals* or *motivation* or *burnout* or *procrastination* or *test anxiety*). The search was limited to peer-reviewed articles and articles only in English.

The search yielded 1,708 published studies listed in June 2018 and following the removal of duplicates, 1,654 remained. Titles and abstracts were screened, and studies that did not empirically examine perfectionism in academic settings were removed, resulting in examination of 315 full-text articles with 60 articles meeting inclusion criteria for data extraction. A final search utilizing all databases and forwards/backwards search was conducted on the 3rd April 2019, resulting in five additional studies. Two studies were found from a forwards/backwards search. When insufficient data was supplied within the study to extract effect sizes, authors were contacted (N = 33); 13 (39%) replied and nine provided additional data. In total, 67 studies were included in the analysis.

Figure 3.1.

PRISMA Diagram of the Selection Process of Studies Included in the Meta-Analysis.



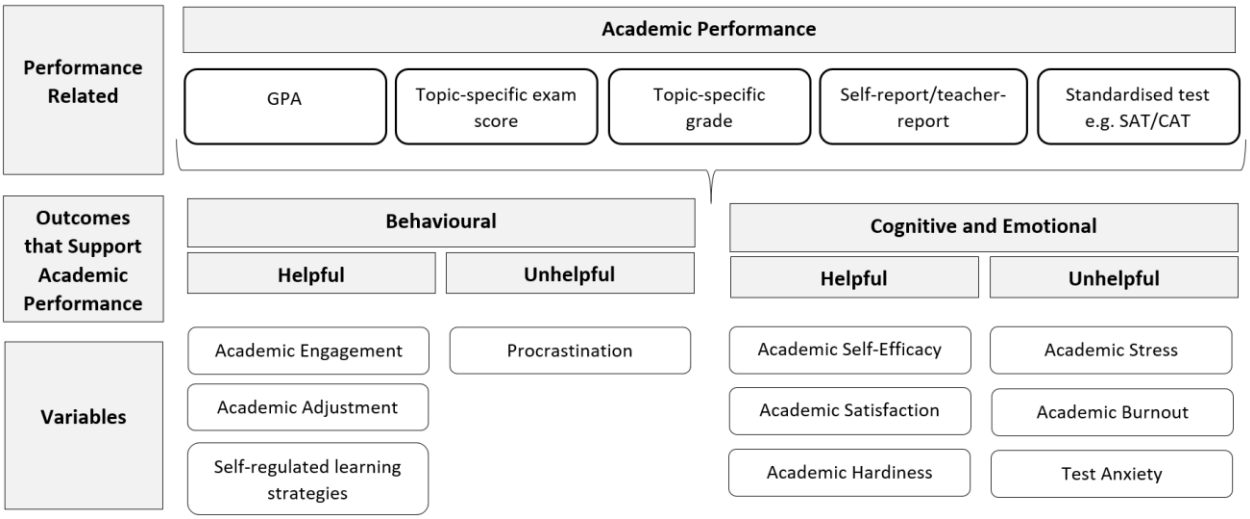
Relevant Outcomes

The most common measures of academic achievement were used as benchmarks, including grade point average, individual class performance (i.e., end of term grades) and individual test performance (i.e., exams). Additionally, self-reported GPA has been shown to be highly correlated with actual GPA (Kuncel et al., 2005) and was thus included. The literature contains a variety of academic-related outcomes indicative of academic performance, and as such, outcomes were classified into meaningful categories. Following an extensive search and consolidation of findings from existing literature regarding the

relationship between performance and academic outcomes (Fletcher & Speirs-Neumeister, 2017), three broad categories of outcome were identified: cognitive, emotional, and behavioral, which were further classified as either helpful or unhelpful (see **Figure 3.2**).

Figure 3.2.

List of Academic Outcomes Included in the Meta-Analysis



Perfectionistic Strivings and Perfectionistic Concerns Perfectionism

This review follows the recommendations of Stoeber and Otto (2006), and previous meta-analytic studies on perfectionism (e.g., Limburg et al., 2017; Hill & Curran, 2016) as a general guideline in classifying subscales into meaningful groups for analysis (see **Table 3.1**). As such, subscales from the two most common measures, the FMPS (Frost et al., 1990), and the HMPS (Hewitt & Flett, 1991) were used, in addition to the subscales of the APS-R (Slaney et al., 2001). The CAPS subscales, which were originally adapted from the HMPS to use in youth (Flett et al., 2016) were merged with the HMPS subscales due to their strong relationship, as demonstrated by previous factor-analytic studies (e.g., Bieling et al., 2004; Cox et al., 2002). Following recommendations from previous literature (Stoeber and Otto, 2006; Cox et al., 2002), FMPS-Organisation, HMPS-Other-Oriented Perfectionism, and APS-

R-Order were excluded from this review due to unclear findings on the classification of the two subscales. Moreover, FMPS-Parental Expectations and Parental Criticism were omitted as evidence suggests these do not relate to core aspects of perfectionism, but rather are preceding factors involved in upbringing (Stoeber & Otto, 2006).

Inclusion criteria

Studies were included if they measured both perfectionism and relevant academic outcomes using established, validated self-report scales. Restrictions were placed on study characteristics such that the participant pool should include child, adolescent and young adult or university-sample participants. All studies had to include an effect size (e.g., correlation coefficient), or the relevant information needed was obtained from the corresponding author. Studies were required to be peer-reviewed and published in English. Dissertations were excluded to avoid retrieving duplicate effect sizes. Studies that were excluded were identified as not eligible for the above reasons and appropriately coded as such (see **Figure 3.1**).

Study Identification

To determine study eligibility, the first author and an independent judge (both holding an Honours degree in psychology) examined titles and abstracts of identified studies using the inclusion-exclusion criteria described above. The initial agreement rate for inclusion between the two judges was 95%. Discrepancies were then resolved via a discussion-based approach to reach a consensus, with consultation from the third author. The first author assessed all remaining studies in full text and coded them.

Recorded Variables

A coding sheet was completed for each study by the first author in the full-text screening process. The coding sheet included: (a) publication information (authors/year), (b) sample size, (c) student's age (including mean and range), (d) instructional environment (primary, secondary, tertiary), (e) the instrument and subscale used to measure perfectionistic

concerns and perfectionistic strivings, (f) measure of academic achievement or outcome indicative of academic achievement, and (g) the bivariate correlations and 95% confidence intervals between the perfectionism subscale and academic outcome.

Statistical Methods

All relevant primary studies examining the relationship between a perfectionism subscale and the relevant academic outcome reported zero-order correlation coefficients, *r*. As such, the zero-order correlation coefficient was obtained and selected as the effect size metric. As such, all analyses were performed using Fisher's *Z* scale (Borenstein et al., 2009), with correlation coefficients being transformed using an online Practical Meta-Analysis Effect Size Calculator (http://www.campbellcollaboration.org/effect-size-calculato.html). Subsequently, Fisher's *Z* results were back-transformed to the appropriate correlation co-efficient and reported in order to ease interpretation. Cohen's (1992) recommendations were used to interpret small (r = .10), medium (r = .30), and large (r = .50) effects. Random-effects models are considered to allow generality beyond the present set of studies to future studies (Schmidt et al., 2009), and were accordingly used to derive effect sizes and 95% confidence intervals. For studies including multiple effect sizes for academic performance and outcomes indicative of academic performance, the average weighted effect size was used in analyses to avoid overrepresentation of these studies, inflation of sample size and distortion of standard error estimates (Lipsey & Wilson, 2001). The analyses were conducted using Comprehensive Meta-Analysis software (Version 3.3; Borenstein et al., 2005).

Forest plots were produced using *r* values and 95% confidence intervals (CI), and Fisher's *Z* was calculated for each individual study to evaluate heterogeneity. For unhelpful outcomes, a high score indicated a higher level of maladaptive variable associated with lower academic performance (i.e., procrastination, burnout, stress, and test anxiety), whilst high scores on helpful outcomes were ideal in promoting academic success (i.e., adjustment,

satisfaction, self-efficacy). Heterogeneity denotes whether the variability in effect sizes within included studies is greater than what would be expected due to random error alone (Cuijpers, 2016), and was evaluated using the Q statistic, a measure of weighted squared deviations around the weighted mean effect size, and the I^2 statistic, whereby 25%, 50%, and 75% suggest low, medium and high levels of heterogeneity, respectively (Higgins & Thompson, 2002). Lastly, Egger's regression intercept (ERI) was used to assess for publication bias (Moreno et al., 2009), and funnel plots were generated to detect any asymmetry (Borenstein et al., 2009).

Results

Studies included in the meta-analysis

In total, 67 studies and 21,272 participants were included in the analyses, (M_{age} = 19.31 years). Only two studies used a longitudinal design. The two most utilized perfectionism measures were the APS-R and HMPS (both n = 24, 75% overall), followed by FMPS (n = 17, 27%), and CAPS (n = 6, 9.4%). Overall, 378 effect sizes across 83 independent samples were included in the analysis (see **Table 3.2** for information containing correlations, study coding and results for all studies included in the meta-analysis).

Table 3.2
Characteristics of Studies Included in the Meta-Analysis

Study	Sample			Measurement						Effect sizes (*r*, 95% CI)					
	Level of Education	*N*	Age	Measure	PS	PC	Academic Performance	Helpful academic Outcome	Unhelpful academic outcome	PS-Performance	PC-Performance	PS-Helpful	PC-Helpful	PS-Unhelpful	PC-Unhelpful
Abdollahi et al. (2016)	Secondary	520	17.24	APS-R	HS	D	—	Academic Hardiness	Test Anxiety	—	—	.51 (.44, .57)	-.29 (-.36, -.21)	-.59 (-.64, -.53)	.52 (.50, .58)
Arana & Furlan (2016)	Tertiary	277	23.91	APS-R	—	D	—	—	Test Anxiety[6]	—	—	—	—	.16 (.04, .28)	.57 (.48, .64)
Blankstein & Winkworth (2004) Sample 1	Tertiary	200	—	HMPS	SOP	SPP	Grade	—	—	.09 (-.05, .23)	-.02 (-.16, .12)	—	—	—	—
Blankstein & Winkworth (2004) Sample 2	Tertiary	100	—	HMPS	SOP	SPP	Grade	—	—	.16 (-.04, .35)	-.16 (-.35, .04)	—	—	—	—
Bong et al. (2014)	Secondary	304	—	HMPS	SOP	SPP	Exam[1]	Academic Self-Efficacy[1]	Test Anxiety Procrastination[7]	.23 (.12, .33)	.13 (.02, .24)	.38 (.28, .47)	.11 (-.00, .22)	-.07 (-.18, .04)	.25 (.14, .35)
Brown et al. (1999)	Tertiary	90	—	FMPS	PStan	CM	GPA	—	—	.30 (.10, .48)	—	—	—	—	—
Burnam et al. (2014)	Tertiary	393	21	FMPS	PStan	CM DA	GPA	—	Procrastination[8]	.17 (.00, .26)	-.01 (-.11, .01) -.04 (-.06, .14)	—	—	-.15 (-.25, -.05)	.09 (-.00, .19)
Castro & Rice (2003) Sample 1	Tertiary	59	20.86	FMPS	PStan	CM DA	GPA	—	—	.24 (-.02, .47)	.13 (-.13, .37) .28 (-.50, -.03)	—	—	—	—
Castro & Rice (2003) Sample 2	Tertiary	65	20.95	FMPS	PStan	CM DA	GPA	—	—	.26 (.02, 0.47)	-.20 (-.42, .05) -.39 (-.58, -.16)	—	—	—	—
Castro & Rice (2003) Sample 3	Tertiary	65	20.28	FMPS	PStan	CM DA	GPA	—	—	.07 (-.18, .31)	.21 (-.04, .43) .13 (-.12, .37)	—	—	—	—
Chang et al. (2015)	Tertiary	345	—	HMPS	SOP	SPP	—	—	Academic Burnout	—	—	—	—	-.31 (-.41, -.20)	.16 (.04, .27)

[6] Correlations were averaged over two measures
[7] Correlations between two unhelpful outcomes were averaged
[8] Correlations were averaged across subscales of this academic outcome measure to make a total score

Chang et al. (2016)	Secondary	283	16	APS-R	HS	D	—	—	Academic Burnout	—	—	—	—	-.23 (-.33, -.13)	.43 (.34, .51)
Closson & Boutilier (2017)	Tertiary	492	21.83	HMPS	SOP	SPP	GPA	Academic Engagement	Procrastination	.35 (.27, .43)	-0.15 (-.24, -.06)	.47 (.40, .54)	-.03 (-.12, .06)	-.14 (-.23, -.05)	.16 (.07, .24)
Cowie et al. (2016)	Tertiary	269	30.7	HMPS	SOP	SPP	—	—	Academic Stress	—	—	—	—	.15 (.03, .26)	.25 (.13, .36)
Damian et al. (2014)	Secondary	584	17.1	CAPS	SOP	SPP	GPA	—	—	.19 (.11, .27)	-.08 (-.16, .00)	—	—	—	—
Damian et al. (2017)	Secondary	386	—	CAPS FMPS	SOP PStan	SPP CM DA	GPA[9]	Academic Self-Efficacy[4]	—	.27 (.17, .36) .29 (.20, .38)	.10 (.00, .20) .07 (-.03, .17) .07 (-.03, .17)	.37 (.28, .45) .35 (.26, .43)	.13 (.03, .23) .07 (-.03, .17) .09 (-.00, .19)	—	—
Elion et al. (2012)	Tertiary	219	21.45	APS-R	HS	D	GPA	—	—	.17 (.04, .30)	-.20 (-.32, -.07)	—	—	—	—
Eum & Rice (2011)	Tertiary	96	19.08	APS-R	HS	D	GPA	—	Test Anxiety	.17 (.00, .33)	-0.17 (-.33, -.00)	—	—	.08 (-.09, .25)	.50 (.36, .62)
Flett et al. (2009)	Tertiary	92	22.20	HMPS	SOP	SPP	Exam	—	—			—	—	—	—
Flett et al. (1992)	Tertiary	131	—	HMPS	SOP	SPP	—	—	Procrastination[10]	—	—	—	—	-.02 (-.19, .15)	.28 (.11, .43)
Flett et al. (2016)	Secondary	242	17.06	CAPS	SOP	SPP	—	—	Academic Stress	—	—	—	—	.30 (.18, .41)	.28 (.16, .39)
Fong & Yuen (2009)	Primary	331	—	APS-R	HS	D	Exam	—	—	-.32 (-.41, -.22)	.25 (.14, .35)	—	—	—	—
Franche et al. (2012) Sample 1	Tertiary	159	19.32	HMPS	SOP	SPP	GPA	Academic Satisfaction	—	.20 (.05, .35)	-.01 (-.17, .15)	.31 (.16, .44)	.07 (-.09, .22)	—	—
Franche et al. (2012) Sample 2	Tertiary	538	19.36	HMPS	SOP	SPP	GPA	Academic Satisfaction	—	.34 (.26, .41)	.09 (.01, .17)	.18 (.10, .26)	-.10 (-.18, -.02)	—	—
Garratt-Reed et al. (2018)	Tertiary	126	23.64	FMPS-SF	PStan	CM	—	—	Academic Burnout[5]	—	—	—	—	.00 (-.17,.17)	.38 (.22, .52)
Gaudreau & Thompson (2010)	Tertiary	397	20.39	FMPS-SF HMPS-SF	PStan SOP	CM DA SPP	—	Academic Satisfaction	—	—	—	.06 (-.04, .16) .07 (-.03, .17)	-.10 (-.20, -.00) -.15 (-.24, -.05) -.09 (-.19, .00)	—	—

[9] Correlations were averaged over 3 time points
[10] Correlations were averaged across subscales of this academic outcome measure to make a total score

Gaudreau et al. (2016)	Tertiary	583	20.48	HMPS-SF	SOP	SPP	—	Academic Satisfaction	—	—	—	.13 (.05, .21)	-.08 (-.16, .00)	—	—
Gilman et al. (2005) Sample 1	Secondary	341	14.59	APS-R	HS	D	—	Academic Satisfaction	—	—	—	.34 (.24, .43)	-.28 (-.38, -.18)	—	—
Gilman et al. (2005) Sample 2	Secondary	291	15.14	APS-R	HS	D	—	Academic Satisfaction	—	—	—	.37 (.27, .47)	-.12 (-.24, -.00)	—	—
Grzegorek et al. (2004)	Tertiary	273	19.87	APS-R	HS	D	GPA[11]	—	—	.31 (.20, .41)	-.06 (-.18, .06)	—	—	—	—
Hanchon (2010)	Tertiary	180	19.8	FMPS	PStan	CM DA	—	Academic Self-Efficacy	—	—	—	.20 (.06, .34)	-.09 (-.23, .06) -.27 (-.40, -.13)	—	—
Harvey et al. (2017)	Primary	203	9.83	CAPS	SOP[12]	SPP	Grade	—	—	.22 (.07, .34)	-.25 (-.37, -.12)	—	—	—	—
Herman et al. (2013)	Primary	547	6.22	CAPS	SOP	SPP	Test	—	—	-.10 (-.18, -.02)	-.15 (-.23, -.07)	—	—	—	—
Jang & Pak (2013)	Secondary	293	15.88	FMPS	PStan	CM DA	—	Academic Adjustment Self-Regulated Learning Strategies[13]	—	—	—	.21 (.10, .32)	-.14 (-.25, -.03) -.11 (-.22, .00)	—	—
Jaradat (2013)	Secondary	419	17.93	APS-R	HS	D	GPA	—	—	.28 (.19, .37)	-.17 (-.26, -.08)	—	—	—	—
Kavanagh et al. (2016) Sample 1	Tertiary	89	26.17	HMPS	SOP	SPP	—	—	Test Anxiety	—	—	—	—	.29 (.09, .47)	.24 (.08, .39)
Kavanagh et al. (2016) Sample 2	Tertiary	143	21.52	HMPS	SOP	SPP	—	—	Test Anxiety	—	—	—	—	.29 (.14, .43)	.40 (.21, .56)
Kawamura et al. (2002) Sample 1	Tertiary	89	—	FMPS	PStan	CM DA	GPA	—	—	.55 (.39, .68)	.14 (-.07, .34) -.02 (-.23, .19)	—	—	—	—
Kawamura et al. (2002) Sample 2	Tertiary	56	—	FMPS	PStan	CM DA	GPA	—	—	.19 (-.08, .43)	.15 (-.12, .40) -.25 (-.48, .01)	—	—	—	—
Kawamura et al. (2002) Sample 3	Tertiary	117	—	FMPS	PStan	CM DA	GPA	—	—	.31 (.09, .50)	.22 (-.00, .43) -.11 (-.33, .12)	—	—	—	—

[11] Correlation was averaged over two time points
[12] Correlation was the average of SOP-striving and SOP-critical.
[13] Correlations averaged across the two outcomes

Kawamura et al. (2002) Sample 4	Tertiary	75	—	FMPS	PStan	CM DA	GPA	—	—	.34 (.17, .49)	-.08 (-.26, .10) -.09 (-.27, .09)	—	—	—	—
Klibert et al. (2005)	Tertiary	475	20.9	HMPS	SOP	SPP	—	—	Procrastination	—	—	—	—	-.28 (-.36, -.19)	.05 (-.04, .14)
Kljajic et al. (2017)	Tertiary	312	19.17	HMPS-SF	SOP	SPP	GPA	Academic Engagement [14]	Procrastination Academic Burnout[8]	.19 (.10, .27)	-.17 (-.25, -.08)	.35 (.25, .44)	-.01 (-.12, .10)	-.18 (-.27, -.06)	.23 (.12, .33)
Kurtovic et al. (2019)	Tertiary	227	20.59	APS-R	HS	D	Grade	—	Procrastination	.32 (.20, .43)	-.11 (-.24, .02)	—	—	-.43 (-.53, -.32)	.31 (.19, .42)
Leenaars & Lester (2006) Sample 1	Tertiary	30	—	APS-R	HS	D	GPA	—	—	.20 (.02, .37)	-.17 (-.34, .01)	—	—	—	—
Leenaars & Lester (2006) Sample 2	Tertiary	117	23.2	APS-R	HS	D	GPA	—	—	.24 (-.13, .55)	-.20 (-.52, .17)	—	—	—	—
Mann (2004)	Tertiary	200	23.9	HMPS	SOP	SPP	—	Academic Adjustment	—	—	—	.07 (-.07, .21)	.28 (.15, .40)	—	—
Mills & Blankstein (2000)	Tertiary	207	22.4	HMPS	SOP	SPP	—	Self-Regulated Learning Strategies[15]	—	—	—	.17 (.03, .30)	-.10 (-.23, .04)	—	—
Mobley et al. (2005)	Tertiary	248	19.94	APS-R	HS	D	GPA	—	—	.10 (-.02, .22)	-.15 (-.27, -.03)	—	—	—	—
Mofield & Peters (2018)	Primary Secondary	416	—	FMPS	PStan	CM DA	—	Academic Self-Efficacy	—	—	—	.53 (.46, .60)	-.07 (-.17, .03) -.30 (-.39, -.21)	—	—
Montgomery et al. (2017)	Tertiary	273	—	HMPS	SOP	SPP	—	Academic Adjustment	Procrastination	—	—	.36 (.25, .46)	-.39 (-.49, -.28)	.14 (.02, .25)	.37 (.26, .47)
Nepon et al. (2016) Sample 1	Tertiary	277	20.6	HMPS	SOP	SPP	—	—	Academic Burnout[10]	—	—	—	—	.21 (.09, .32)	.36 (.25, .46)
Nepon et al. (2016) Sample 2	Tertiary	250	19.9	HMPS	SOP	SPP	—	—	Academic Burnout[10]	—	—	—	—	.15 (.03, .27)	.32 (.20, .43)
Nguyen & Deci (2016)	Tertiary	381	20	FMPS-SF	PStan	—	Grade	—	—	.11 (.01, .21)	—	—	—	—	—
Nounopoulos et al. (2006)	Primary	166	12.59	APS-R	HS	D	GPA	—	—	.31 (.17, .44)	-.26 (-.40, -.11)	—	—	—	—
Onwuegbuzie (2000)	Tertiary	135	26	HMPS	SOP	SPP	—	—	Procrastination	—	—	—	—	-.03 (-.20, .14)	.24 (.07, .39)

[14] Correlations were averaged across subscales of this academic outcome measure to make a total score
[15] Correlations were averaged across subscales of this academic outcome measure to make a total score

Pulford & Sohal (2006)	Tertiary	124	19	FMPS	PStan	CM	GPA[16]	—	—	.24 (.07, .40)	.17 (-.00, .34)	—	—	—	—
Rice & Ashby (2007)	Tertiary	310	—	APS-R	HS	D	GPA	—	—	.16 (.05, .27)	-.15 (-.26, -.04)	—	—	—	—
Rice et al. (2013a) Sample 1	Tertiary	232	—	APS-R	HS	D	GPA[8]	Academic Self-Efficacy[10]	—	.16 (.03, .28)	-.07 (-.20, .06)	.23 (.10, .35)	-.33 (-.44, -.21)	—	—
Rice et al. (2013a) Sample 2	Tertiary	215	—	APS-R	HS	D	GPA	Academic Self-Efficacy[10]	—	.21 (.08, .33)	-.19 (-.32, -.06)	.38 (.26, .49)	-.18 (-.31, -.05)	—	—
Rice et al. (2013b) Sample 1	Tertiary	175	18.77	APS-R	—	D	GPA[17]	Academic Self-Efficacy[10]	—	—	-.07 (-.22, .08)	—	-.18 (-.32, -.03)	—	—
Rice et al. (2013b) Sample 2	Tertiary	119	18.77	APS-R	—	D	GPA	Academic Self-Efficacy[10]	—	—	-.08 (-.26, .10)	—	-.09 (-.27, .09)	—	—
Rice, et al. (2006a)	Tertiary	403	—	APS-R	HS	D	—	Academic Adjustment[11]	—	—	—	.24 (.15, .33)	-.33 (-.41, -.24)	—	—
Rice et al. (2006b)	Tertiary	364	19.7	APS-R	HS	D	—	Academic Adjustment	Academic Stress	—	—	.35 (.26, .44)	-.08 (-.18, .02)	-.43 (-.51, -.34)	.48 (.40, .56)
Sevlever & Rice (2010) Sample 1	Tertiary	100	—	APS-R	HS	D	GPA	—	—	.34 (.15, .50)	-.22 (-.40, -.02)	—	—	—	—
Sevlever & Rice (2010) Sample 2	Tertiary	75	—	APS-R	HS	D	GPA	—	—	.02 (-.18, .22)	-.07 (-.26, .13)	—	—	—	—
Shaunessy et al. (2011) Sample 1	Secondary	141	15.74	APS-R	HS	D	GPA	—	—	.34 (.19, .48)	-.20 (-.35, -.04)	—	—	—	—
Shaunessy et al. (2011) Sample 2	Secondary	178	15.74	APS-R	HS	D	GPA	—	—	.43 (.30, .54)	-.13 (-.27, .02)	—	—	—	—
Shih (2012)	Secondary	456	13.7	FMPS	PStan	CM DA	—	Academic Engagement[18]	Academic Burnout[13]	—	—	.52 (.45, .58)	.06 (-.03, .15)	-.36 (-.44, -.28)	.08 (-.01, .17)
Shim et al. (2016)	Secondary	169	13.07	FMPS	PStan	CM	Grade	—	—	.18 (.03, .32)	-.06 (-.21, .09)	—	—	—	—
Sotardi & Dubien (2019)	Tertiary	1028	18.65	APS-R	HS	D	GPA	—	—	.26 (.20, .32)	.03 (-.03, .09) -.07 (-.13, -.01)	—	—	—	—
Stoeber et al. (2009)	Tertiary	105	20	HMPS	SOP	SPP	—	—	Test Anxiety	—	—	—	—	.06 (-.13, .25)	.33 (.15, .49)

[16] Averaged across two timepoints
[17] Correlation was an average over underrepresented and proportional subgroups.
[18] Correlations were averaged across subscales of this academic outcome measure to make a total score

Stoeber et al. (2015)	Tertiary	100	19.9	HMPS	SOP	SPP	Exam	—	—	.22 (.02, .40)	-.12 (-.30, .08)	—	—	—	—
Stornelli et al. (2009)	Primary	223	—	CAPS	SOP	SPP	Exam[19]	—	—	-.02 (-.15, .11)	-.05 (-.18, .08)	—	—	—	—
Uzun Ozer et al. (2014)	Tertiary	402	22.90	FMPS	PStan	DA	—	—	Procrastination	—	—	—	—	-.26 (-.35, -.17)	.20 (.10, .29)
Vandiver & Worrell (2002) Sample 1	Secondary	161	13.14	APS-R	HS	D	GPA	—	—	.32 (.17, .45)	-.26 (-.40, -.11)	—	—	—	—
Vandiver & Worrell (2002) Sample 2	Secondary	181	13.23	APS-R	HS	D	GPA	—	—	.33 (.19, .45)	-.19 (-.33, -.05)	—	—	—	—
Vansteenkiste et al. (2010)	Secondary	190	—	FMPS	PStan	—	Exam	—	—	.13 (-.03, .28)	—	—	—	—	—
Vanstone & Hicks (2019)	Tertiary	148	22.84	APS-R	HS	D	—	—	Test Anxiety	—	—	—	—	-.06 (-.22, .10)	.45 (.31, .57)
Verner-Filion & Gaudreau (2010)	Tertiary	198	19.18	HMPS-SF	SOP	SPP	GPA	Academic Satisfaction	—	.33 (.20, .45)	-.02 (-.16, .12)	.11 (-.03, .25)	-.23 (-.36, -.09)	—	—
Wang (2012)	Tertiary	348	19.75	APS-R	HS	D	Grade	Academic Self-Efficacy	—	.38 (.23, .51)	-.24 (-.39, -.08)	.59 (.47, .69)	-.27 (-.42, -.11)	—	—
Witcher et al. (2007)	Tertiary	130	25.96	HMPS	SOP	SPP	Exam[20]	—	—	.28 (.11, .43)	.05 (-.12, .22)	—	—	—	—
Zhang et al. (2007)	Tertiary	482	—	FMPS	PStan	CM DA	—	Academic Engagement[21]	Academic Burnout[16]	—	—	.35 (.27, .43)	-.05 (-.14, .04)	.06 (-.03, .15)	.18 (.09, .27)

Note. FMPS = Frost Multidimensional Perfectionism Scale (Frost et al., 1990), HMPS = Hewitt Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), HMPS-SF = Short Form of the Multidimensional Perfectionism Scale (Cox et al., 2002), CAPS = Child and Adolescent Perfectionism Scale (Flett et al., 2001), , APS-R = Almost Perfect Scale-Revised (Slaney et al., 2001); PS = Perfectionistic strivings, PStan = Personal Standards, SOP = Self-Oriented Perfectionism, HS = High Standards, PC = Perfectionistic concerns, CM = Concern Over Mistakes, DA = Doubts About Actions, SPP = Socially Prescribed Perfectionism, D = Discrepancy; GPA = Grade point average

[19] Averaged across two exams (English and Math)
[20] Averaged across two exams (Midterm and final)
[21] Correlations were averaged across subscales of this academic outcome measure to make a total score

Perfectionistic Strivings: The relationship with Academic Performance and Helpful and Unhelpful Academic Outcomes

The studies and effect sizes included in these analyses are listed in **Table 3.3** and **Figures 3.3-3.5**. Studies with multiple outcomes of academic performance, as well as helpful and unhelpful indicators of academic success, were combined to create an average effect size. With regard to academic performance, our analyses indicated small-to-medium positive relationships for all subscales of perfectionistic strivings (see **Table 3.3**) with no substantial differences between measures.

In terms of helpful academic outcomes, our analyses indicated High Standards and Personal Standards showed medium positive relationships with helpful academic outcomes known to promote successful learning, whilst Self-Oriented Perfectionism showed a small positive relationship (see **Table 3.3**). The overlap of 95% confidence intervals suggest High Standards and Personal Standards had similar effects, however, there appeared to be a larger difference between High Standards and Self-Oriented Perfectionism such that High Standards had a stronger positive relationship with helpful academic outcomes.

When examining this relationship between perfectionistic strivings subscales with unhelpful academic outcomes known to hinder successful learning, our analyses revealed High Standards had a small-to-medium negative relationship, whilst Personal Standards and Self-Oriented Perfectionism showed no significant relationship. Subgroup analyses examining the overlap of 95% confidence intervals suggested that all subscales did have some similar effects, but High Standards appeared to have the strongest negative relationship.

Table 3.3

Average effect sizes and 95% confidence intervals for subscales of perfectionism and academic outcomes.

Perfectionism subscale	Academic Performance		Helpful Academic Outcomes		Unhelpful Academic Outcomes	
	r+	95% CI	*r*+	95% CI	*r*+	95% CI
Perfectionistic Strivings						
High Standards	.25*	.21, .29	.39*	31, .44	-.23*	-.41, -.01
Personal Standards	.25*	20, .30	.34*	.22, .45	-.11	-.25, .05
Self-Oriented Perfectionism	.22*	12, .26	.25*	.15, .33	.02	-.08, .13
Perfectionistic Concerns						
Discrepancy	-.17*	-.19, -.14	-.22*	-.28, -.15	.45*	40, .50
Concerns Over Mistakes	.06	-.00, .12	-.03	-.07, .02	.17*	.06, .27
Doubts About Actions	-.08*	-.16, -.00	-.10	-.20, .02	.15*	.07, .20
Socially Prescribed Perfectionism	-.06	-0.13, .01	-.04	-.11, .04	.25*	20, .29

Note. *$p < .05$.

Figure 3.3.

Forest Plot of the Relationship Between Subscales of Perfectionistic Strivings and Academic Performance. Favours A = Less Academic Performance, Favours B = Greater Academic Performance.

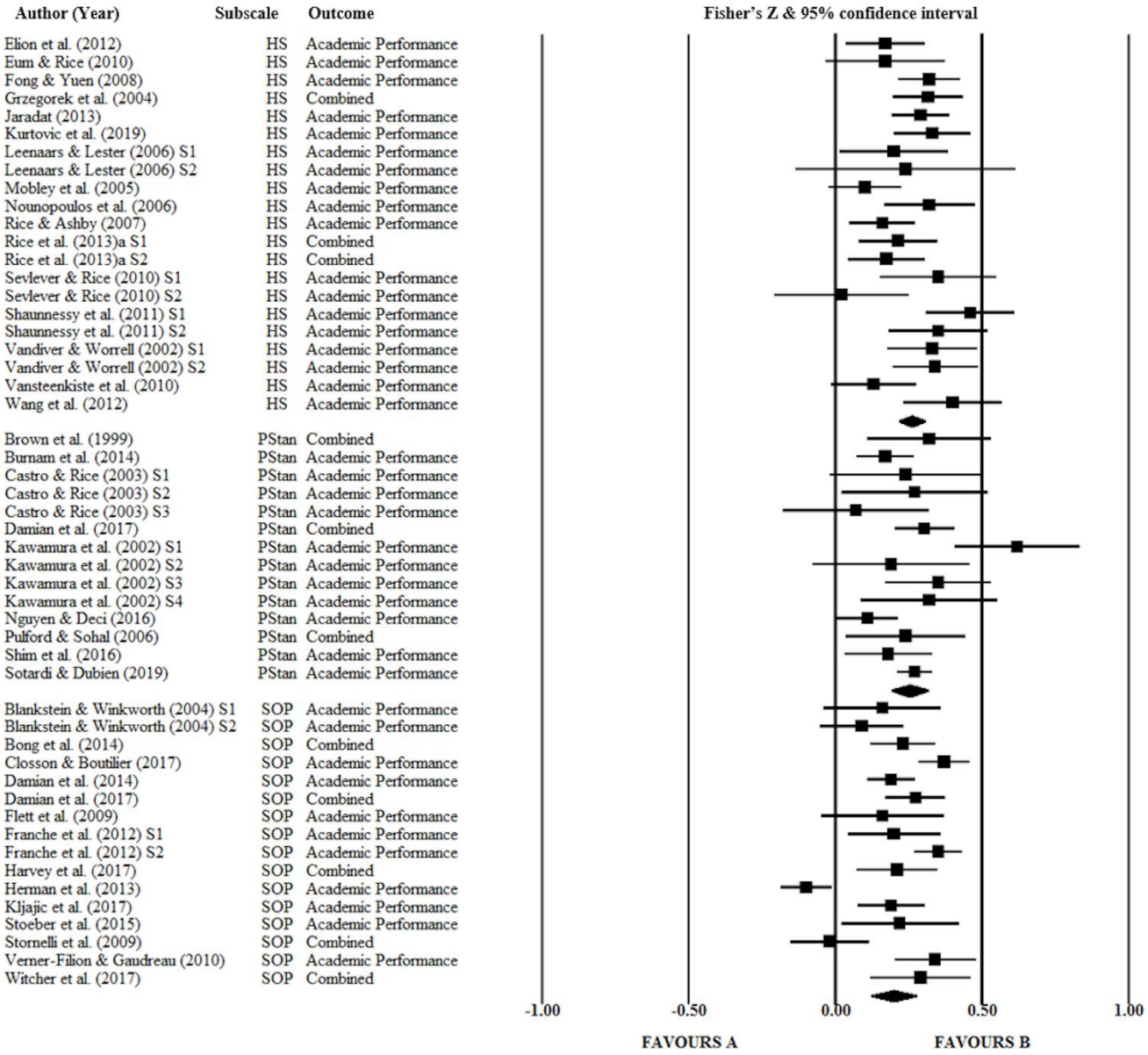


Figure 3.4.

Forest Plot of the Relationship Between Subscales of Perfectionistic Strivings and Helpful Academic Outcomes. Favours A = Less Academic Outcome, Favours B = Greater Academic Outcome.

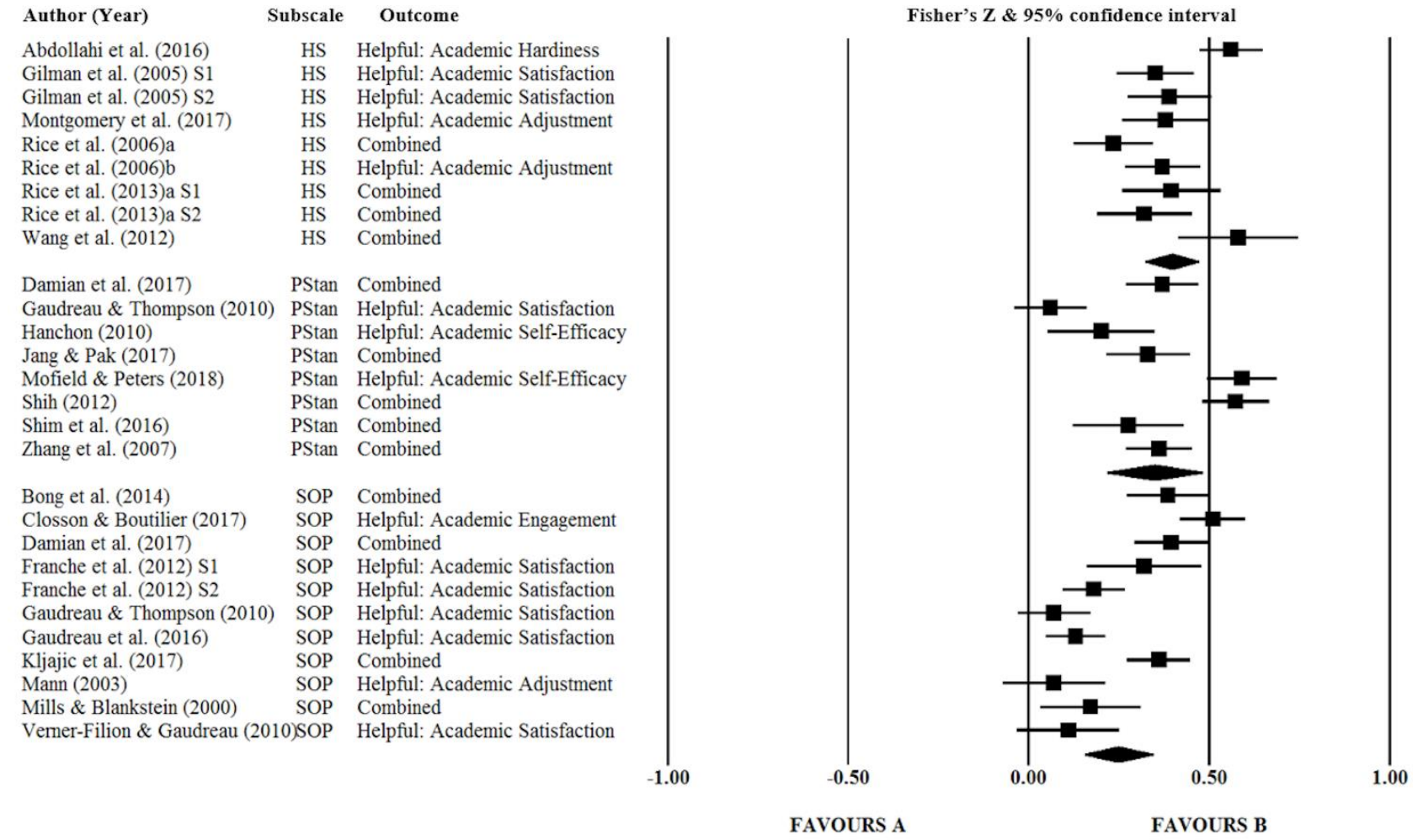
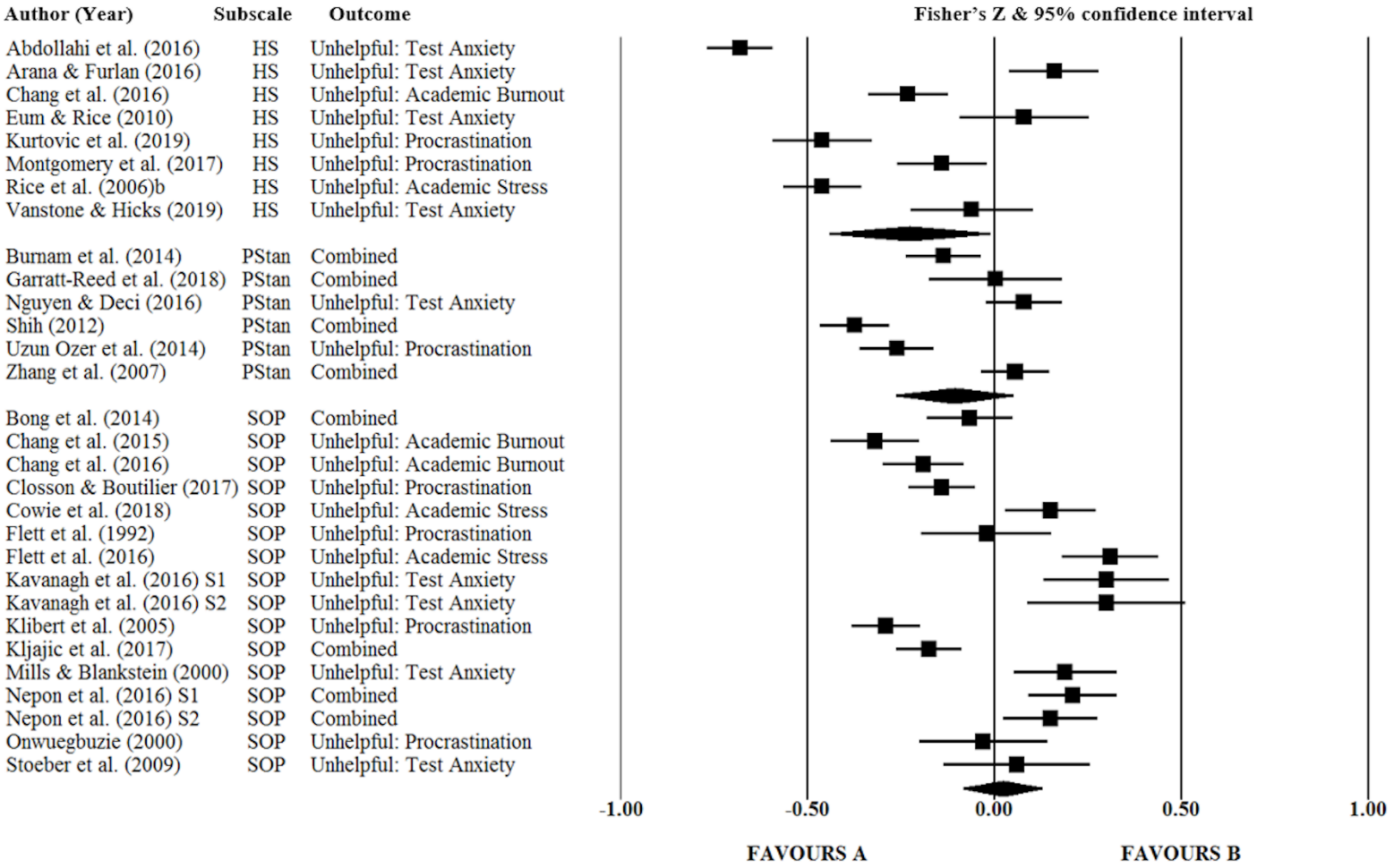


Figure 3.5.

Forest Plot of the Relationship Between Subscales of Perfectionistic Strivings and Unhelpful Academic Outcomes. Favours A = Less Academic Outcome, Favours B = Greater Academic Outcome.



Perfectionistic Concerns: The relationship with Academic Performance and Helpful and Unhelpful Academic Outcomes

The studies and effect sizes included in these analyses are listed in **Table 3.3** and **Figures 3.6-3.8**. Our analyses indicated the subscales of Discrepancy and Doubts About Actions held small negative relationships with academic performance, whilst Concerns Over Mistakes and Socially Prescribed Perfectionism were unrelated. The analysis of 95% confidence intervals suggest Discrepancy had a stronger effect on academic performance in comparison to Concerns over Mistakes and Socially Prescribed Perfectionism.

Discrepancy showed a small-to-medium negative relationship with helpful academic outcomes indicative of academic performance, whilst all other subscales were unrelated. The overlap of 95% confidence intervals reveal Discrepancy held a stronger negative relationship with helpful academic outcomes over and above Concerns Over Mistakes and Socially Prescribed Perfectionism, but not Doubts About Actions.

Finally, our analyses indicated all perfectionistic concerns subscales shared positive associations with unhelpful outcomes that hinder successful learning. Of note, subgroup analyses examining the overlap of 95% confidence intervals again suggested that effects were dependent on the perfectionism measure. Discrepancy held a stronger negative relationship with helpful academic outcomes over and above Concerns Over Mistakes, Doubts About Actions and Socially Prescribed Perfectionism. Additionally, Socially Prescribed Perfectionism was stronger than Doubts About Actions.

Figure 3.6.

Forest Plot of the Relationship Between Subscales of Perfectionistic Concerns and Academic Performance. Favours A = Less Academic Performance, Favours B = Greater Academic Performance

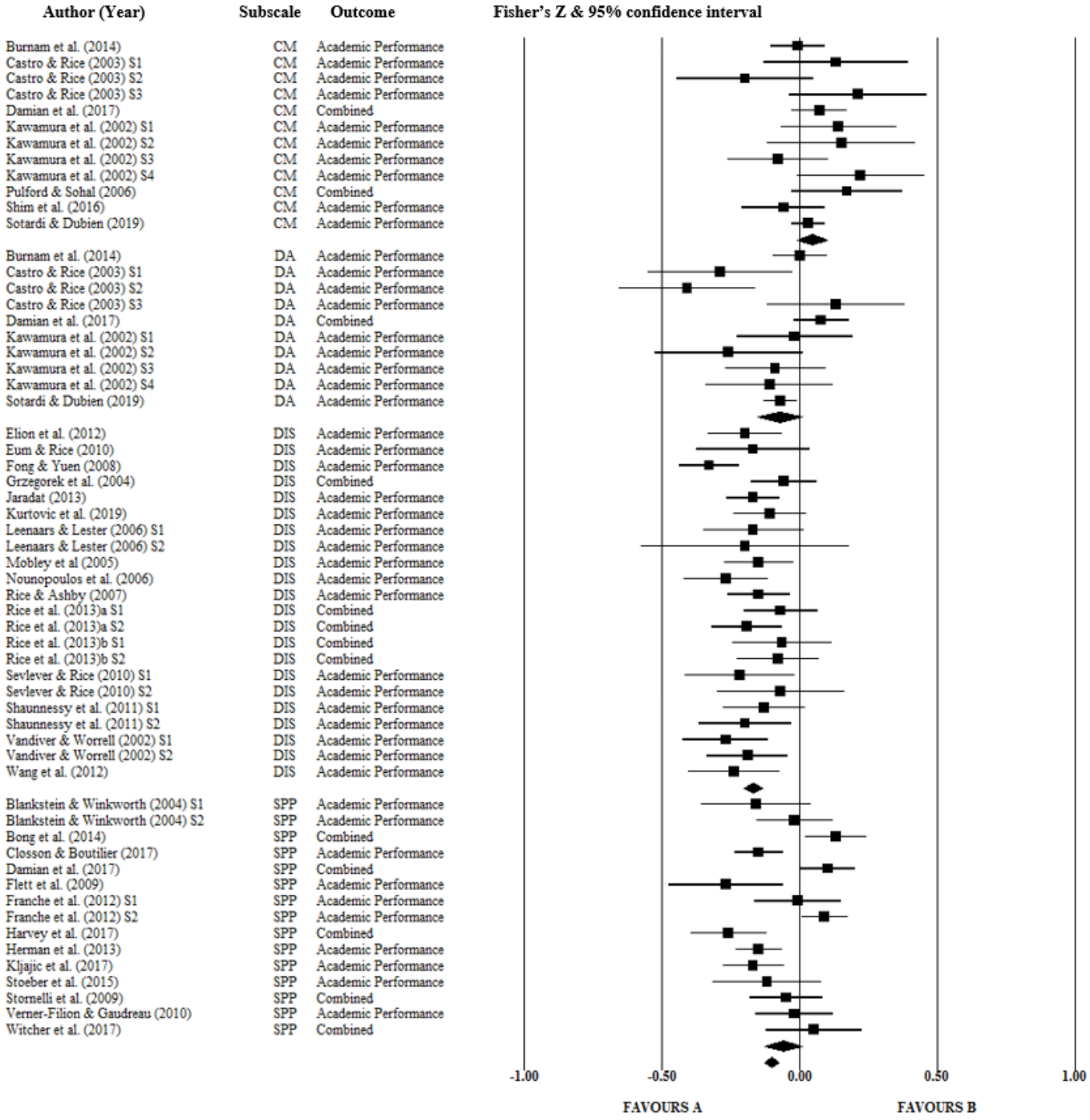


Figure 3.7.

Forest Plot of the Relationship Between Subscales of Perfectionistic Concerns and Helpful Academic Outcomes. Favours A = Less Academic Outcome, Favours B = Greater Academic Outcome.

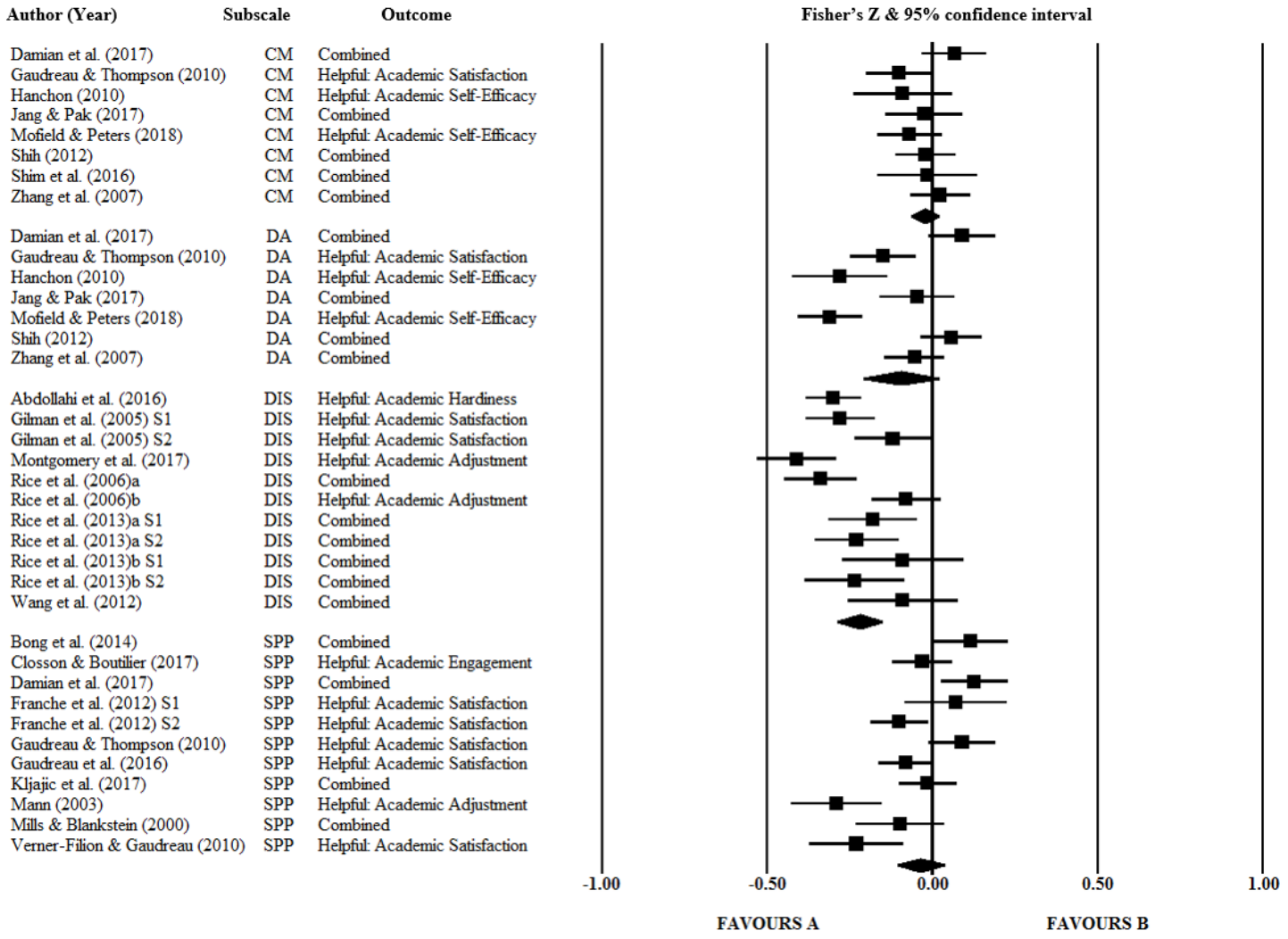
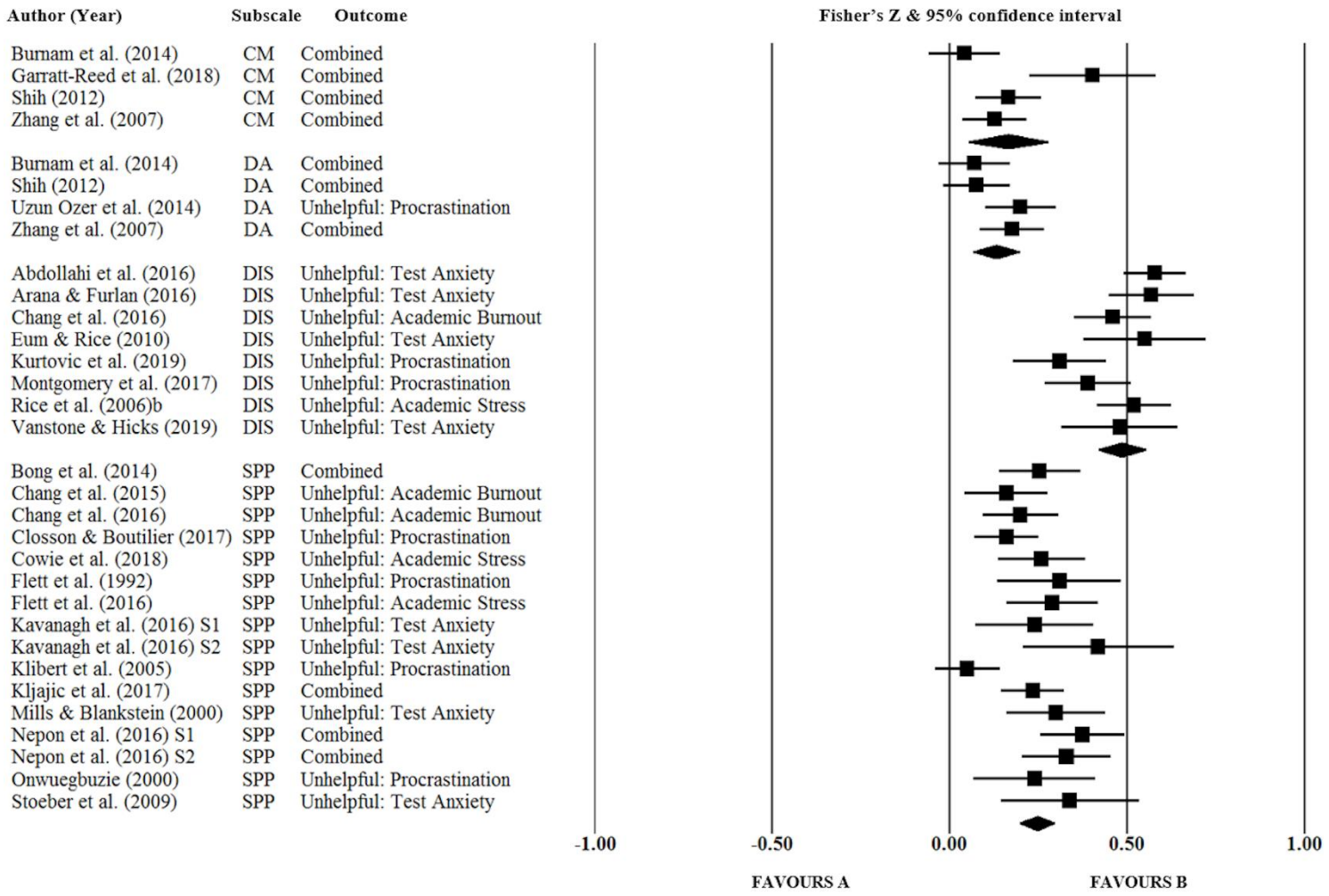


Figure 3.8.

Forest Plot of the Relationship Between Subscales of Perfectionistic Concerns and Unhelpful Academic Outcomes. Favours A = Less Academic Outcome, Favours B = Greater Academic Outcome.



Heterogeneity

An analysis of the heterogeneity of the total weighted mean effects indicated the observed variability across effect sizes likely arose from factors extraneous to sampling error (Q = 2669.33, p < .001). Moreover, the I^2 indicated a high degree of heterogeneity (93.22%). To explore the sources for observed heterogeneity, we performed additional analyses by calculating Q and I^2 for each perfectionism dimension and academic variable separately. Further analyses revealed moderate to high degrees of heterogeneity for each subgroup (see **Table 3.4** for Q and I^2 values for all categories). This supports the usefulness of focusing on the observed effect sizes for each subgroup rather than perfectionism and academic outcomes as a whole.

Publication Bias

To assess publication bias, a p value of <. 05 was used as the metric, as it indicates a significant relationship between the effect size and precision. Funnel plots were generated for the relationship held between perfectionistic strivings and perfectionistic concerns with academic performance, helpful academic outcomes, and unhelpful academic outcomes (see **Figures 3.9-3.14**). Additionally, the 95% confidence interval of ERI was indicative of publication bias if it was not greater than zero (Laird et al., 2017). Studies were initially combined in a single analysis, which revealed no indication of publication bias (*ERI* = -1.39, p = .31). However, when studies were grouped by perfectionism dimension and academic variable category (performance, helpful outcome, unhelpful outcome), publication bias was detected for perfectionistic strivings when grouped with helpful academic outcomes only (see **Table 3.4** for ERI values across all categories). Thus, estimates of the relationship between perfectionistic strivings and helpful academic outcomes need to be interpreted cautiously.

Figure 3.9

Funnel Plot for the Relationship between Studies Examining Perfectionistic Strivings and Academic Performance.

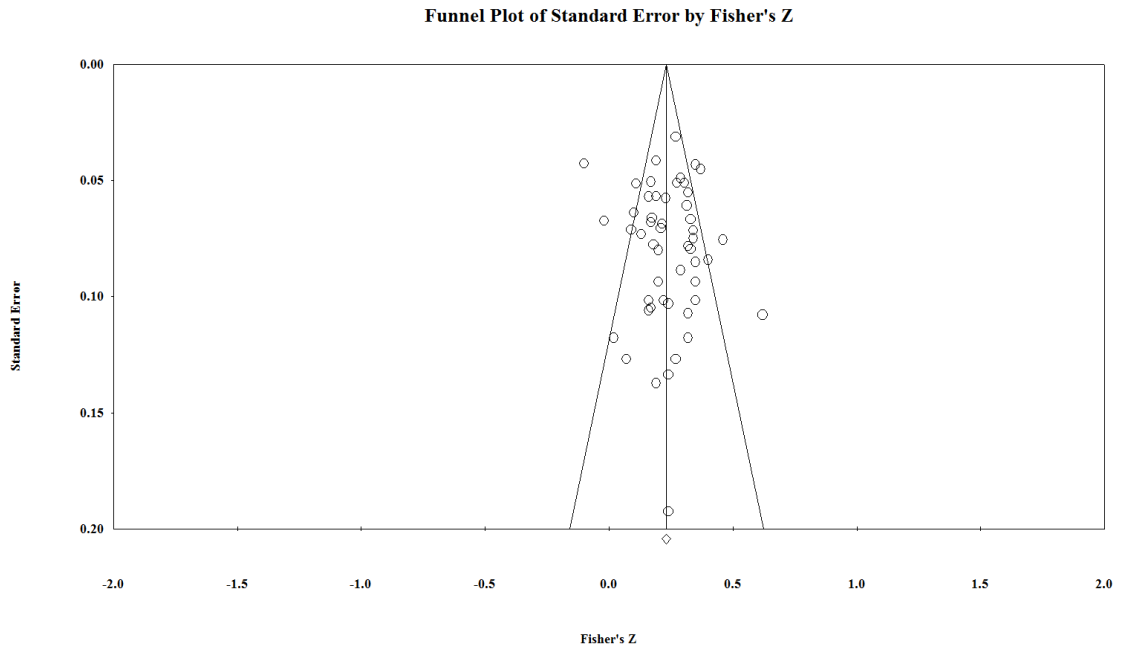


Figure 3.10

Funnel Plot for the Relationship between Studies Examining Perfectionistic Strivings and Helpful Academic Outcomes.

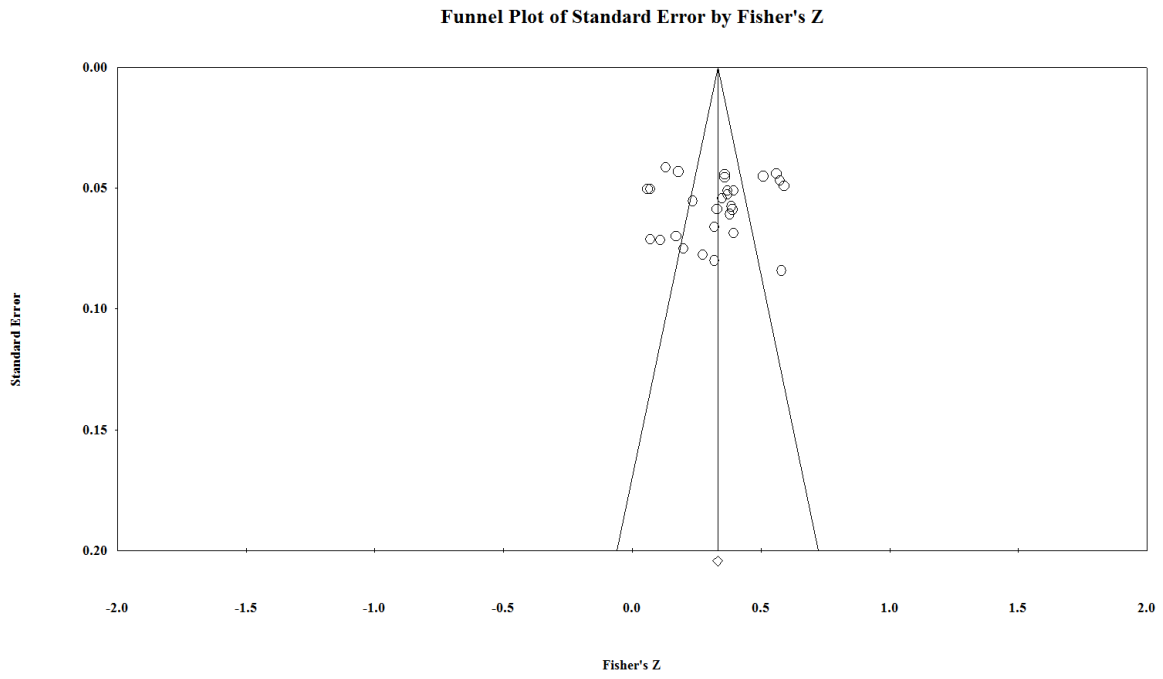


Figure 3.11

Funnel Plot for the Relationship between Studies Examining Perfectionistic Strivings and Unhelpful Academic Outcomes.

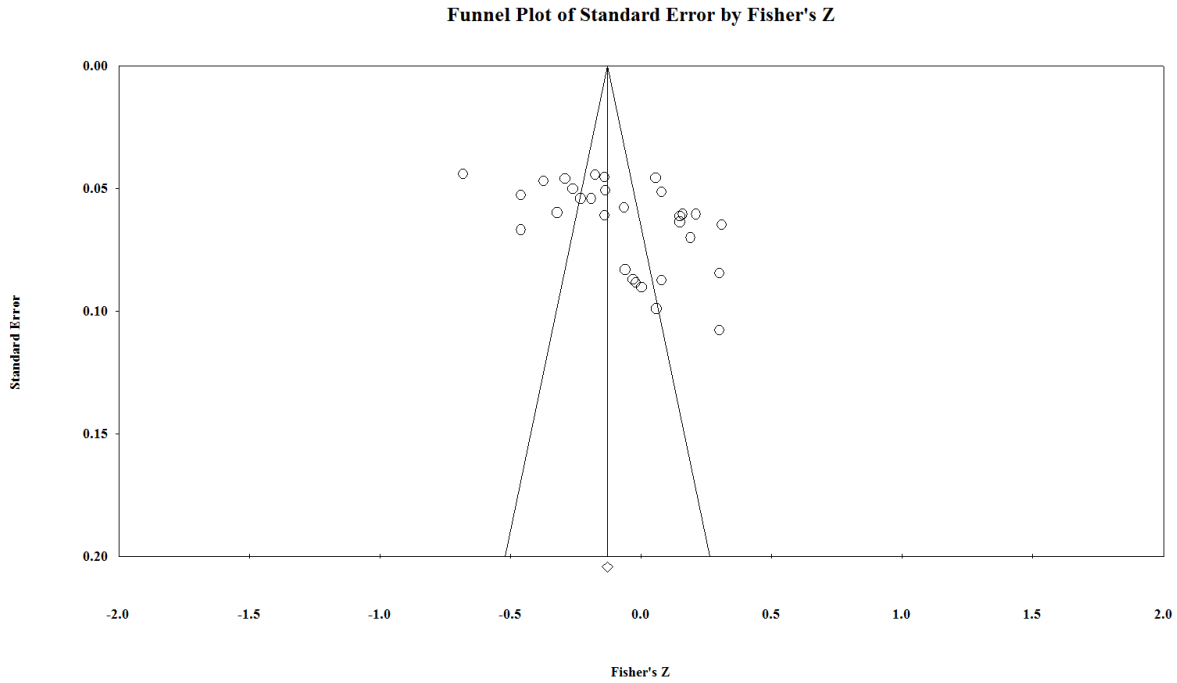


Figure 3.12

Funnel Plot for the Relationship between Studies Examining Perfectionistic Concerns and Academic Performance.

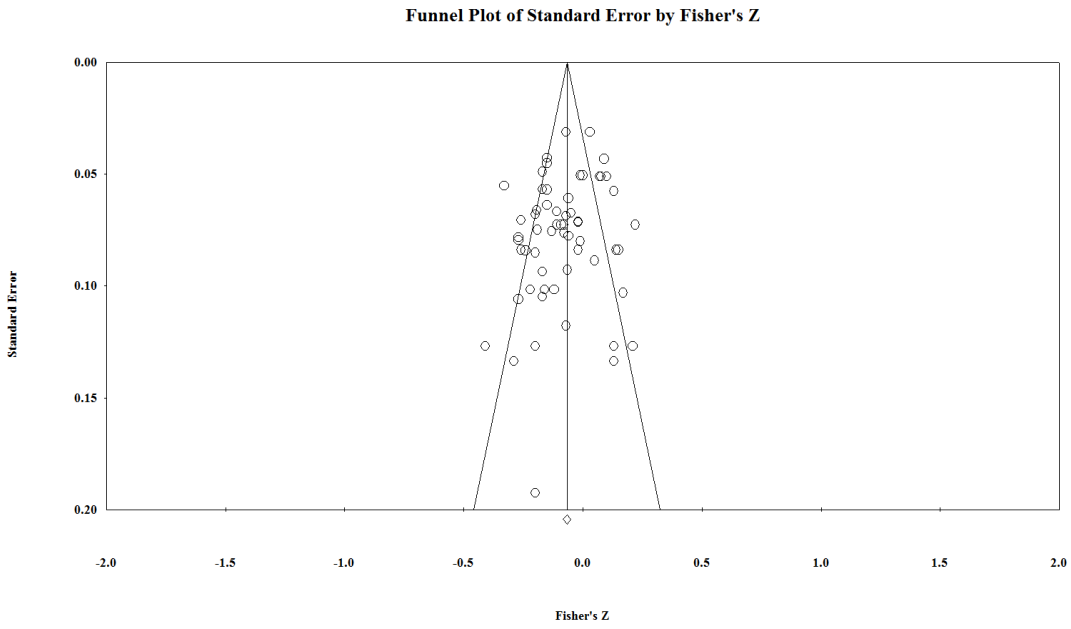


Figure 3.13

Funnel Plot for the Relationship between Studies Examining Perfectionistic Concerns and Helpful Academic Outcomes.

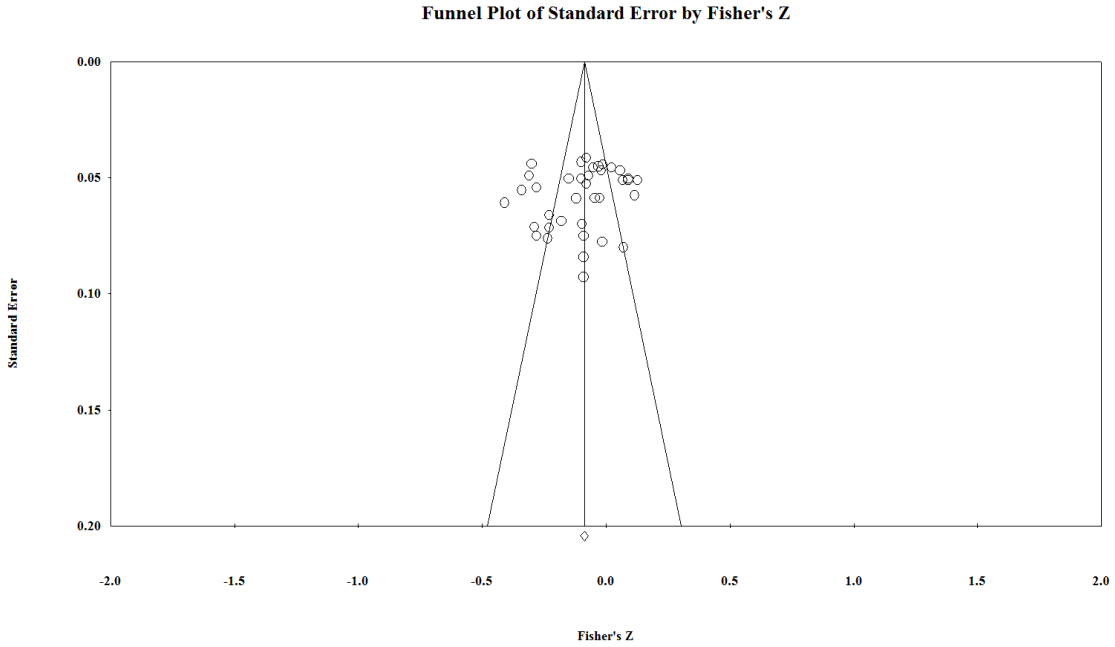


Figure 3.14

Funnel Plot for the Relationship between Studies Examining Perfectionistic Concerns and Unhelpful Academic Outcomes.

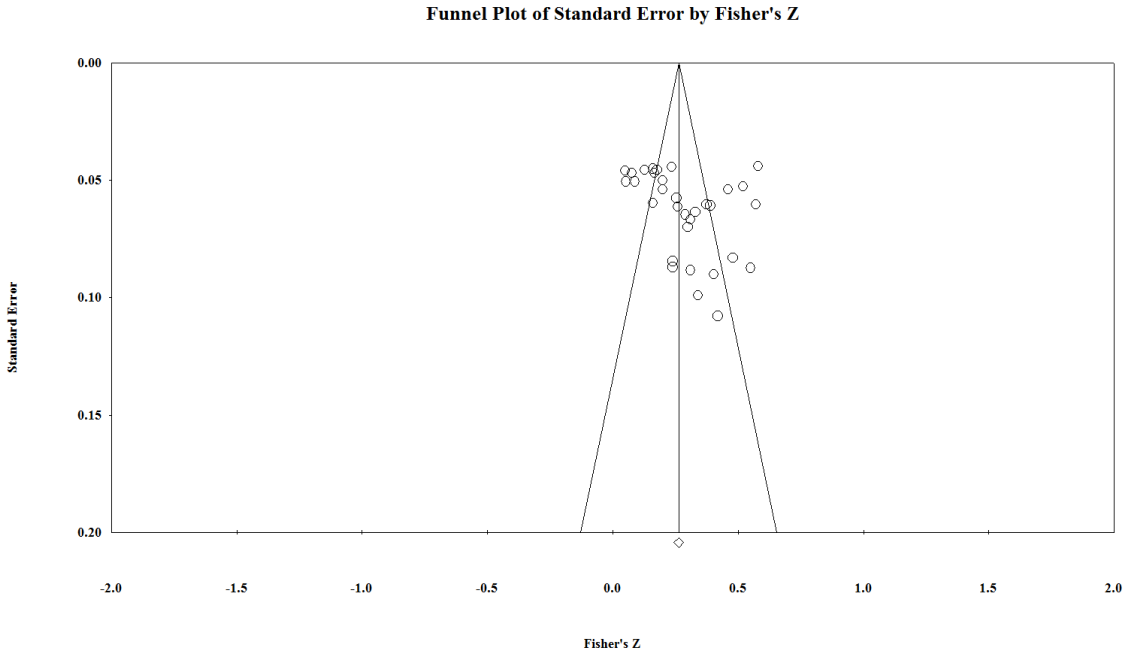


Table 3.4.

Analysis of Heterogeneity (Q;I^2) and Publication Bias (ERI) for Each Perfectionism Dimension and Academic Outcome Category

Categories	Q-test[a]	I^2 – test[a]	*ERI* (95% CI)[b]
Perfectionistic Strivings			
Performance	171.76*	70.89	0.41 (-1.10, 1.92)
Helpful Outcomes	238.96*	88.70	-1.93 (-7.94, 4.08)
Unhelpful Outcomes	535.33*	94.58	8.75* (2.69, 14.81)
Perfectionistic Concerns			
Performance	216.38*	73.20	-1.08 (-2.50, 0.34)
Helpful Outcomes	228.34*	84.23	-2.57 (-6.74, 1.60)
Unhelpful Outcomes	242.56*	87.22	4.06 (-0.03, 8.16)

Note. *$p < .05$.
[a] Indicates tests of heterogeneity.
[b] Indicates publication bias where ERI = Eggers' regression intercept.

Discussion

The aim of this chapter was to examine the differential impact of perfectionistic strivings and concerns on outcomes related to successful learning and academic achievement, with a focus in clarifying the difference between pursuit of perfectionism and the pursuit of excellence. Overall, all measures of perfectionistic strivings were significantly related to higher academic performance and helpful learning outcomes. As expected, the strength of this relationship depended on the measure, such that High Standards had a stronger positive effect with helpful academic outcomes compared to Self-Oriented Perfectionism. Moreover, only High Standards was negatively related to outcomes that commonly hinder successful learning, whilst other measures of perfectionistic strivings had no effect. Conversely, only

two measures of perfectionistic concerns had a harmful effect on academic performance, and whilst all measures were positively related to unhelpful academic outcomes, Discrepancy was the only subscale to show a negative relationship to helpful outcomes that foster academic achievement. The present study offers preliminary evidence for the distinction between perfectionistic strivings and pursuit of excellence, but further research is required to more adequately clarify the complex construct of perfectionism in future avenues of research.

Perfectionistic Strivings and Successful Learning

Consistent with the previous findings of Madigan (2019), we found all measures of perfectionistic strivings showed a small-medium positive relationship with academic performance. However, collectively, these results suggest that these measures differ in the effect they have on successful learning. In particular, High Standards appears to foster successful learning and protect against the effect of harmful academic outcomes, whilst other perfectionistic strivings measures, despite their (less) positive relationship with performance and helpful outcomes *per se*, do not provide a protective relationship against common barriers that hinder successful learning.

Evidence suggests that High Standards from the APS-R may not adequately capture the 'all or nothing' thinking and rigid pursuit of perfection, and rather reflects a healthy striving for excellence (Blasberg et al., 2016). High Standards not only shared a positive relationship with helpful outcomes of successful learning over and above Self-Oriented Perfectionism, but importantly served as a protective factor against outcomes such as text anxiety, academic burnout and stress. This was not the case for Personal Standards and Self-Oriented Perfectionism, which may indicate these two measures are more reflective of the perfectionism construct and suggest perfectionistic strivings are not completely 'adaptive'. These findings also suggest why mixed results exist about the adaptiveness of perfectionistic strivings. It is important to note, however, the helpful nature of Personal Standards and Self-

Oriented Perfectionism in promoting academic performance and helpful outcomes cannot be ignored and is less in keeping with our overall premise of the general 'maladaptive' nature of perfectionistic strivings. It may, however, point to the possibility that in times of stress and failure, individuals high in perfectionistic strivings are vulnerable to psychological distress, and may explain why Personal Standards and Self-Oriented Perfectionism shared no relationship with maladaptive academic variables (Hewitt & Flett, 1993). Accordingly, the present findings reiterate the continuing complexity of this construct and the importance of future research in this area.

Perfectionistic Concerns and Successful Learning

Contrary to our hypothesis, but consistent with Madigan (2019), we did not find that all measures of perfectionistic concerns had a negative association with academic performance. Discrepancy appeared to have the most harmful effect. This is unsurprising, as the subscale focuses on the distress caused due to differences between one's standards and actual performance. Doubts about Actions additionally shared a negative effect on academic performance. However, it is surprising to note the lack of relationship between academic performance with Concerns over Mistakes and Socially Prescribed Perfectionism. There were similar findings for helpful outcomes indicative of successful learning. Discrepancy once again appeared to have the strongest negative impact on buffering the effects of outcomes typically associated with academic success, whilst all other measures of perfectionistic concerns seemed to have no maladaptive impact on outcomes commonly aiding successful learning. This is inconsistent with previous research establishing the maladaptive nature of these two measures in mental health outcomes (Limburg et al., 2017; Smith et al., 2018) and as such, our results suggest perhaps the characteristics of Discrepancy have the most harmful impact in educational settings.

As predicted, all dimensions of perfectionistic concerns showed a small to strong positive relationship with maladaptive learning outcomes such as test anxiety, procrastination and academic burnout, with Discrepancy again the strongest predictor. Given the strong relationships these unhelpful academic outcomes hold with general psychological distress in previous literature (i.e., Limburg et al., 2017), it is unsurprising that all the perfectionism measures were positive predictors in this context. Taken together, our results indicate perfectionistic concerns do promote unhelpful learning outcomes, and the characteristics of Discrepancy appear to be particularly maladaptive and should accordingly be targeted in intervention work.

Limitations and Future Research

The results of this study should be interpreted in the context of the following limitations. First, a large number of the studies included in the meta-analysis were cross-sectional in nature, which, whilst informative in terms of comparative effect sizes, ultimately limits the causal conclusions that can be drawn with regard to the effects of perfectionism on successful learning. Indeed, only two out of the 67 studies included in this analysis were longitudinal in nature (Damian et al., 2017; Rice et al., 2006a). This is a commonly identified problem in most meta-analytic studies within the field of perfectionism (Limburg et al., 2017) and has been a longstanding limitation in the inferences we can make with respect to understanding the construct of perfectionism and implications it has on mental health and well-being. Further studies are required that not only measure the longitudinal effects of perfectionism with regard to learning, but also the effects of manipulating such perfectionism through experimental design. Second, our samples were limited to academic-related variables and students, and as such, our results may not generalise to populations with the absence of constant performative evaluation and emphasis on achievement inherent in academic environments.

A third limitation was the broad inclusion of various outcomes used to encompass the idea of successful learning in the education sphere. Previous research guided the categorization of outcomes to ensure that helpful and unhelpful academic variables were not only related with academic performance but had small-large associations with each other (i.e., see Hattie, 2008, for an extensive review). For example, procrastination and test anxiety are known to have strong positive correlations (van Eerde, 2003), whereas self-regulated learning strategies and academic self-efficacy have been shown to be related to academic adjustment (Cazan, 2012). Nevertheless, it is possible the current grouping and exclusion of outcomes in this analysis may not be the most optimal categorization to define this broad concept. The idea of successful learning is an important avenue for future research, and thus we call for work in this area to clarify the concept of successful learning in an academic realm. In the same vein, we restricted the inclusion of perfectionism measures to the most commonly used measures within the literature and future consideration of pertinent new measures is required.

A fourth limitation was the high level of heterogeneity was observed, which was unsurprising given the different perfectionism subscales included. This commonly indicates the need to conduct moderator analyses. With an average benchmark of ten primary studies needed to evaluate moderator variables (Dalton & Dalton, 2008), we did not have sufficient numbers of studies in each categorization, so we were unable to conduct separate moderator (i.e., level of education, giftedness). Further research is thus needed to ensure less biased estimates of effect sizes. In addition, the inclusion of peer-reviewed, published studies in an attempt to reduce the duplication of results may allow the oversight of unpublished or under review studies, as well as buy into the “file drawer” effect (Rosenthal, 1979). Whilst funnel plots were inspected and Egger et al.’s (1997) regression techniques were used to identify publication bias in the current set of studies, it was noted that for perfectionistic strivings and

helpful learning outcomes only, publication bias was present, and our findings should be interpreted as such. It is possible that the file drawer effect has impacted on the average effect size observed for this relationship, and thus reduces our confidence of this estimate. Moreover, 35 studies were identified as relevant for inclusion, but additional data was needed to establish the correlations for separate perfectionism subscales rather than groupings of perfectionism measures to represent the two dimensions. However, only nine of these studies (26%) were able to be included in the current analyses. Given the established evidence of the differential impact of perfectionism subscales in various outcomes (Blasberg et al., 2016; Limburg et al., 2017), our findings should be interpreted with potential missing data in mind.

In terms of future work, highlighting the distinction between pursuit of excellence and pursuit of perfection is a welcome and novel approach for developing a better understanding the nature of perfectionistic strivings (Gaudreau, 2019). We advocate that future research seeks to differentiate pursuit of perfection from pursuit of excellence. While perfectionistic concerns have a strong association with psychopathology, this work will have the benefit of further clarifying the unique role of perfectionistic strivings as a transdiagnostic risk factor for mental health impairment. More complex modelling is required, as the relationship between perfectionistic strivings and increased academic performance cannot be ignored, but this relationship may be moderated by stress (Hewitt & Flett, 1993). Some researchers have suggested that facets of 'conscientiousness' are the key feature in separating healthy strivings of excellence from perfectionism (Blasberg et al., 2016; Hill et al., 2010). Gaudreau (2019), however, strongly argues against the conflation of excellence with conscientiousness given that both excellence and perfectionism are not classified as personality dimensions, but characteristic adaptations that should be separated from personality facets. We suggest that the influence of other variables that may distinguish between perfectionism and excellence

need to be considered such as self-criticism (Dunkley & Blankstein, 2000; James et al., 2015) and self-compassion (Mehr & Adams, 2016).

Whilst intervention studies have shown evidence that targeting perfectionistic strivings can increase well-being (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017), research is yet to investigate the longitudinal effects of an intervention that targets both Discrepancy and the rigid pursuit of perfection, whilst fostering the idea of high standards and excellence. As such, future research should focus on the longitudinal effects of targeting these characteristics on learning and well-being, such as focusing on the benefits of failure whilst striving for high standards of achievement.

Conclusions

The present study provides the first meta-analytic review to examine the differential effects on perfectionism on overall successful learning. The findings suggest perfectionistic concerns, particularly the characteristic of self-criticism from a Discrepancy between one's standards and performance, has the most harmful impact on successful learning. It is also worth noting the differences in measures typically used to assess perfectionistic strivings, with preliminary evidence suggesting the notion of pursing excellence, rather than perfection, should be promoted. Our results highlight the crucial need to target perfectionistic concerns in interventions whilst promoting the pursuit of excellence, and for further work to continue to empirically examine and distinguish perfectionism from excellence. The next chapter now turns to investigating the relationship perfectionism holds with two important psychological processes: self-compassion and self-criticism, in an attempt to further understand this complex construct and inform model development.

Chapter 4

A Systematic Review and Meta-Analysis of the Associations of Perfectionism with Self-Compassion and Self-Criticism

Abstract

Perfectionism is an established transdiagnostic risk factor for various psychological disorders. Evidence suggests self-compassion and self-criticism are important psychological mechanisms that can explain the effects of perfectionism on psychopathology. Thus, the aim of the current review was two-fold: To examine the meta-analytic association between self-compassion and self-criticism on perfectionistic strivings and concerns, and to systematically review the mediating effects of self-compassion and self-criticism on perfectionism and indicators of mental well-being. Our systematic literature search yielded 69 studies and 259 effect sizes across 21,677 participants (M_{age} = 20.64 years). Random-effects models indicated subscales measuring perfectionistic strivings and perfectionistic concerns showed positive associations with self-criticism ($r+$ = .28, $r+$ = .53, respectively), and negative relationships with self-compassion ($r+$ = -.09, $r+$ = -.45, respectively). One exception was the High Standards subscale, which shared a positive association with self-compassion ($r+$ = .24). Lower self-compassion tended to partially mediate the relationship between Discrepancy and psychological distress. The findings suggest self-compassion may counter the harmful effects of perfectionism. The association between perfectionistic strivings with self-criticism and self-compassion questions the notion that such strivings are adaptive. Including self-criticism and self-compassion into future models of perfectionism may inform development of future psychological interventions for perfectionism.

Introduction

While the detrimental associations of perfectionistic concerns with various psychopathological outcomes is well established (Bekes et al., 2015; Kehayes et al., 2019; Smith et al., 2018), perfectionistic strivings have historically been labelled as 'adaptive perfectionism' given positive associations with outcomes such as life satisfaction, positive affect, and lower levels of psychological distress (Chang et al., 2004; Molnar et al., 2006; Mobley et al., 2005). However, a substantial body of evidence also suggests perfectionistic strivings has positive associations with a range of psychopathologies (Limburg et al., 2017). One theoretical reason for the mixed research findings about perfectionistic strivings is the lack of clarity around differentiation between striving for perfection versus striving for high standards within traditional measures of perfectionistic strivings. Further, it is postulated perfectionistic strivings may be harmful due to self-criticism activated in times of failure (Hewitt et al., 2017). Evidence suggests psychological processes such as self-criticism and self-compassion are a key mechanism by which perfectionism exerts harmful effects on psychopathology (Dunkley et al., 2006a, 2006b; Ferrari et al., 2018; Manfredi et al., 2016; Mehr & Adams, 2016; Richardson et al., 2018) and may also help us distinguish the difference between striving for perfection versus striving for high standards.

Main Aims of the Meta-Analysis and Systematic Review

The degree to which self-compassion and self-criticism is associated with perfectionism dimensions is yet to be clarified in a formal review. This is crucial to understand the risk and protective factors that influence perfectionism, as these mechanisms may inform future model development and treatment strategies for perfectionism. The aims of the current investigation were twofold. First, we examined associations between pperfectionistic concerns and perfectionistic strivings with self-compassion and self-criticism and summarised these in a meta-analytic framework, with the aim to investigate moderating

factors of these associations permitting sufficient study numbers (Dalton & Dalton, 2008), namely, population type (clinical versus non-clinical), age, and construct measure (Limburg et al., 2017). Second, to understand whether current evidence supports self-criticism and self-compassion as mechanisms through which perfectionism impacts on psychopathology, we summarised studies that examined mediational pathways involving these variables. Consistent with evidence pertaining to the maladaptive nature of both perfectionistic strivings and perfectionistic concerns (Egan et al., 2011; Limburg et al., 2017), we hypothesized that self-compassion would display negative relationships with both perfectionism dimensions, whilst self-criticism would display a positive relationship. However, consistent with previous evidence and our results in **Chapter 3**, we considered the wording of the High Standards subscale from the APS-R (Slaney et al., 2001) to be more consistent with measuring one's pursuit of excellence rather than a relentless pursuit of perfectionistic standards (Blasberg et al., 2016) and therefore postulated that the High Standards subscale would have positive associations with self-compassion and negative relationships with self-criticism. In our review, we also largely expected to find self-compassion mediating harmful effects of perfectionism on indicators of mental well-being.

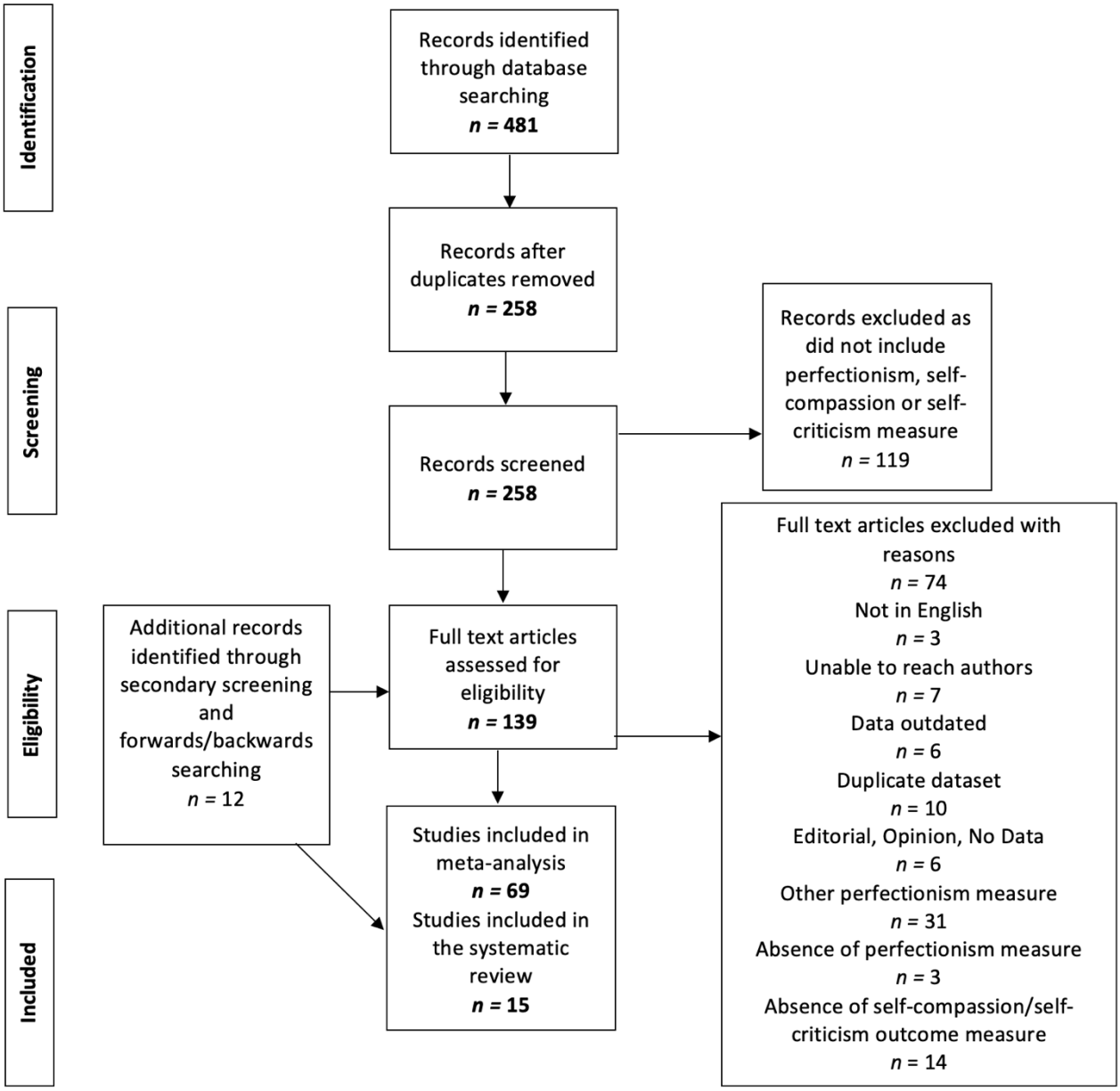
Method

Search strategy

The present study was conducted and reported according to the PRISMA statement (Moher et al., 2009, see **Figure 4.1**). The first author conducted a literature search using four databases: PsycINFO, Medline, Scopus and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) to identify papers that examined the relationship between perfectionism and either self-compassion or self-criticism. The following terms were searched in the title or abstract: (*perfection**) AND (*self-critic* OR self-compassion*).

Figure 4.1

PRISMA Diagram of the Selection Process of Studies Included in the Meta-Analysis and Systematic Review



Inclusion criteria

Studies were included if they met the following criteria: (i) published in English; (ii) included a measurement of perfectionism and either self-compassion or self-criticism, using established, validated self-report scales; (iii) included either an effect size between perfectionism and a self-compassion/self-criticism variable (e.g., correlation coefficient) or included a model examining the mediation of either self-compassion or self-criticism on the relationship between perfectionism and any outcome variable; (iv) were a published journal article, or thesis/dissertation; and (v) included a sample that was not replicated elsewhere (e.g., included in two separate journal articles). When this was the case, only the most complete and recent account of the data was used. No restrictions were placed on study characteristics with regard to participant age, gender, race or ethnicity, and any nation, time period and clinical or non-clinical sample was considered relevant. Studies that were excluded were identified as not eligible for the above reasons and appropriately coded as such (see **Figure 4.1**).

Study Identification

Study eligibility was determined by the examination of titles and abstracts of identified studies using the inclusion-exclusion criteria described above. Inter-rater agreement rate for inclusion between the two judges was 92%. Discrepancies were then resolved via a discussion-based approach to reach a consensus. The first author assessed all remaining studies in full text and coded them.

The search yielded 481 published studies in October 2019 and following the removal of duplicates, 258 remained. Titles and abstracts were screened, and studies that did not examine quantitative associations between perfectionism and either self-compassion or self-criticism were removed, resulting in an examination of 139 full-text articles, with 57 articles meeting inclusion criteria for data extraction. Two additional searches utilizing all databases,

and a forwards/backwards search was conducted on the 15th May 2020, and 26th January 2021, resulting in eleven additional studies. One study was found from a forwards/backwards search. When insufficient data was supplied within the study to extract effect sizes, authors were contacted (N = 31); Twenty-seven (81%) replied and 21 provided additional data. Seven studies were ultimately excluded due to absence of replies from the corresponding authors. In total, 69 studies were included in the meta-analysis. Twelve studies within this sample were included in the systematic review of mediation models involving perfectionism dimensions and self-compassion/self-criticism.

Coding of Studies

A coding sheet was completed for each study included in the meta-analysis and systematic review in the full-text screening process. The coding sheet included: (a) publication information (authors/year), (b) sample size, (c) sample characteristics (including mean age and sample type), (d) the instrument and subscale used to measure perfectionistic concerns and perfectionistic strivings, (e) the measure of self-compassion/self-criticism, (f) the bivariate correlations and 95% confidence intervals between the perfectionism subscale and self-compassion/self-criticism, (g) the instrument used to measure the outcome variable assessing the mediating effect of self-compassion/self-criticism on perfectionism, and (h) the unstandardized/standardized beta coefficient and 95% confidence intervals for the direct effect between perfectionism and self-compassion/self-criticism and indirect mediational effect of self-compassion/self-criticism between perfectionism and the relevant outcome. Coded information for each study is presented in **Table 4.1** (see **Table 4.2** for information pertaining to mediation models included in the systematic review).

Table 4.1.

Characteristics of Studies Included in the Meta-Analysis

Study	Sample			Study Type	Instrument	Measurement				Effect sizes (*r*, 95% CI)			
	Population	*N*	*M*age			PC	PS	Self-Compassion	Self-Criticism	PS-Self-Compassion	PC-Self-Compassion	PS – Self-Criticism	PC-Self-Criticism
Abdollahi et al. (2020)	Clinical sample (depression)	210	25.74	Cross-sectional	APS-R	DIS	HS	SCS		.31 (.18, .43)	-.33 (-.45, -.20)		
Barnett & Sharp (2016) Sample 1	University students	580	NR	Cross-sectional	APS-R	DIS		SCS			-.51 (-.57, -.45)		
Barnett & Sharp (2016) Sample 2	University students	398	NR	Cross-sectional	APS-R	DIS		SCS			-.42 (-.50, -.34)		
Bento et al (2020)	Primary and High School Students	756	13.22	Cross-sectional	CAPS-SF	SPP	SOP		FSCRS[22]			.02 (-.05, .09)	.23 (.15, .30)
Bergunde & Dritschel (2020)	University students	421	20.95	Cross-sectional	HMPS-SF	SPP	SOP	SCS		-.31 (-.39, -.22)	-.41 (-.49, -.33)		
Braver (1996)	University students	336	20.2	Cross-sectional	APS-R	DIS	HS		DEQ-SC			.12 (.01, .22)	.67 (.61, .73)
Campbell (2002) (Study 1)	Clinical Sample (depression, eating disorder) and university students	204	26.32	Cross-sectional	FMPS HMPS	SPP CM DA	SOP Pstan		DEQ-R				.63 (.54, .71) .63 (.54, .71) .48 (.37, .58)
Chun-Kennedy (2017)	University students	614	22	Cross-sectional	APS-R	DIS	HS	SCS[23]		.14 (.06, .22)	-.53 (-.58, -.47)		
Clara et al. (2007)	Clinical Sample (depression)	356	42.3	Cross-sectional	HMPS FMPS	SPP CM DA	SOP Pstan		DEQ-R			.26 (.16, .35) .16 (.06, .26)	.47 (.38, .55) .57 (.50, .64) .48 (.40, .56)
Clark & Coker (2009)	Community Sample - Children	110	13.19	Cross-sectional	FMPS	CM DA			LOSC			.22 (.03, .39)	.61 (.48, .72) .56 (.42, .68)
Cox et al. (2009) Sample 1	Community Sample	271	NR	Longitudinal	HMPS FMPS	SPP CM DA			DEQ-R				.53 (.44, .61) .47

[22] Correlation was an average between two subscales: Inadequacy and Hatred
[23] Correlation was an average between two factors: self-disparagement and self-care

											(.37, .58) .61 (.53, .68) .58 (.50, .65) .53 (.44, .61) .68 (.61, .74)
Cox et al. (2009) Sample 2	Community Sample	281	NR	Longitudinal	HMPS FMPS	SPP CM DA		DEQ-R			
Cox et al. (2001)	Clinical sample (depression, panic disorder)	76	39.10	Cross-sectional	HMPS		SOP	DEQ-R		.30 (.08, .49)	
Curran et al. (2017)	Community Sample - Adolescents	316	15.68	Cross-sectional	HMPS FMPS	SPP CM DA		DEQ-R	.52 (.43, .60) .52 (.43, .60) .45 (.36, .53)		
DeRosa (2000)	High School Students	127	18	Cross-sectional	CAPS	SPP	SOP	DEQ-SC		.03 (-.15, .20)	.34 (.18, .49)
Donaldson et al. (2000)	Adolescents (suicide attempt)	68	15	Cross-sectional	CAPS	SPP	SOP	DEQ- SC		.27 (.03, .48)	.57 (.38, .71)
Dunkley & Blankstein (2000)	University students	233	21.01	Cross-sectional	HMPS	SPP	SOP	DEQ-SC		.20 (.07, .32)	.48 (.37, .57)
Dunkley et al. (2006)a	University students	527	20.34	Cross-sectional	HMPS	SPP	SOP	DEQ-SC		.20 (.12, .28)	.46 (.39, .52)
Dunkley et al. (2006)b	University students	163	20.02	Longitudinal	HMPS FMPS	SPP CM DA	SOP Pstan	DEQ-SC		.42 (.28, .54) .32 (.17, .45)	.57 (.46, .67) .68 (.59, .75) .59 (.48, .68)
Dunkley & Kyparissis (2008)	Community sample	223	40.11	Cross-sectional	HMPS	SPP	SOP	DEQ-SC DAS-SC[24]		.40 (.27, .50) .41 (.28, .51) .32 (.19, .43)	.52 (.41, .61) .69 (.62, .75) .52 (.49, .66)
Dunkley et al. (2012)	Clinical sample – angiography patients	123	66.38	Cross-sectional	FMPS		Pstan	MDEQ		.23 (.06, .39)	
Dunkley et al. (2017)	Clinical sample (depression)	63	40.94	Longitudinal	HMPS FMPS APS-R	SPP CM DIS	SOP Pstan HS	DEQ-SC			
Enns & Cox (1999)	Clinical Sample (depression)	145	43.6	Cross-sectional	FMPS HMPS	SPP CM DIS	SOP Pstan	DEQ-R		.29 (.13,.43) .16 (-.00, .31)	.50 (.37, .61) .61 (.50, .70) .50

[24] Correlations averaged across the two outcomes

													(.37, .61)
Ferrari et al. (2018) Sample 1	High School Students	541	14.1	Cross-sectional	CAPS	SPP		SCS-SF		-.44 (-.51, -.37)	-.49 (-.55, -.42)		
Ferrari et al. (2018) Sample 2	Community sample	515	25.22	Cross-sectional	FMPS	CM DA		SCS		-.27 (-.34, -.19)	-.68 (-.72, -.63) -.55 (-.61, -.49)		
Fletcher et al. (2019)	Clinical Sample (Bipolar Disorder)	302	44	Cross-sectional	APS-R-SF	DIS		SCS			-.55 (-.62, -.47)		
Flett et al. (2012) Sample 1	University students	207	18.53	Cross-sectional	HMPS FMPS	SPP CM DA	SOP Pstan		ATSS-SC			.38 (.26, .49) .40 (.28, .51)	.36 (.24, .47) .48 (.37, .58) .42 (.30, .53)
Flett et al. (2012) Sample 2	University students	112	19.56	Cross-sectional	HMPS FMPS	SPP CM DA	SOP Pstan		ATSS-SC			.49 (.33, .62) .44 (.28, .58)	.34 (.16, .49) .38 (.21, .53) .28 (.10, .44)
Flett et al. (2012)	High School Students	105	16.49	Cross-sectional	CAPS	SPP	SOP		DEQ-A-SC			.21 (.02, .39)	.36 (.18, .52)
Fong & Cai (2019)	Primary School Students	1042	NR	Cross-sectional	APS-R-SF	DIS	HS	SCS-SF		.28 (.22, .34)	-.09 (-.15, -.03)		
Gautreau et al. (2015)	University students	301	20.87	Longitudinal	FMPS	CM DA			DEQ-R				.60 (.52, .67) .63 (.56, .69)
Gilbert et al. (2006)	University students	126	23.6	Cross-sectional	HMPS	SPP	SOP		FSCRS[25]			.12 (-.06, .28)	.45 (.30, .59)
Grzegorek et al. (2004)	University students	273	19.87	Longitudinal	APS-R	DIS	HS		MDEQ			.02 (-.10, .14)	.57 (.48, .66)
Harvey et al. (2015)	University students	158	NR	Longitudinal	HMPS		SOP		DEQ-SC			.56 (.44, .66)	
Hayes et al. (2016)	University students	1609	22.74	Cross-sectional	APS-R	DIS	HS	SCS-SF		.04 (-.01, .10)	-.64 (-.67, -.61)		
Hill et al. (2010)	Male athletes	255	15.51	Cross-sectional	FMPS HMPS	CM DA	PStan		ATSS-SC			.43 (.32, .53)	.38 (.27, .48) .34 (.23, .44)
Hoiles et al. (2016)	Clinical Sample (depression,	32	34.54	Cross-sectional	FMPS	CM DA	PStan		DAS-SC			.27 (-.09, .57)	.77

[25] Correlation was an average between two subscales: Inadequacy and Hatred

	anxiety, eating disorder, obsessive-compulsive disorder, panic disorder)												(.58, .88) .54 (.24, .75)
James & Rimes (2018)	University students	65	NR	Experimental	FMPS	CM	Pstan	SCS		-.27 (-.48, -.03)	-.57 (-.71, -.38) -.31 (-.52, -.07)		
James et al. (2015)	Community sample	381	27.92	Cross-sectional	FMPS	CM DA		SCS-SF	HINT	-.22 (-.31, -.12)	-.62 (-.67, -.54) -.47 (-.54, -.39)	.18 (.08, .28)	.53 (.45, .60) .50 (.42, .57)
Jarrett (2018)	Doctoral Students	218	24.57	Cross-sectional	APS-R	DIS	HS	SCS			-.62 (-.70, -.53)		
Kothari et al. (2019)	Community sample	120	28.9	Experimental	FMPS	CM		FCS		-.32 (-.37, -.15)	-.53 (-.65, -.39) -.22 (-.38, -.04)		
Levine et al. (2020)	University students	658	17.58	Longitudinal	FMPS APS-R	CM DIS	PStan HS		DEQ-SC			.24 (.16, .32) .25 (.18, .33)	.55 (.49, .60) .61 (.56, .66)
Liao et al. (2019)	Community sample	222	28.5	Cross-sectional	APS-R	DIS		SCS-SF			-.61 (-.69, -.52)		
Mahaffey et al. (2016) Sample 1	University students	385	19	Cross-sectional	FMPS	CM			DEQ-R				.61 (.54, .67)
Mahaffey et al. (2016) Sample 2	Clinical Sample (psychiatric inpatients)	188	40.6	Cross-sectional	FMPS	CM			DEQ-R				.58 (.48, .67)
Manfredi et al. (2016)	Community sample	194	35.9	Cross-sectional	FMPS	CM			LOSC				.54 (.43, .63)
Mehr & Adams (2016)	University students	358	18.8	Cross-sectional	APS-R	DIS		SCS			-.51 (-.59, -.46)		
Mistler (2010)	Community sample	309	40.58	Cross-sectional	APS-R	DIS	HS	SCS			-.64 (-.70, -.57)		
Moerk (2002)	Clinical and Community sample (binge eating disorder, depression, Control)	113	46.8	Cross-sectional	HMPS	SPP	SOP		MDEQ			.22 (.04, .39)	.19 (.01, .36)
Moore et al. (2018)	University students	265	19.4	Longitudinal	HMPS		SOP		DEQ-SF			.46 (.36, .55)	
Moroz & Dunkley (2015)	Community sample	210	39.83	Cross-sectional	HMPS-SF FMPS-SF APS-R-SF	SPP CM DIS	SOP Pstan HS		DEQ-SF			.36 (.24, .47) .28	.57 (.47, .65) .61

Nealis et al. (2020)	University students	127	21.0	Cross-sectional	HMPS-SF FMPS-SF	SPP CM DA	SOP Pstan		DEQ-R			(.15, .40) .26 (.13, .38) .18 (.01, .34) .05 (-.13, .22)	(.52, .69) .70 (.62, .76) .30 (.13, .45) .50 (.36, .62) .55 (.42, .66)
Ong et al. (2019)	Community Sample	53	25.4	Experimental	FMPS	CM DA	PStan	SCS		-.49 (-.67, -.25)	-.74 (-.84, -.59) -.37 (-.58, -.11)		
Öngen (2011)	University students	196	19	Cross-sectional	APS-R	DIS	HS		LOSC[26]			.29 (.15, .41)	.46 (.35, .57)
Powers et al. (2011) Sample 1	University students	117	19.12	Cross-sectional	HMPS		SOP		DEQ-SC			.37 (.20, .52)	
Powers et al. (2011) Sample 2	Musicians	72	20.65	Cross-sectional	HMPS		SOP		DEQ-SC			.28 (.04, .49)	
Powers et al. (2011) Sample 3	University students	112	20.71	Cross-sectional	HMPS		SOP		DEQ-SC			.51 (.36, .64)	
Powers et al. (2011) Sample 4	University students	105	20.19	Cross-sectional	HMPS		SOP		DEQ-SC			.43 (.31, .54)	
Powers et al. (2011) Sample 5	Community sample	201	48.38	Cross-sectional	HMPS		SOP		DEQ-SC			.41 (.28, .52)	
Powers et al. (2004)	University students	211	NR	Cross-sectional	HMPS FMPS	SPP CM DA	SOP Pstan		Self-criticism scale (Powers & Zuroff, 1992) DEQ-SC[27]			.13 (-.00, .26) .11 (-.03, .25)	.42 (.30, .52) .19 (.05, .32) .24 (.10, .36)
Powers et al. (2012)	University students	193	20.16	Cross-sectional	HMPS		SOP		DEQ-SC			.57 (.47, .66)	

[26] Correlation was an average between two subscales: comparative self-criticism and internalised self-criticism
[27] Correlations averaged across the two outcomes

Rand-Giovannetti (2020)	University students	280	20.5	Cross-sectional	HMPS FMPS	SPP CM DA	SOP Pstan	SCS[28]		.05 (-.07, .17) .04 (-.07, .16)	-.02 (-.13, .10) -.19 (-.31, -.07) -.12 (-.23, .00)		
Reis & Grenyer (2002)	University students	245	21.38	Cross-sectional	HMPS	SPP	SOP		DEQ-SC			.41 (.30, .51)	.63 (.55, .70)
Richardson et al. (2018)	Doctoral students	119	27.11	Cross-sectional	APS-R	DIS		SCS			-.66 (-.75, -.54)		
Rose et al. (2018)	Opportunity Sample – Self-Critical Participants	23	25.3	Longitudinal	FMPS	CM DA		SCS	SCRS HINT[6]	-.24 (-.59, .19)	-.52 (-.77, -.14) -.21 (-.57, .22)	.48 (.08, .74)	.36 (-.06, .67) .22 (-.22, .58)
Rozental et al. (2017)	Community sample	156	34.1	Experimental	FMPS	CM DA	Pstan	SCS-SF	DAS-SC	-.19 (-.34, .03)	-.49 (-.60, -.36) -.13 (-.28, .03)	.21 (.05, .36)	.67 (.57, .75) .33 (.18, .46)
Seo (2012)	University students	255	24.08	Cross-sectional	FMPS APS-R	CM DA DIS		SCS[29]			-.29 (-.40, -.17) -.26 (-.37, -.15) -.35 (-.50, -.25)		
Shanmugam & Davies (2015)	Athletes	192	21.19	Cross-sectional	FMPS		PS		DAS-SC			.38 (.25, .50)	
Sherry et al. (2016)	University students	524	20.07	Cross-sectional	HMPS-SF FMPS-SF	SPP CM DA			DEQ-R				.40 (.33, .47) .53 (.47, .59) .59 (.53, .64)
Smith et al. (2017)	University students	159	19.9	Cross-sectional	HMPS-SF FMPS-SF	SPP CM DA	SOP Pstan		DEQ-R			.32 (.17, .45) .32 (.17, .45)	.54 (.42, .64) .68 (.59, .76) .51 (.38, .62)
Steele et al. (2011)	Clinical Sample (Eating Disorder)	39	25.2	Cross-sectional	FMPS	CM	Pstan		DEQ-SC			.63 (.39, .79)	.78 (.61, .88)
Stoeber et al. (2020)	University students	311	19.7	Cross-sectional	HMPS-SF	SPP	SOP	SCS-SF		-.28 (-.38, -.17)	-.31 (-.41, -.21)		

[28] Correlations averaged across three subscales: self-kindness, common humanity, mindfulness
[29] Correlations averaged across six subscales: self-kindness, common humanity, mindfulness, isolation, over-identification, self-judgement

Stuart (2009) Sample 1	University students	105	19.09	Cross-sectional	APS-R	DIS	HS	SCS		.01 (-.18, .20)	-.51 (-.64, -.35)			
Stuart (2009) Sample 2	University students	68	19.09	Cross-sectional	APS-R	DIS	HS	SCS		.21 (-.03, .43)	-.45 (-.62, -.24)			
Stuart (2009) Sample 3	University students	8	21.5	Longitudinal	APS-R	DIS		SCS			-.65 (-.93, .10)			
Suh & Chong (2021)	Community sample	245	35.71	Cross-sectional	APS-R	DIS	HS	SCS		.32 (.20, .43)	-.41 (-.51, -.30)			
Taranis & Meyer (2010)	University students	97	21	Cross-sectional	FMPS		Pstan		DEQ-SC			.17 (-.03, .36)		
Thew et al. (2017)	Clinical Sample (Depression, Eating Disorder) and Community Sample	78	NR	Cross-sectional	FMPS	CM DA		SCS-SF	HINT	-.30 (-.49, -.08)	-.60 (-.73, -.44) -.42 (-.59, -.22)	.16 (-.06, .37)	.47 (.28, .63) .46 (.26, .62)	
Trumpeter et al. (2006)	University students	531	19.3	Cross-sectional	HMPS	SPP	SOP		LOSC[30] Self-criticism Scale (Thompson & Zuroff, 2004)			.28 (.21, .36)	.41 (.35, .49)	
Vekas & Wade (2017)	Primary School Students	212	11.1	Quasi-experimental	CAPS		SOP		FSCRS			.11 (-.03, .24)		
Yeshua, et al. (2018)	Community sample	173	31.52	Cross-sectional	FMPS	CM DA	PStan	SCS-SF		-.09 (-.24, .06)	-.56 (-.65, -.45) -.57 (-.66, -.46)			
Wei et al. (2020)	University students	451	NR	Cross-sectional	APS-R	DIS	HS	SCS		.50 (.43, .57)	-.61 (-.66, -.55)			

Note. FMPS = Multidimensional Perfectionism Scale (Frost et al., 1990), HMPS = Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), HMPS-SF = Short Form of the Multidimensional Perfectionism Scale (Cox et al., 2002), CAPS = Child and Adolescent Perfectionism Scale (Flett et al., 2001), , APS-Almost Perfect Scale-Revised (Slaney et al., 2001); PS = Perfectionistic strivings, PStan = Personal standards, SOP = self-oriented perfectionism, HS = High Standards, PC = Perfectionistic concerns, CM = Concern over mistakes, DA = Doubts about actions, SPP = Socially prescribed perfectionism, DIS = Discrepancy; SCS = Self-Compassion Scale (Neff, 2003b); SCS-SF = Self-Compassion Scale-Short Form (Raes et al., 2011) FSCRS = Forms of Self-Criticizing/Self-Attacking and Self-reassuring Scale (Gilbert et al., 2004); DEQ-SC = Depressive Experiences Questionnaire-Self-criticism subscale (Blatt et al., 1976); DEQ-R= Depressive Experiences Questionnaire-Reconstructed (Bagby et al., 1994); LOSC = Levels of Self-Criticism Scale (Thompson & Zuroff, 2004); DEQ-SF = Depressive Experiences Questionnaire-Short Form (Rudich et al., 2008); DAS-SC = Dysfunctional Attitudes Scale-Self-Criticism subscale (Weissman & Beck, 1978); MDEQ = Depressive Experiences Questionnaire-McGill Version (Santor et al., 1997); ATSS-SC = Attitudes Towards Self Scale-Self-criticism subscale (Carver and Ganellen, 1983); HINT= Habitual Index of Negative Thinking (Verplanken et al., 2007); SCRS = Self-critical Rumination Scale (Smart et al., 2015); FCS = Fear of Compassion Scale (Gilbert et al., 2011)

[30] Correlation was an average between two subscales: comparative self-criticism and internalised self-criticism

Table 4.2.

Summary of Mediation Models including Self-Compassion and Self-Criticism Within the Relationship between Perfectionism and Outcomes

Study	Study Design	Perfectionism Subscale	Outcome	Mediation Statistics		Support for Model
				Direct effect (*b*/β, 95% CI)	Indirect effect (*b*/β, 95% CI)	
Self-Compassion						
Barnett & Sharp Sample 1 (2016)	Cross-sectional	DIS	Body image satisfaction	-.02* [a] (95% CI NR)	-.05* [a] (-.07, -.03)	Partial Mediation
Barnett & Sharp Sample 2 (2016)		DIS	Body image satisfaction	-.41* [a] (-.50, -.32)	-.09* [a] (-.14, -.06)	Partial Mediation
		DIS	Eating Concerns	-.41 [a] (-.50, -.32)	NR	No Support
Chun-Kennedy (2017)	Cross-sectional	DIS	Eating Concerns	–.02* [α] (–.02, –.01)	.001* [a] (95% CI NR)	Partial Mediation
		DIS	Depression	–.02* [α] (–.02, –.01)	.002* [a] (95% CI NR)	Partial Mediation
Fletcher et al. (2019)	Cross-sectional	DIS	Depression (self-reported)	*b* -1.62* (95% CI NR)	*b* .07* (.02, .12)	Partial Mediation
		DIS	Depression (clinician reported)	*b* -1.62* (95% CI NR)	*b* .05 (-.03, .12)	No Support
		DIS	Emotion Regulation Difficulties	*b* -1.62* (95% CI NR)	*b* .80* (.6, 1.00)	Partial Mediation
		DIS	Anxiety	*b* -1.62* (95% CI NR)	*b* .08* (0.02, 0.09)	Partial Mediation
Jarrett (2018)	Cross-sectional	DIS	Burnout	β -.41* (95% CI NR)	β .08* (.04, .14)	Partial Mediation

Mehr & Adams (2016)	Cross-sectional	DIS	Depression	-.56*[a] (-.64, -.57)	.10* [a] (.07, .14)	Partial Mediation
Richardson et al. (2018)	Cross-sectional	DIS	Burnout	β -.03* (95% CI NR)	β .26* (.09, .46)	Partial Mediation
		DIS	Depression	β -.03* (95% CI NR)	β.16* (.07, .25)	Partial Mediation
Stoeber et al. (2020)	Cross-sectional	SOP	Subjective Wellbeing	β -.18* (–.31, –.05)	β –.09* (–.16, –.04)	Full Mediation
		SPP		β -.23* (–.36, –.09)	β –.11 (–.19, –.04)	Full Mediation
Stuart (2010)	Cross-sectional	DIS	Disordered eating	*b* -.09* (95% CI NR)	*b* .12* (.02, .12)	Partial Mediation
Wei et al. (2020)	Cross-Sectional	DIS	Depression	*b* -.12* (-.13, -.10)	*b* .27* (.22, .32)	Partial Mediation
		HS	Depression	*b* .17* (.11,.24)	*b* .47* (-.54, -.28)	Partial Mediation
Self-Criticism						
Chun-Kennedy (2017)	Cross-sectional	DIS	Eating Concerns	.04* [a] (.03, .04)	.005[a] (95% CI NR)	Partial Mediation
		DIS	Depression	.02* [a] (.03, .04)	.02 [a] (95% CI NR)	Full Mediation
Manfredi et al. (2016)	Cross-sectional	CM	Depression	β .69* (95% CI NR)	β .15* (0.07, 0.26)	Full Mediation
Taranis & Meyer (2010)	Cross-sectional	PStan	Compulsive Exercise	NR	NR[b]	Full Mediation

Note. **p* < .05. PStan = Personal Standards, SOP = Self-Oriented Perfectionism, HS = High Standards, PC = Perfectionistic concerns, CM = Concern Over Mistakes, DA = Doubts About Actions, SPP = Socially Prescribed Perfectionism, DIS = Discrepancy

[a] indicates *b* or β was not specified.

[b] partial mediation was found with ΔR^2 .08* after controlling for PStan

Perfectionistic Strivings and Perfectionistic Concerns Perfectionism

The process of choosing perfectionism measures and classifying subscales into meaningful groups for analysis was guided by the recommendations of Stoeber and Otto (2006), and previous meta-analytic studies on perfectionism (e.g., Limburg et al., 2017). Subscales from the three most common measures were used (FMPS, Frost et al., 1990; HMPS, Hewitt & Flett, 1991; APS-R, Slaney et al., 2001; refer to **Table 3.1** in **Chapter 3** for classification of subscales). Studies utilizing the CAPS subscales, which were originally adapted from the HMPS to use in youth (Flett et al., 2016) were also included and merged with the HMPS subscales due to their strong relationship, as demonstrated by previous factor-analytic studies (e.g., Cox et al., 2002). Following recommendations from previous literature (Stoeber & Otto, 2006; Cox et al., 2002), FMPS-Organisation, HMPS-Other-Oriented Perfectionism, and APS-R-Order were excluded due to a lack of clarity on their classification. FMPS-Parental Expectations and Parental Criticism were additionally excluded due to evidence suggesting these aspects of perfectionism are predominantly related to preceding factors involved in upbringing (Stoeber & Otto, 2006).

Meta-Analytic Procedures

All studies examining the relationship between a perfectionism subscale and a self-compassion or self-criticism variable reported zero-order correlation coefficients, *r*. As such, the zero-order correlation coefficient was selected as the effect size metric. Following recommendations, all analyses were performed using Fisher's *Z* scale (Borenstein et al., 2009). Fisher's *Z* results were subsequently back-transformed and reported to the appropriate correlation coefficient for ease of interpretation. Cohen's (1992) recommendations were used to interpret small ($r = .10$), medium ($r = .30$), and large ($r = .50$) effects. Random-effects models are considered to allow generality beyond the present set of studies to future studies (Schmidt et al., 2009), and were used to derive effect sizes and 95% confidence intervals. For

studies that reported multiple effect sizes for self-criticism and self-compassion, the average weighted effect size was used to avoid overrepresentation of these studies, inflation of sample size and distortion of standard error estimates (Lipsey & Wilson, 2001). Analyses were conducted using Comprehensive Meta-Analysis software (Version 3.3; Borenstein et al., 2005).

Forest plots were produced using *r* values and 95% confidence intervals (CI) and Fisher's *Z* was calculated for each individual study to evaluate heterogeneity. Higher scores on both self-compassion and self-criticism reflected a greater level of each variable respectively. Heterogeneity, the indication of whether the variability in effect sizes within the included studies is greater than what would be expected due to random error alone (Cuijpers, 2016), was evaluated using the Q statistic, a measure of weighted squared deviations around the weighted mean effect size, and the I^2 statistic, whereby 25%, 50%, and 75% suggest low, medium and high levels of heterogeneity, respectively (Higgins & Thompson, 2002). Egger's regression intercept (ERI) was also used to assess for publication bias (Moreno et al., 2009), and funnel plots were generated to detect any asymmetry (Borenstein et al., 2009).

Results

Studies Included in the Meta-Analysis and Systematic Review

In total, 69 studies and 21,677 participants were included in the meta-analyses (M_{age} = 20.64 years). The population was diverse (university students *n* = 39; community/non-clinical sample *n* = 19; clinical sample *n* = 13; primary/high school students *n* = 6; doctoral students *n* = 2; male athletes *n* = 1). Nine studies used a longitudinal design. The most utilized perfectionism measure was the FMPS (*n* = 38, 37%), followed by HMPS (*n* = 36, 35%), APS-R (*n* = 22, 22%), and CAPS (*n* = 6, 6%). Overall, 259 effect sizes across 82 independent samples were included in the analysis (see **Table 4.1** for correlations, study coding and results for all studies included in the meta-analysis).

Of the 69 studies, 12 (13 samples) met the inclusion criteria for the systematic review of mediation models, on 22 different outcomes (see **Table 4.2** for mediation statistics). All studies were cross-sectional in nature, with majority investigating the mediational effect of self-compassion on perfectionism and varying outcomes (n = 9), and three examining the mediating role of self-criticism. Outcome type and measure differed between studies but was centered around psychopathological indicators. As measures and outcomes greatly differed between studies, the empirical evidence for these models was collapsed and synthesized into sections pertaining to the dimensions of perfectionistic strivings and perfectionistic concerns.

Perfectionistic Strivings: Relationship with Self-Compassion and Self-Criticism

Self-compassion had a small-medium positive relationship between High Standards, and negative relationships with both Self-Oriented Perfectionism and Personal Standards (see **Table 4.3** and **Figure 4.2**). Based on the 95% confidence intervals, there were no substantial differences between Self-Oriented Perfectionism and Personal Standards. Our analyses indicated small-to-medium positive relationships between self-criticism and all subscales of perfectionistic strivings (see **Table 4.3** and **Figure 4.3**). Subgroup analyses examining the overlap of 95% confidence intervals suggested that all subscales had similar effects.

Table 4.3

Average Effect Sizes and 95% Confidence Intervals for Subscales of Perfectionism and Self-Compassion/Self-Criticism, and Analysis of Heterogeneity (Q;I^2) and Publication Bias (ERI) for Each Perfectionism Dimension and Outcome Category

Perfectionism subscale	Self-Compassion					Self-Criticism				
			Heterogeneity and Publication Bias					Heterogeneity and Publication Bias		
	r+	95% CI	Q-test[a]	I^2 – test[a]	*ERI* (95% CI)[b]	*r*+	95% CI	Q-test[a]	I^2 – test[a]	*ERI* (95% CI)[b]
Perfectionistic Strivings	-.09*	-.17, -.02	482.42*	96.39	-3.10 (-7.6, 1.45)	.28*	.25, .32	284.15*	78.88	2.84* (1.10, 4.60)
High Standards	.24*	.11, .35	117.36*	94.04	1.32 (-6.67, 9.32)	.24*	.14, .33	25.33*	76.31	6.84 (-0.16, 14.93)
Personal Standards	-.22*	-.31, -.13	30.97*	70.94	-1.01 (-4.44, 2.41)	.28*	.23, .33	63.28*	65.23	1.66 (-0.72, 4.04)
Self-Oriented Perfectionism	-.24*	-.44, -.05	49.68*	93.96	23.81 (-14.09, 61.71)	.32*	.26, .37	188.04*	84.05	3.41* (0.63, 6.20)
Perfectionistic Concerns	-.45*	-.50, -.39	672.98*	93.76	0.70 (-0.99, 2.40)	.53*	.55, .62	508.97*	83.69	1.33 (-0.52, 3.18)
Discrepancy	-.50*	-.59, -.40	355.09*	95.49	-0.20 (-6.65, 6.25)	.60*	.54, .66	13.99*	57.11	-0.13 (-8.60, 8.36)
Concerns over Mistakes	-.54*	-.64, -.42	109.23*	90.85	0.36 (-5.75, 6.46)	.56*	.52, .60	151.70*	81.54	1.98 (-1.05, 5.01)
Doubts about Actions	-.35*	-.46, -.23	82.58*	87.89	2.40 (-2.60, 7.40)	.50*	.41, .60	121.58*	82.73	-2.11 (-5.81, 1.59)
Socially Prescribed Perfectionism	-.32*	-.49, -.12	52.91*	94.33	25.58 (-6.99, 58.16)	.46*	.41, .51	134.95*	81.48	2.36 (-0.68, 5.39)

Note. *$p < .05$.
[a] Indicates tests of heterogeneity.
[b] Indicates publication bias where ERI = Eggers' regression intercept.

Figure 4.2

Forest Plot of the Relationship Between Subscales of Perfectionistic Strivings and Self-Compassion. Favours A = Less Self-Compassion, Favours B = Greater Self-Compassion.

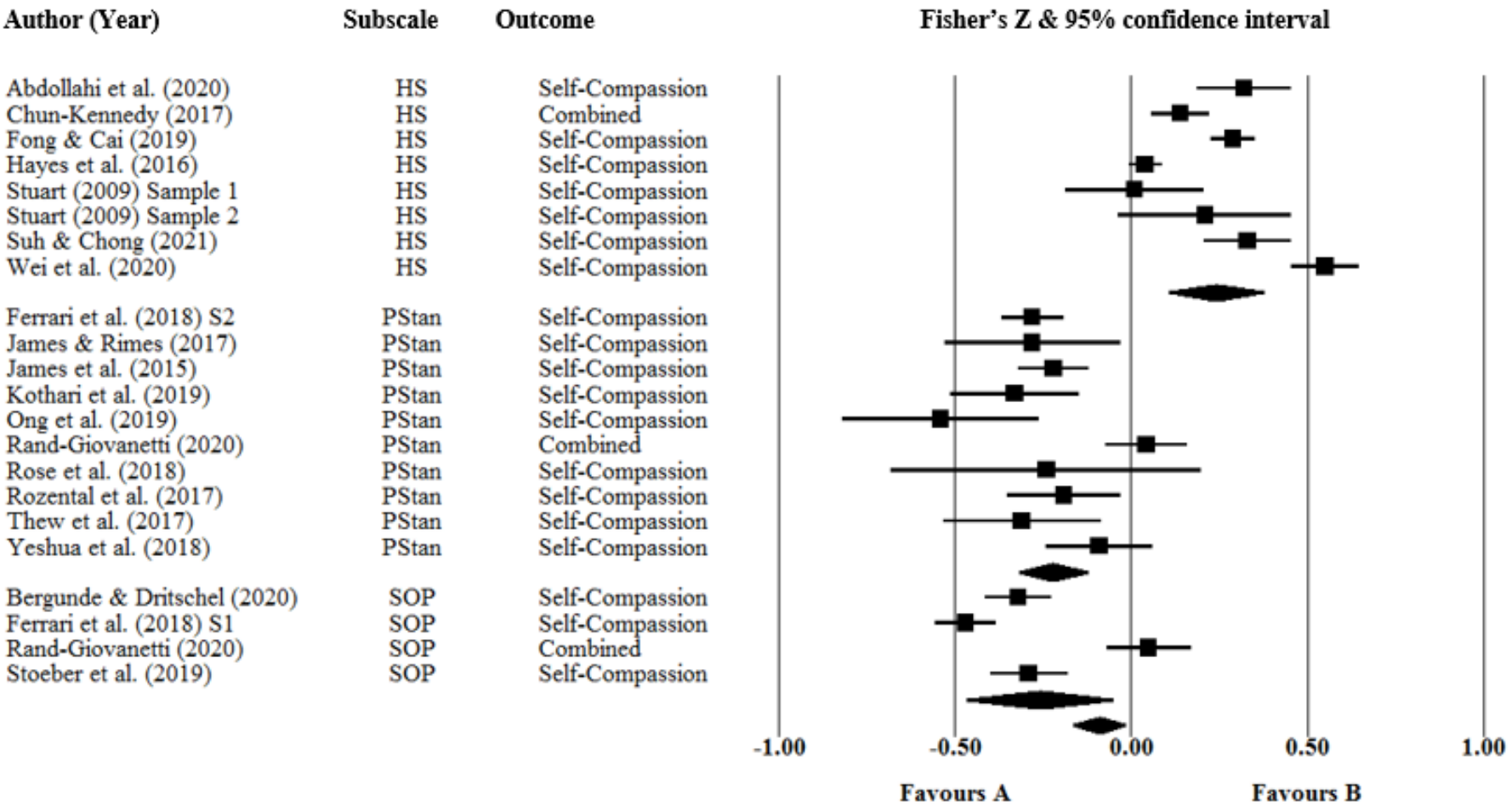
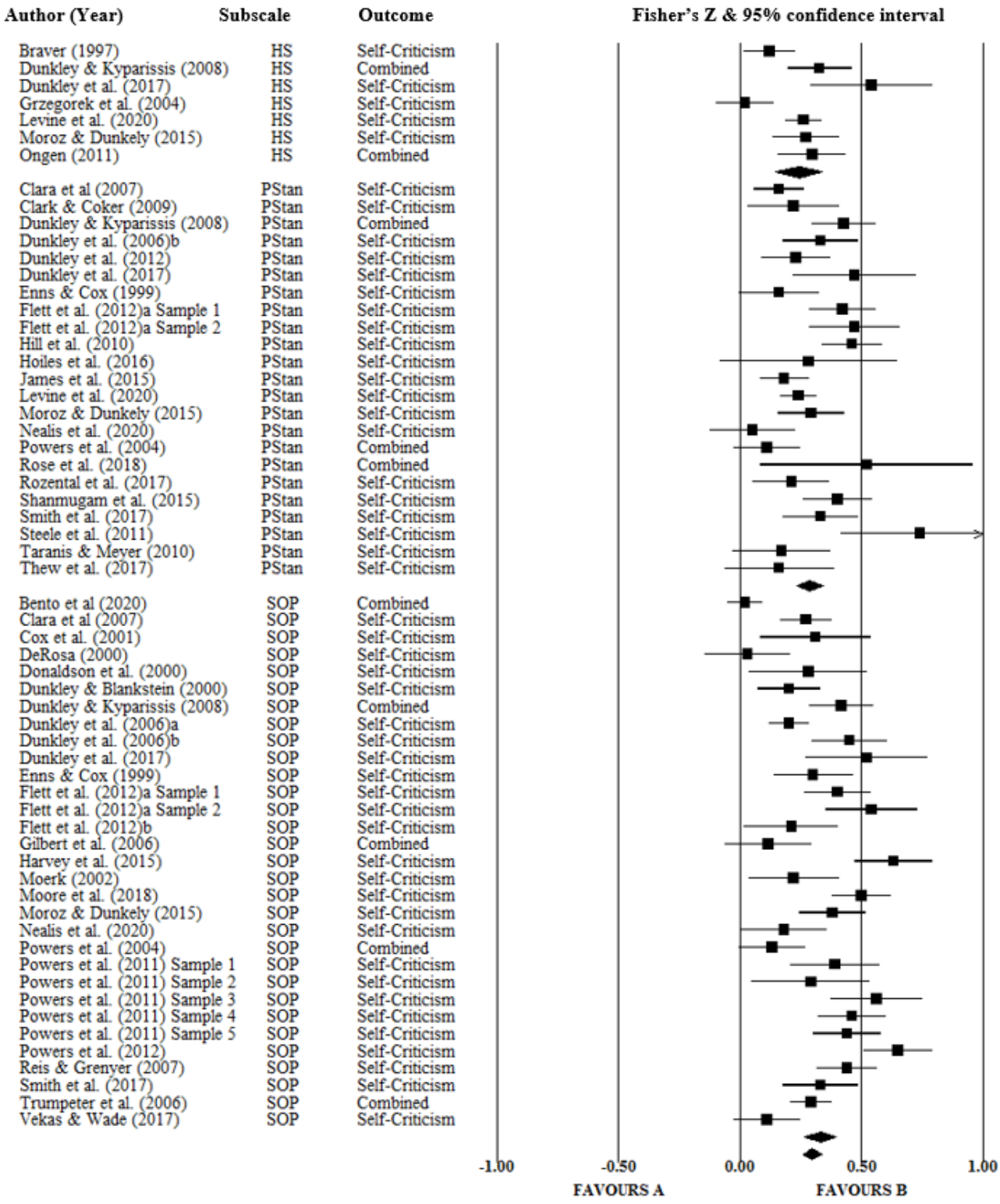


Figure 4.3

Forest Plot of the Relationship Between Subscales of Perfectionistic Strivings and Self-Criticism. Favours A = Less Self-Criticism, Favours B = Greater Self-Criticism.



Perfectionistic Concerns: Relationship with Self-Compassion and Self-Criticism

As predicted, our analyses indicated all perfectionistic concerns subscales showed medium-to-large negative relationships with self-compassion (see **Table 4.3** and **Figure 4.4**). The overlap of 95% confidence intervals revealed that these effects were not dependent on the perfectionism measure, with no substantial differences found between subscales. In addition, our analyses revealed that all perfectionistic concerns subscales displayed medium-to-large positive relationships with self-criticism (see **Table 4.3** and **Figure 4.5**). Of note, subgroup analyses examining the overlap of 95% confidence intervals suggested that Discrepancy had a stronger effect on self-criticism in comparison to Socially prescribed Perfectionism. No other substantial differences were found between the remaining subscales.

Heterogeneity

An analysis of the heterogeneity of the total weighted mean effects indicated the probability of factors extraneous to sampling error were responsible for the observed variability across effect sizes ($Q = 9401.16$, $p < .001$). The I^2 statistic indicated a high degree of heterogeneity (98.01%). As such, additional subgroup analyses were used to explore the sources for observed heterogeneity by calculating Q and I^2 for each perfectionism dimension, and self-compassion and self-criticism category separately. Further analyses revealed high, but ultimately decreased degrees of heterogeneity for each subgroup (see **Table 4.3** for Q and I^2 values for all categories). This supports the usefulness of focusing on the observed effect sizes for each perfectionism subscale rather than each perfectionism dimension.

Figure 4.4

Forest Plot of the Relationship Between Subscales of Perfectionistic Concerns and Self-Compassion. Favours A = Less Self-Compassion, Favours B = Greater Self-Compassion.

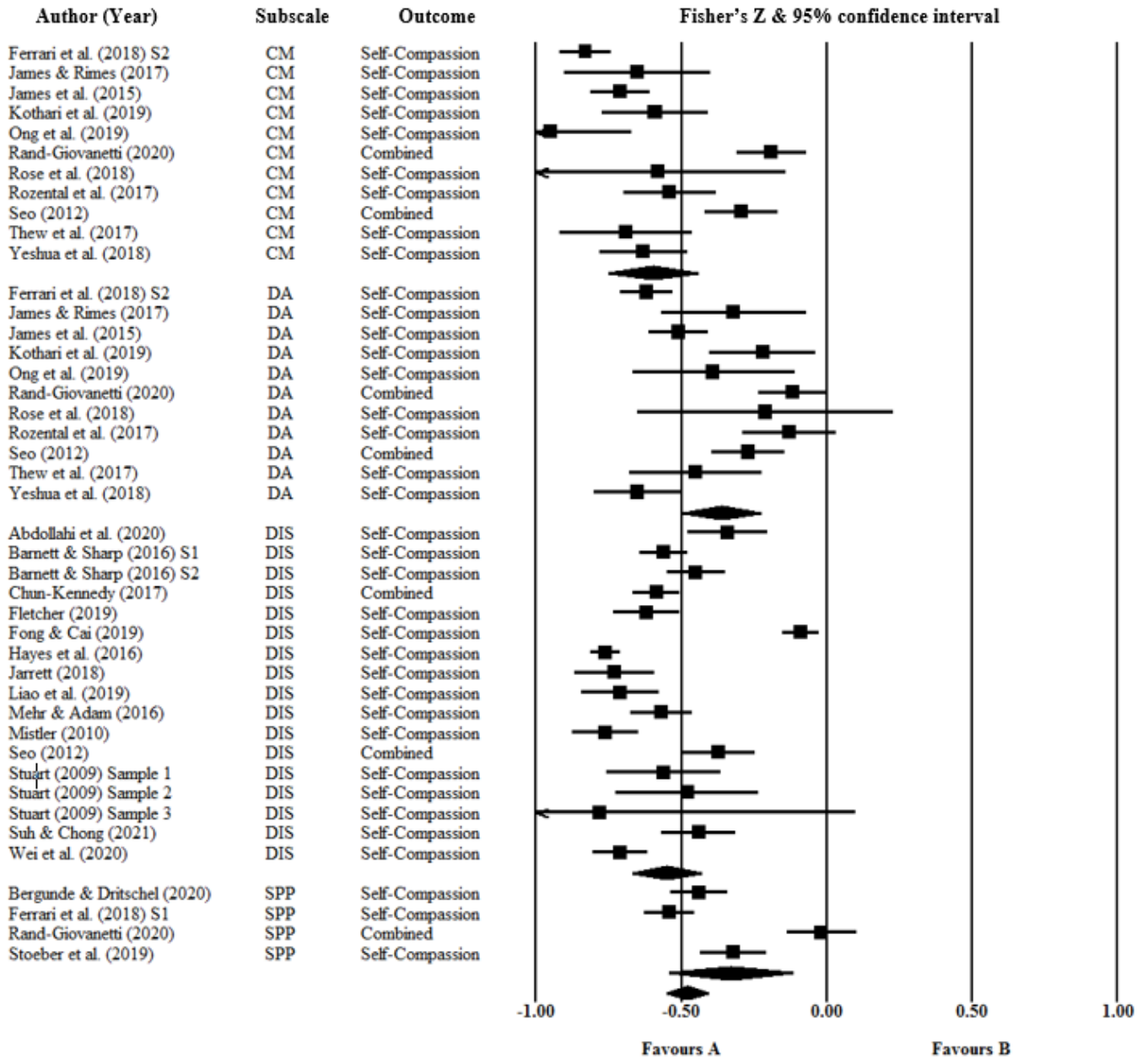
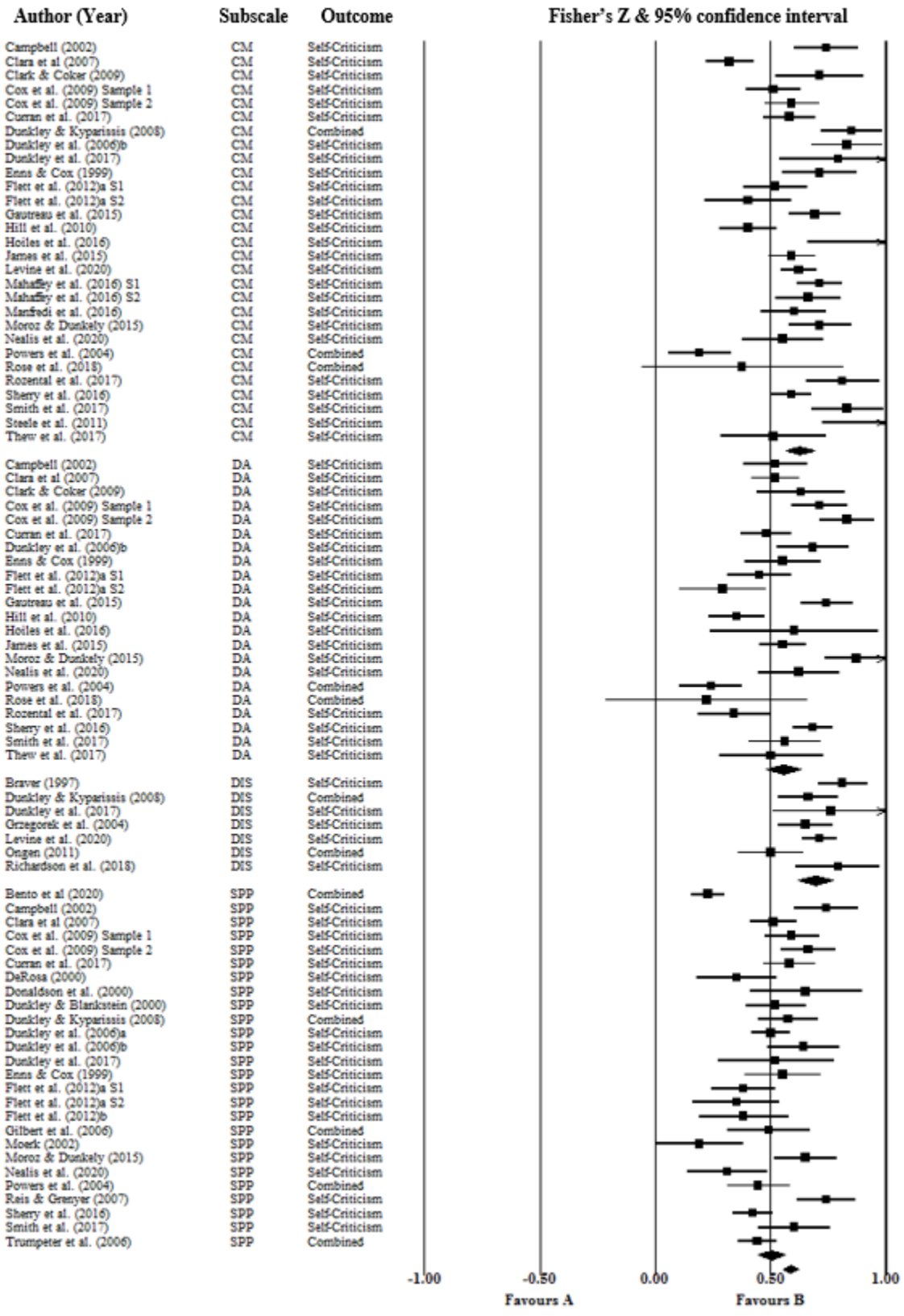


Figure 4.5

Forest Plot of the Relationship Between Subscales of Perfectionistic Concerns and Self-Criticism. Favours A = Less Self-Criticism, Favours B = Greater Self-Criticism.



To assess publication bias, a *p* value of <. 05 was used as the metric, as it indicates a significant relationship between the effect size and precision. Funnel plots were generated for the relationship between perfectionistic strivings and concerns with self-compassion and self-criticism (**Figures 4.6-4.9**). Additionally, the 95% confidence interval of Egger's regression coefficient was indicative of publication bias if it was not greater than zero (Laird et al., 2017). Studies were initially combined in a single analysis, which indicated publication bias (*ERI* = 5.54, $p < .001$). However, when studies were grouped by perfectionism dimension and outcome category (self-compassion, self-criticism), publication bias was detected for perfectionistic strivings when grouped with self-criticism only (see **Table 4.3** for ERI values across all categories). Further analyses revealed publication bias was only present for Self-Oriented Perfectionism and self-criticism (*ERI* = 3.41, $p = .018$) Thus, estimates of the relationship between Self-Oriented Perfectionism and self-criticism need to be interpreted cautiously.

Figure 4.6

Funnel Plot for the Relationship between Studies Examining Perfectionistic Strivings and Self-Compassion

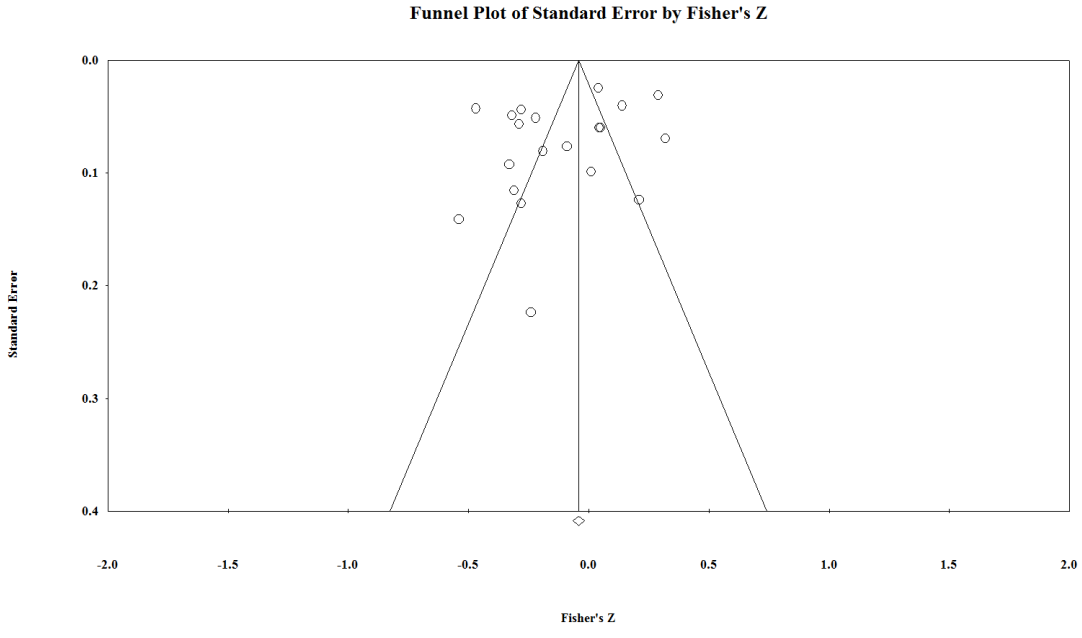


Figure 4.7

Funnel Plot for the Relationship between Studies Examining Perfectionistic Strivings and Self-Criticism

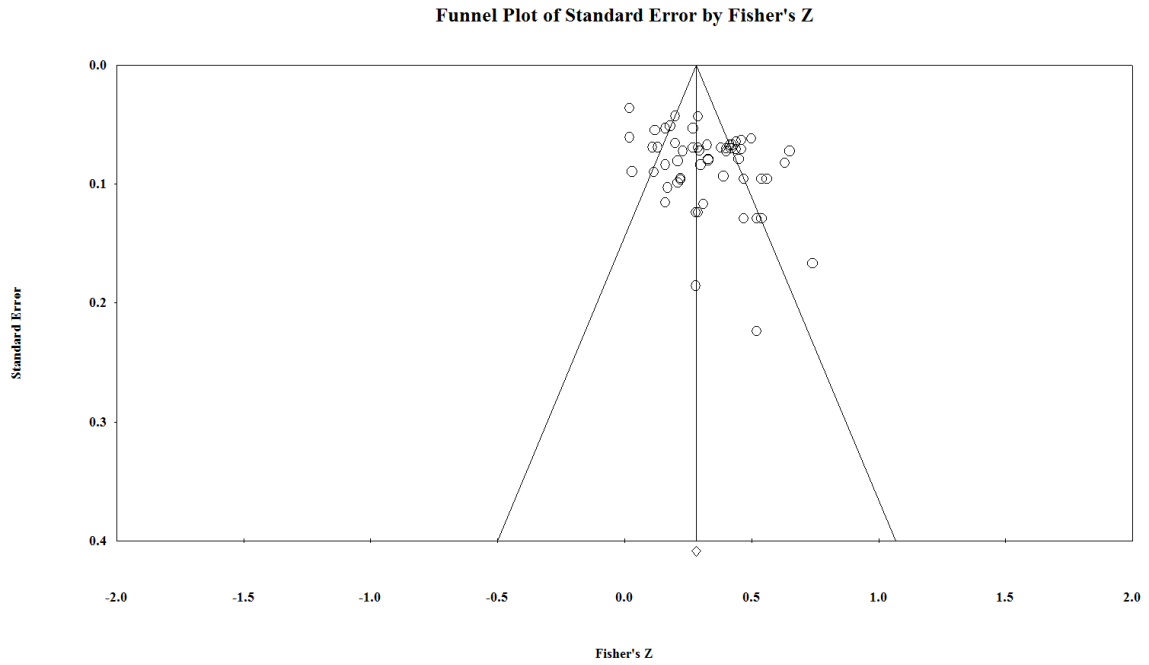


Figure 4.8

Funnel Plot for the Relationship between Studies Examining Perfectionistic Concerns and Self-Compassion

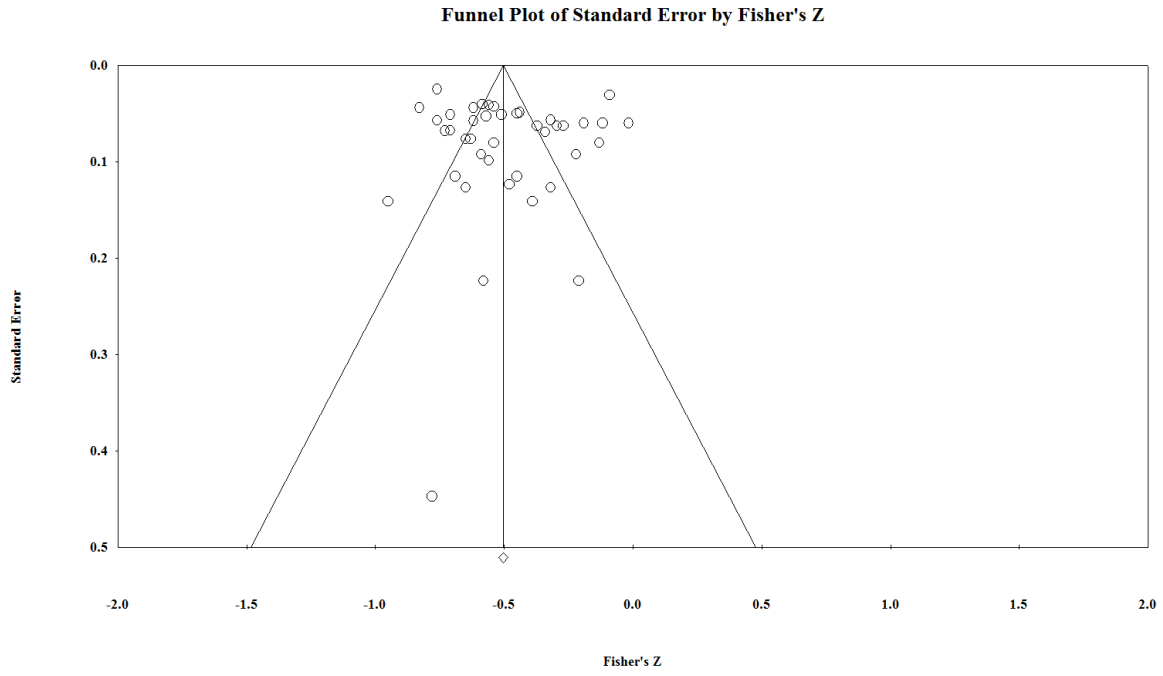
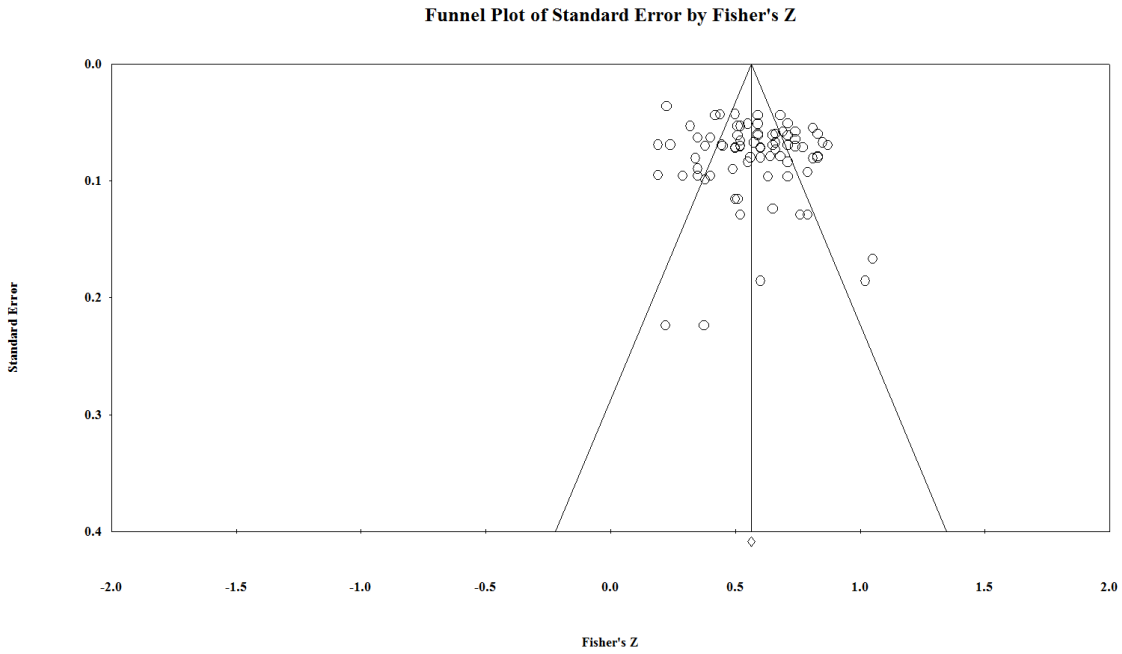


Figure 4.9

Funnel Plot for the Relationship between Studies Examining Perfectionistic Concerns and Self-Criticism



Mediation Models for Perfectionistic Strivings and Perfectionistic Concerns

Fifteen of the 22 mediation models supported partial mediation between measures of perfectionism and various outcomes, suggesting that perfectionism has an independent relationship with outcomes over and above the role of self-criticism or self-compassion. Three studies examined the mediating impact of self-criticism (n = 1) and self-compassion (n = 2) of perfectionistic strivings on subjective wellbeing, compulsive exercise and depression. All studies found support for a partial or full mediating effect of self-compassion or self-criticism. Ten studies, containing 19 models, investigated the mediating impact of self-compassion (n = 16) or self-criticism (n = 3) on the relationship between perfectionistic concerns subscales and various outcomes (see **Table 4.2** for relevant statistics). Discrepancy was the most frequently used measure within the models (n = 17), with fifteen models finding evidence for self-compassion either partially or fully mediating and buffering the harmful

effects of Discrepancy on psychopathological outcomes (Body image satisfaction: Barnett & Sharp, 2016; Depression: Chun-Kennedy, 2017, Fletcher et al., 2019, Mehr & Adams, 2016, Richardson et al., 2018, Wei et al., 2020; Burnout: Jarrett, 2018; Disordered eating: Chun-Kennedy, 2017, Stuart, 2009; Anxiety and emotion dysregulation: Fletcher et al., 2019). One study examined the effect of self-disparagement as a mediator (Chun-Kennedy, 2017) supporting partial mediation of the harmful effects of Discrepancy on depression and eating concerns. Conversely, two models found no support for the mediating role of self-compassion respectively in university students for eating concerns (Barnett & Sharp, 2016) and clinician-reported depression for patients with bipolar disorder (Fletcher et al., 2019).

Two models investigated whether self-compassion and self-criticism mediated the relationship between other subscales of perfectionistic concerns (socially prescribed perfectionism, and concerns over mistakes, respectively) and outcomes. Both found support for self-compassion fully mediating and buffering the harmful impacts on subjective wellbeing (Stoeber et al., 2020) whilst self-criticism fully mediated the harmful effects on depression (Manfredi et al., 2016).

Quality Assessment

The quality of included studies was assessed using the Cochrane Risk of Bias Tool (Higgins et al., 2011), in order to inform the critique of current literature. Bias arising to the randomization process and deviations from intended interventions could not be considered in understanding the quality of cross-sectional and correlational studies. Therefore, these studies were assessed using only the remaining three criteria (bias in missing data, bias in measurement of the outcome, and bias of selection of the reported result). Of the 69 studies, only one received a strong quality score rating, 53 were rated as having ‘some concerns’, and 14 were rated as ‘high risk’. The major limitation within almost all studies (n = 67) was the

absence of pre-specified intentions of cross-sectional studies. Other areas of concern included outcome assessors aware of the intervention received by study participants (n = 3).

Discussion

The objective of this review was to examine the quantitative relationship of perfectionism with self-compassion and self-criticism and provide a comprehensive narrative review of the mediating and moderating effect of these variables. As predicted, both perfectionistic strivings and perfectionistic concerns shared a negative relationship with self-compassion and positive relationship with self-criticism, supporting previous findings within the literature (MacBeth & Gumley, 2012; Zelkowitz & Cole, 2018; Limburg et al., 2017).

The Relationship between Perfectionism with Self-Compassion and Self-Criticism

Overall, both perfectionistic concerns and perfectionistic strivings dimensions displayed medium-large negative relationships with self-compassion and medium-large positive relationships with self-criticism. Given the maladaptive nature of perfectionism with regard to psychopathological outcomes in previous literature (i.e., Egan et al., 2011; Limburg et al., 2017; Smith et al., 2018), and evidence pertaining to self-compassion holding great promise as a means of addressing psychological risk factors while self-criticism exacerbates these difficulties, these results are largely unsurprising. Importantly, our work directly contradicts the portion of literature pertaining to the ‘adaptive’ nature of perfectionistic strivings (Hill et al., 2016; Madigan, 2019; Stoeber & Otto, 2006). Rather, our findings further confirm the maladaptive nature of both perfectionism dimensions in clinical settings and highlights the crucial need to target all facets of perfectionism in intervention work (Limburg et al., 2017).

With regard to specific perfectionistic concerns subscales and self-compassion, no notable differences within subscales were found, suggesting all facets of perfectionistic

concerns (i.e., extreme concerns over making mistakes, the feeling of being discrepant due to having fallen short of expectations and one's standards, having doubts about one's work) share similar harmful relationships with self-compassion. These findings fit within the empirical and theoretical conceptualisations of self-compassion being associated with less fear of failure and fostering greater resilience in the face of personal shortcomings (Neff et al., 2005). It is also not surprising that all perfectionistic concerns subscales were found to share strong positive relationships with self-criticism, particularly Discrepancy (the discrepant feelings when having fallen short of one's standards) displaying a stronger relationship than other subscales (i.e., Socially prescribed Perfectionism). Our research also revealed that all perfectionistic strivings subscales shared a medium positive relationship with self-criticism, with no substantial differences between measures. The unique exception was the High Standards subscale which uniquely shared a positive relationship with self-compassion.

High standards, self-criticism and self-compassion

Previous research has suggested that High Standards from the APS-R does not reflect the 'all or nothing' thinking and rigid pursuit of perfection, and rather reflects a healthy striving for high standards that has little to do with the core definition of perfectionism (Blasberg et al., 2016). This is supported by previous meta-analytic findings in **Chapter 3** that High Standards may capture more of a healthy pursuit of high standards rather than reflect a rigid striving for perfection. High Standards also served as a protective factor against outcomes such as test anxiety, academic burnout and stress compared to other perfectionistic strivings subscales. As such, it may be that High Standards reflect a healthier striving for high standards characterised by a compassionate view of the self when standards are not met, whilst a relentless and rigid pursuit of perfection may be better reflected by other perfectionistic strivings subscales. This simple conclusion should be interpreted with caution,

however, as High Standards had a positive relationship with self-criticism, which suggests the component of setting high standards for oneself is also likely to be met with criticism when these standards are not met. As such, our findings reiterate that striving for perfection and high standards are complex dimensions and further work is critical in this area to differentiate and better understand this construct.

Implications for Model Development

Mediation models were synthesised to further investigate the role self-compassion and self-criticism play as protective and risk factors. Overall, low levels of self-compassion were found to be a mechanism through which Discrepancy exerts harmful effects on psychopathological outcomes. This broadly supports the cultivation of self-compassion which may then "block" or act as a preventative factor in reducing the impact of perfectionism on poor mental health. Taken together, this accumulating evidence warrants the serious consideration of self-compassion as a mediator as part of a proposed model for perfectionistic concerns, and further reiterates that perfectionism holds an independent harmful relationship with psychopathology.

In terms of perfectionistic strivings, findings were mixed. Increased levels of self-compassion were a key mechanism through which High Standards exerted a helpful impact in academic settings (Fong & Cai, 2019), whilst lower levels of self-compassion fully explained the harmful effects of Self-Oriented Perfectionism on subjective well-being (Stoeber et al., 2020). This suggests self-compassion may be a factor in explaining the adaptive and maladaptive outcomes associated with strivings. Self-criticism was investigated in only four mediation models, which showed self-criticism either partially or fully mediating the harmful effects of both strivings and concerns on psychopathological indicators. Nevertheless, these findings do provide preliminary evidence to suggest self-criticism plays an important role

within the harmful nature of perfectionism, consistent with the CBT model of clinical perfectionism that proposes self-criticism as a mediator (Shafran et al., 2002).

Limitations of This Review and Future Directions

The results of this study should be interpreted in the context of the following limitations. First, most studies included in the meta-analysis were cross-sectional, which ultimately limits the causal conclusions that can be drawn with regards to the relationship perfectionism holds with self-compassion and self-criticism. Moreover, all mediation models identified in the review were cross-sectional, and thus can be considered as exploratory only. We call for further work to place an importance in conducting longitudinal and experimental research in targeting perfectionism.

A second limitation was the moderate to high level of heterogeneity observed within all analyses. With an average benchmark of ten primary studies needed to evaluate moderator variables (Dalton & Dalton, 2008), we did not have enough studies in each subgroup analysis categorisation (i.e., perfectionism subscale and self-compassion/criticism outcome grouping), so were unable to conduct separate analyses predicting the moderating effect of variables (i.e., clinical vs. non-clinical populations, mean age, self-compassion/self-criticism measure). Nevertheless, these moderator variables are important to consider in future research as they provide information with respect to the degree to which perfectionism is associated with self-compassion and self-criticism within different populations, and when using different measures, which can be used to refine theoretical modelling and interventions.

Further to this, it was beyond the scope of this review to systematically review the moderating role of self-compassion and self-criticism in the relationship between perfectionism and mental health outcomes. This is important to consider, as self-compassion has been found to buffer the harmful effects of perfectionistic concerns on depressive symptoms (Abdhollai et al., 2020), while self-criticism strengthens the harmful effects on

psychological maladjustment (Sherry et al., 2016). To date, no studies have systematically examined the moderating role of these variables in a review. Examination of these variables as moderating factors is encouraged to gain a better understanding of the role self-compassion and self-criticism play in buffering or exacerbating the effects of perfectionism on psychopathology, and hence inform treatment strategies.

Third, self-compassion was predominantly measured using total score of the Self-Compassion Scale (Neff, 2003b) or Self-Compassion Scale Short-Form (Raes et al., 2011), which measures both positive and negative indicators of self-compassion. However, there is some debate in the literature with regard to using the total score of the SCS given recent findings suggest negative indicators of self-compassion show a significantly stronger association with psychopathology compared to positive indicators alone, and thus the use of the total scales may provide an overestimation of the protective role that self-compassion plays (Muris & Petrocchi, 2017). However, other studies have directly compared the model fit of the total SCS versus a 2-factor (i.e., positively worded items and negatively worded items) and concluded a total score is more appropriate for use (Neff et al., 2019). In a similar vein, all self-criticism measures were included provided they have been validated and widely used within the literature. A recent systematic review (Rose & Rimes, 2018) highlighted inconsistencies within self-criticism measures in terms of their design, structure and content, which may ultimately influence the conclusions drawn in research settings.

Finally, whilst there was an adequate response rate for data requests, 12 studies were unable to be included due to non-response/outdated data and our findings should be interpreted with this potential missing data in mind.

Conclusions

The present study provides the first meta-analytic review to examine the differential effects of perfectionism on self-compassion and self-criticism and investigate the mediating

impact of these variables on the relationship between perfectionism and varying outcomes. The findings suggest perfectionistic concerns and strivings shared negative relationships with self-compassion and positive relationships with self-criticism. Low levels of self-compassion partially explained the harmful effects of the Discrepancy between one's standards and performance on psychopathology. It is also worth noting the differences in measures typically used to assess perfectionistic strivings, with preliminary evidence suggesting the notion of pursing high standards, rather than perfection, could be promoted. This, taken with the aforementioned limitations, suggest a need for further research that can be used to inform targeted prevention approaches. The following chapter will now turn to describing the measures that were used in subsequent chapters that investigated the structure of perfectionism using exploratory and confirmatory techniques, and a pilot study and a 5-lesson intervention program aimed at targeting perfectionism while cultivating a healthy striving for high standards, by targeting self-criticism and fostering self-compassion.

Chapter 5

Measures

Overview

The measures used in **Chapters 6, 7** and **8** are outlined in **Table 5.1**. The following measures were selected due to evidence pertaining to their psychometric validity of the constructs of interest, described below.

Table 5.1.

List of Measures Utilised in Chapters 6-8, with Internal Reliability

Chapter	Measure	Internal Reliability (Coefficient H)
6	FMPS– Personal Standards	.85
	APS-R– High Standards, Discrepancy	.87, .92
	HMPS-SF – Self-Oriented Perfectionism	.90
	SCS-SF	.82
	WEMWBS	.95
	DASS-21	.95
	AMS – Intrinsic Motivation	.96
7	APS-R– High Standards, Discrepancy	.89, .95
	SCS-SF	.86
	WEMWBS	.88
	DASS-21	.91
	AMS – Intrinsic Motivation	.91
	Program evaluation of intervention	-
8	FMPS– Personal Standards	.86
	APS-R– High Standards, Discrepancy	.85, .90
	HMPS-SF – Self-Oriented Perfectionism	.90
	SCS-SF	.81
	WEMWBS	.92
	DASS-21– Depression, Anxiety	.93, .93
	AMS – Intrinsic Motivation	.95

Note. FMPS = Frost Multidimensional Perfectionism Scale, APS-R = Almost Perfect Scale-Revised, HMPS-SF = Short form of Hewitt Multidimensional Perfectionism Scale, SCS-SF = Short Form of Self Compassion Scale, WEMWBS = Warwick Edinburgh Mental Wellbeing Scale, DASS-21 = 21 item Depression Anxiety and Stress Scale, AMS = Academic Motivation Scale.

Due to limitations with the unrealistic assumptions underlying Cronbach's alpha and recommendations for the use of other metrics of reliability (McNeish, 2018), Coefficient *H* was computed as an indicator of internal reliability at baseline. Coefficient *H* is conceptually similar to Cronbach's alpha (Pallant, 2013), so the results can be interpreted in a similar fashion, with values ≥ .9 considered excellent internal reliability, ≥ .8 considered good internal reliability, ≥ .7 considered acceptable internal reliability, and < .7 as questionable.

Description of the Measures

Perfectionism

Given considerations of respondent burden, not all the subscales of the following measures were used in the research reported in this thesis. Specifically, only subscales measuring self-directed perfectionism were included, as we wished to observe change in response to our universal prevention that did not include significant others. A rationale for the choice of specific subscales, reported in **Table 5.1**, is given at the end of each description of the questionnaire.

Almost Perfect Scale-Revised (APS-R)

Description. The APS-R (Slaney et al., 2001) is a 23-item questionnaire divided into three subscales: High Standards, Discrepancy, and Order. Items are rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). High Standards assesses adaptive endeavor for high standards e.g., "I try to do my best at everything I do" while Discrepancy measures the gap between personal high standards and actual performance e.g., "Doing my best never seems to be enough". The third subscale, Order, measures concern for organization and order e.g., "Neatness is important to me". Higher scores on each subscale reflect greater perfectionism, with the mean item total score being computed for this thesis.

Reliability. The APS-R has been validated for use in child and adolescent samples (Leone & Wade, 2018). In a sample of gifted middle school students aged 11-15, the High Standards and Discrepancy subscales had respectable-to-very good internal consistency ranging between α= 0.79 and 0.89 (Vandiver & Worrell, 2002). Similar results have been found in other studies assessing the psychometric properties of the APS-R in children and adolescents (M_{age} = 12.29 years), with internal consistency ranging between α = 0.81 and 0.89 (Sastre-Riba et al., 2016). Test-retest reliability is yet to be formally conducted in an adolescent age group.

Validity. Construct validity has been established in children between the ages of 11-15 via correlations with academic performance (Nounopoulos et al., 2006; Vandiver & Worrell, 2002), coping strategies (Nounopoulos et al., 2006) and life satisfaction (Gilman & Ashby, 2003), with Discrepancy demonstrating a maladaptive association with aforementioned variables, while High Standards displaying a moderate-strong positive association. However, given that different outcomes have been observed between two different samples for the Order subscale (Slaney et al., 2002) and that this subscale has reported relatively lower internal consistency (α = 0.68), this subscale is often excluded from many analyses due to continued unclarity with its psychometric properties.

Factor Structure. The 3-factor structure of the APS-R has been supported in several studies utilising both exploratory and confirmatory factor analytic techniques in child and adolescent samples (aged 11-15), with no invariance between gender and age reported (RMSEA = .049, CFI = .89, TLI = .89, Sastre-Riba et al., 2016; RMSEA = .064, CFI = .88 TLI = NR, Vandiver & Worrell, 2002). With regard to the 2-factor structure of perfectionism using multiple measures of perfectionism, both Stornæs and colleagues (2019) and Sironic and Reeve (2015) found the Discrepancy subscale loaded on the “perfectionistic concerns”

factor and High Standards loaded on the "perfectionistic strivings" factor using a sample of 12–18-year-old adolescents (RMSEA = .05 for both studies).

Choice of Subscales. Accordingly, the research described in this thesis excluded the Order subscale from the analyses and utilised the High Standards (7 items) and Discrepancy (12 items) subscales. These subscales were used in **Chapters 7-9.**

Frost Multidimensional Perfectionism Scale (FMPS)

Description. The FMPS (Frost et al., 1990) is a 35-item questionnaire widely used to measure six dimensions of perfectionism: Concerns over Mistakes, Doubts about Actions, Personal Standards, Organisation, Parental Expectations and Parental Criticism. Respondents are asked to rate their response on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores on each subscale reflecting greater perfectionism. Concerns over Mistakes captures the overvaluation of the importance of making mistakes and attribution of such mistakes to failure e.g., "I should be upset if I make a mistake". The Doubts about Actions subscale assesses one's fear with regard to their abilities e.g., "Even when I do something very carefully, I often feel that it is not quite right". Personal Standards measures one's extent to set very high personal standards of performance e.g., "It is important to me that I am thoroughly competent in everything I do". The Organisation subscale measures the extent of preference for neatness and Organisation e.g., "I try to be an organised person". Parental Criticism assesses the extent to which the respondent perceives criticism from their parents e.g., "As a child, I was punished for doing things less than perfectly". The Parental Expectation subscale measures the respondent's perception that their parents have a propensity to live up to exceedingly high expectations e.g., "My parents set very high standards for me".

Reliability. Previous research has established good internal consistency for the use of the FMPS in children and adolescents (Leone & Wade, 2018). For example, in a sample of young Spanish adolescents (M_{age} = 13.36), Gavino et al. (2019) found all subscales demonstrated acceptable-excellent internal consistency ranging between α= 0.71 and 0.92. In the same sample, test-retest reliability was appropriate, with intraclass correlations ranging between .70-.85. These results mirror findings from other studies using child and adolescent samples between the ages of 12-16 (Clark & Coker, 2009; Hawkins et al., 2006).

Validity. In terms of construct validity, all subscales of the FMPS apart from Personal Standards have consistently been associated with lower well-being in a sample of undergraduate students (Sotardi & Dubien, 2019), anxiety in young adolescents (Gavino et al., 2019) and higher neuroticism in 6th grade children (Parker & Stumpf, 1995). While Personal Standards has shown associations with positive outcomes such as GPA (Sotardi & Dubien, 2019) and conscientiousness (Parker & Stumpf, 1995), it has also been shown to be unrelated to well-being (Sotardi & Dubien, 2019) and share positive associations with indicators of psychological distress such as dysfunctional beliefs (Gavino et al., 2019).

Factor Structure. In the original development of the FMPS, Frost et al. (1990) evidenced a six-factor solution in a sample of female undergraduate students, with most subscales highly correlated, apart from the Organisation subscale, which did not load on to the perfectionism construct. However, inconsistencies in the literature remain with finding this factor structure in children and adolescents. Parker & Stumpf (1995) found support for a six-factor solution in a sample of gifted children in the 6th grade, while Hawkins and colleagues (2006) found support for a four-factor model by which Parental Expectations and Parental Criticism loaded onto one factor, with Organisation separate from Personal Standards, and Concerns over Mistakes and Doubts about Actions loading onto another respective factor, in a sample of young female adolescents. These results were similarly

found in a principal components analysis conducted by Stumpf & Parker (2000) in another sample of 6th grade children, and Gavino et al. (2019) using confirmatory factor analytic techniques in a sample of young adolescents (RMSEA = .05, CFI .99, GFI . 98). Ommundsen and colleagues (2005) found that removal of the Organisation subscale greatly improved model fit in their sample of adolescents using a principal components analysis (aged 12-19 years), evidencing a five-factor model for the FMPS. Nevertheless, research has generally supported the greater 2-factor model of perfectionism (i.e., perfectionistic concerns and perfectionistic strivings) using the FMPS in both adult samples (Frost et al., 1993) and adolescent samples aged 12-18 years (Sironic & Reeve, 2015; Stornaes et al., 2019), with the Concerns over Mistakes and Doubts about Actions subscale generally loading on the Perfectionistic Concerns factor and Personal Standards on the Perfectionistic Strivings factor.

Choice of Subscales. Only the Personal Standards subscale was utilised in this thesis. Firstly, it is the mostly commonly used measure of perfectionistic strivings, as described in **Chapter 3-4.** Secondly, in keeping with the thesis aims to differentiate perfectionistic strivings versus high standards, a focus was made to select commonly used subscales of perfectionistic strivings within psychometrically sound multidimensional perfectionism measures for further comparison in later chapters. Findings from **Chapter 3-4** demonstrated that further investigation of differentiation of this subscale from other perfectionistic strivings subscales in an attempt to understand high standards versus perfectionistic standards is warranted. Thus, the Personal Standards subscale will be used in the factor-analytic techniques described in **Chapter 6,** and evaluation of the 5-lesson intervention in **Chapter 8**.

While Concerns over Mistakes and Doubts about Actions have demonstrated sound psychometric assessment and were included as subscales that represent perfectionistic concerns in the reviews presented in **Chapters 3-4,** for ease of delivery, to minimise use of questionnaire fatigue in young adolescents, and to maintain focus on the analysis of

perfectionistic strivings subscales, these two subscales were excluded from analyses. Moreover, Discrepancy was identified as the most harmful subscale for perfectionistic concerns in **Chapters 3-4** compared to Concerns over Mistakes and Doubts about Actions, and thus it was decided that the APS-R subscale would be the representation of perfectionistic concerns compared to other subscales in the FMPS.

The Hewitt Multidimensional Perfectionism Scale (HMPS) – Short Form

Description. The HMPS (Hewitt & Flett, 1991) is a widely used measure to assess self-oriented, other-oriented, and socially prescribed perfectionism and comprises of 45 items rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Self-Oriented perfectionism (15 items) assesses the extent to which respondents personally strive for perfectionistic standards e.g., "I demand nothing less than perfection of myself". Other-Oriented Perfectionism (15 items) assesses the degree to which respondents impose perfectionistic standards on others e.g., "I have high expectations for the people who are important to me". Socially Prescribed Perfectionism (15 items) measures the extent to which individuals strive for perfection due to perceived external pressure from others e.g., "The people around me expect me to succeed in everything I do". Higher scores on each subscale reflect greater levels of perfectionism. Given the length of the HMPS, a brief short form has been created (Hewitt et al., 2008) for ease of delivery and administration.

Reliability. The original HMPS has demonstrated strong psychometric properties in adult samples, with internal consistency ranging between $\alpha = 0.79$-0.86 (Hewitt & Flett, 1991). In their sample of young adolescents (aged 12-13 years) Bong et al. 2014 reported respectable internal reliability for the original HMPS, ranging between $\alpha = 0.73 - 0.82$. While the short form of the HMPS by Hewitt et al. (2008) has been used within research due to the advantages of its shortened length and ease of administration (Graham et al., 2010; McGrath et al., 2012; Nealis et al., 2015; Smith et al., 2015), to date the psychometric assessment of

this short form has not been formally tested (i.e., test-retest reliability, internal reliability), or specifically utilized with child or adolescent samples. However, research has established a respectable relationship between the short form of the HMPS and the original questionnaire in a sample of undergraduate students, evidencing the short-form holds the same relationship with various outcomes as the original questionnaire (Stoeber, 2018), and strong correlations are held between the short-form subscales and original subscales (r = .81-.90; Hewitt et al., 2008).

Validity. Construct validity has been demonstrated for the original HMPS in adolescent and adult populations, with the Self-Oriented and Socially Prescribed subscales of the HMPS correlating strongly with other established perfectionism measures in adult samples (Hewitt & Flett, 2004). Socially prescribed perfectionism has been evidenced to be the most maladaptive, with strong positive relationships with psychopathological outcomes (Hewitt & Flett, 2004). Similarly, in terms of adolescent samples, Bong and colleagues (2014) demonstrated socially prescribed perfectionism to be the most maladaptive, with moderate positive correlations with test anxiety and performance avoidance goals (i.e., striving to achieve to avoid criticism from others). Self-oriented perfectionism was also related to test anxiety albeit to a lesser extent, and strongly positively related to performance approach goals (i.e., striving to achieve with a motivation for the outcome). The short form of the Self-Oriented Perfectionism subscale has demonstrated strong positive associations with helpful outcomes such as conscientiousness but also strong positive associations with detrimental health outcomes such as obsessive-compulsive disorder (Stoeber, 2018), and greater psychosocial impact of physical health symptoms (Flett et al., 2011), in adult samples. It has not yet been utilized in child and adolescent populations.

Factor Structure. While Hewitt & Flett (1991) evidenced a 3-factor structure for the HMPS using a principal components analysis in a sample of adults, only a handful of studies

have since attempted to replicate this factor structure (Cox et al., 2002; DeCuyper et al., 2015). To date, no studies have examined the factor structure of the original or short-form HMPS in children or adolescents. Cox and colleagues (2002) found marginal confirmatory factor analytic evidence for 3-factor structure using the HMPS in their sample college students (RMSEA = .07, CFI = .74, TLI = .72) and clinical adult sample (RMSEA = .07, CFI = .75, TLI = .74). The brief version of the HMPS, however, demonstrated an adequate 3-factor model fit (RMSEA = .05, CFI = .95, TLI = .94). In their sample of undergraduate students, DeCuyper and colleagues (2015) found adequate evidence for a 3-factor structure using a confirmatory factor analysis (RMSEA = .06, CFI = .95) only when an additional factor was included that loaded all negatively worded items, as it has been argued that negatively worded responses may generate artificial response factors that consist exclusively of negatively worded items (e.g., Podsakoff et al., 2003).

Choice of Subscales. The 5-item Self-Oriented Perfectionism subscale from the short-form of this questionnaire were utilized (Hewitt et al., 2008). In keeping with previous justifications for the use of Personal Standards subscale from the FMPS, the Self-Oriented perfectionism subscale will be used to compare perfectionistic strivings subscales in the following chapters to attempt to differentiate high standards from perfectionistic strivings. Evidence has also suggested this subscale has different properties to the High Standards subscale from the APS-R in **Chapters 3-4.** Thus, the Self-Oriented Perfectionism subscale will be used in the factor-analytic techniques described in **Chapter 6,** and evaluation of the 5-lesson intervention in **Chapter 8**.

While the Socially Prescribed Perfectionism scale has demonstrated sound psychometric assessment and were included as subscales that represent perfectionistic concerns in the reviews presented in **Chapter 3-4,** for ease of delivery, to minimise use of questionnaire fatigue in young adolescents, and to maintain focus on the analysis of

perfectionistic strivings subscales, this subscale was excluded from analyses. Moreover, the Socially Prescribed Perfectionism subscale was not as harmful as the Discrepancy subscale from the APS-R, and thus was not included to represent perfectionistic concerns.

Self-Compassion

Self-Compassion Scale Short Form (SCS-SF)

Description. The 26-item, six-subscale Self-Compassion Scale (SCS; Neff, 2003) was developed to assess six components of self-compassion: Self-Kindness (e.g., "I try to be understanding and patient toward aspects of my personality I don't like'), Common Humanity, (e.g., "I try to see my failings as part of the larger human experience"), Mindfulness (e.g., "When something upsets me I try to keep my emotions in balance"), Self-Judgment (e.g., "I'm disapproving and judgmental about my own flaws and inadequacies"), Isolation (e.g., "When I'm feeling down, I tend to feel like most other people are probably happier than I am"), and Overidentification (e.g., "When I fail at something important to me I become consumed by feelings of inadequacy"). Given the length of the original measure, a 12-item short-form has been adapted and validated (SCS-SF; Raes et al., 2011), which was utilized for this study. For the short form, two items from each subscale of the SCS are included based on (i) high correlations with the long SCS scale, (ii) high correlations with the intended SCS subscale, and (iii) high correlations between the two items that accounted for the breadth of the original subscale. Participants provided self-report ratings on a 5-point Likert scale, from 1 (*almost never*) to 5 (*almost always*). In this thesis, a mean item total self-compassion score was computed by reverse-scoring negatively worded items and then summing all 12 items, with higher scores reflecting greater compassion for oneself. Justification for this decision will be described below in the factor structure section.

Reliability. The 12-item SCS has found to highly correlate with the original 26-item SCS in a sample of adults (r = .97; Raes et al., 2011). Cunha et al. (2016) has demonstrated good internal reliability of the 26-item SCS in a sample of adolescents (M_{age} = 15.49), α = 0.88. Other studies using adolescents and the 12-item SCS have similarly reported acceptable internal reliability (aged 14-17 years, α = 0.79, Bluth et al., 2016; aged 11-19 years, α = 0.73, Bluth et al., 2017). Test-retest reliability of the 12 item SCS has not been formally assessed in an adolescent population.

Validity. While the 26-item and 12-item SCS has been used in young adolescent populations when measuring self-compassion, formal demonstration of psychometric validity of this measure in young adolescent populations is scarce (Neff et al., 2021), and while adaptations of measures have been created for use in child populations (i.e., Sutton et al., 2018), no formal measures of self-compassion scales had been validated for specific use in young adolescents at the time of data collection. Moreover, good convergent and divergent validity of this scale has been established in adolescents aged 11-19 years, with moderate positive associations with mindfulness (Bluth et al., 2016) and life satisfaction (Bluth et al., 2017), and moderate-strong correlations with psychological distress (Bluth et al., 2016, 2017) and stress (Galla, 2016).

Factor Structure. To date, no factor analytic techniques have been used for child and adolescent samples for the 12-item SCS. When the 12-item SCS was developed for adult use, Raes and colleagues (2011) reported an overall general higher-order self-compassion factor (RMSEA = .08) with six factors representing each subscale, which was described in the study as an adequate fit. Given the conciseness of the scale, it has been recommended to use the total score rather than analyze separate subscales (Raes et al., 2011). It should be noted the literature has suggested the global construct of self-compassion should be interpreted with caution when using the SCS, as there has been a lack of factor validity for the overall self-

compassion construct, and the positively worded subscales better represent self-compassion while the negatively worded subscales represent self-criticism (e.g., Cleare et al., 2018; Lopez et al., 2015).

However, Neff et al. (2019) criticized the lack of uniformity by which such studies conducted factor-analytic techniques – and in their study compared 1-factor, 2-factor (positive subscales and negative subscales) and 6-factor (i.e., the six subscales) bi-factor models using the original 26-item SCS and a sample of adults. The findings demonstrated support for either a 6-factor structure or the use of an overarching self-compassion score when utilizing the SCS, with no support for a 2-factor model. Similarly, Phillips et al. (2019) investigated the SCS using latent profile analysis using a sample of adults to deduce whether the positive and negative subscales should be used separately. Their findings suggested participants had only three patterns of results – (1) those who reported high in positively worded subscales also reported low in negatively worded subscales, (2) those who reported high in the negatively worded items also reported low in the positively worded items, or (3) an even combination of reporting across the positive and negatively worded subscales. Thus, they concluded that as no individuals scored high or low in both positively and negatively worded subscales, the subscales should be used together as they represent self-compassion. Taken together, the contents of this thesis deemed self-compassion to be best represented by a single factor and combining all 12 items of the SCS-SF.

Mental Well-Being

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS)

Description. The WEMWBS is a 14-item self-report scale designed to measure well-being in general populations using positively worded items attributed to a range of aspects related to positive mental health (Tennant et al., 2007). Participants are asked to rate how

much each statement applied to them over the past two weeks using a 5-point Likert scale, from 1 "*none of the time"* to 5 *"all of the time"*. Examples of statements include "I've been feeling optimistic about the future" and "I've been feeling close to other people". Higher scores on this measure reflect greater general well-being, with the mean total item score computed for this thesis.

Reliability. The WEMWBS has demonstrated sound psychometric properties in populations of young adolescents from 13 years and over. Clarke and colleagues (2011) reported excellent internal consistency, with a Cronbach's alpha $\alpha = 0.87$) in their sample of young adolescents (aged 13-16 years). Tennant et al. (2007) similarly reported sound internal consistency, with Cronbach's alphas of $\alpha = 0.89$ for their student sample (aged 16 years and above) and $\alpha = 0.91$ for a general population sample. In a sample of Australian students aged 13-16, Hunter and colleagues (2015) reported a Cronbach's alpha of $\alpha = 0.87$. Adequate test re-test reliability was also reported over a 3-week period (Tennant et al., 2007).

Validity. In terms of construct validity, the valence of the WEMWBS has demonstrated consistency with its theory in young adolescents: moderate-strong positive associations with self-rated health (McKay & Andretta, 2017), positive affect and life satisfaction (Tennant et al., 2007), other measures of well-being (Clarke et al., 2011), and negative associations with somatic psychopathology (Mckay & Andretta, 2017), negative affect (Tennant et al., 2007), and poor general health (Clarke et al., 2011).

Factor Structure. Factor-analytic evidence has demonstrated support for a single-factor structure for the WEMWBS. Tennant et al. (2007) reported adequate model fit statistics for a single-factor model in their student sample aged 16 years and over (RMSEA = .05, GFI = .93), with all 14 items loading >0.5 onto the single factor. Similarly, Clarke et al. (2011) reported excellent fit statistics for a single-factor structure using confirmatory factor analytic techniques, RMSEA = .003, GFI = 1.00. Hunter et al. (2015) reported marginal

model fit statistics in their sample of Australian students, RMSEA = .08 (CFI = .94, TLI = .92).

Negative Affect

Depression, Anxiety, and Stress Scale (DASS-21)

Description. The 21-item DASS (Lovibond & Lovibond, 1995) is a self-report measure to measure the negative emotional states that commonly accompany depression, stress and anxiety. For each item, participants are asked to choose a number that best describes their experience of a statement over the past week (e.g., *"I felt sad and depressed"*) on a four-point scale from 0 "*did not apply to me at all*" to 3 "*applied to me very much, or most of the time*".

Using the evidence described below, the contents of this thesis used the mean total DASS-21 score to capture the relationship between perfectionism and general negative affect in **Chapter 6,** while the mean total score on the Depression and Anxiety subscales were used in **Chapter 7** and **Chapter 8** to more specifically examine the effects of the perfectionism intervention on depression and anxiety in the sample.

Reliability. The DASS-21 has been extensively used in adolescent populations and has demonstrated psychometric validity. Tully and colleagues (2009) reported excellent internal consistency using the total score of the DASS in their sample of younger adolescents (aged 12-14 years, $\alpha = 0.93$), and acceptable-good internal reliability for separate subscales of depression, anxiety, and stress ($\alpha = 0.79$-0.82). Similarly, Mellor et al. (2015) reported good internal reliability for separate subscales ($\alpha = 0.80$-0.89) in their Australian sample of adolescents aged 12-18 years. Good test-retest reliability has been found for the DASS-21 in a sample of Brazilian children and adolescents (aged 10-19 years) over a 1-week period (Silva et al., 2016).

Validity. In terms of validity, Le and colleagues (2017) found in a sample of adolescents and young adults (aged 15-24 years), all subscales of the DASS-21 to share moderate-strong negative associations with indices of quality of life, and strong positive associations with other measures of depression, anxiety, and psychological distress. Evans and colleagues (2020) similarly found good convergent validity for the depression and anxiety subscales of the DASS-21 in their sample of American adolescents (M_{age} = 15.35), with strong positive correlations with established depression and anxiety measures.

Factor Structure. Evidence of the factor structure for the DASS-21 is mixed and generally supports either use of the DASS-21 for general negative affect or depression and anxiety in adolescents. Studies have evidenced a one-factor model in adolescents aged 11 to 17 years (i.e., DASS to represent general negative affect rather than a 3-factor model to discriminate between depression, anxiety, and stress) to represent the best fit of data using confirmatory factor analytic techniques (Hashim et al., 2011; Patrick et al., 2010), and as such, the use of a single DASS-21 score has been recommended. However, other studies have found that including a general Negative Affect factor using bi-factor techniques allows for the DASS-21 to discriminate between depression and anxiety in adolescents. In a sample of Australian adolescents aged 12-17 years, Shaw et al. (2017) reported excellent fit statistics (RMSEA = .028, CFI = .99) for a 3-factor model with a general negative affect factor. Tully and colleagues (2009) reported a single Negative Affect factor did not adequately represent the data in their confirmatory factor analysis, while a 2-factor model (Depression and Anxiety, excluding Stress) with a general Negative Affect factor had good model fit (RMSEA = .04, CFI = .95). Similarly, Szabo (2010) and Le et al. (2017) reported a common Negative Affect factor with three specific factors of Depression, Anxiety and Stress to be the best fit in a sample of Australian adolescents (RMSEA = .05, CFI = .95; M_{age} = 13.62) and Vietnamese adolescents (RMSEA = .05, CFI = .94; aged 15-24 years), respectively, but both

concluded many items on the Stress subscale failed to load on their respective factor and therefore discouraged the specific use of the stress subscale in adolescents.

Academic Motivation

Academic Motivation Scale (AMS)

Description. The 28-item AMS (Vallerand et al., 1992) was used to measure the type of motivation towards education, as defined by self-determination theory (Deci & Ryan, 2000). It comprises seven subscales; three of which are designed to assess intrinsic motivation (Intrinsic Knowledge, Intrinsic Accomplishment, Intrinsic Stimulation) which is defined as the drive to pursue an activity simply for the derived satisfaction and knowledge. Three subscales are designed to assess extrinsic motivation (External Regulation, Introjected Regulation, Identified Regulation), which postulates that the driving force of behaviour is a sense of obligation or means to an end. One subscale measures amotivation, which is the absence of drive to pursue and activity. Participants are asked to rate each item on a 7-point scale on reasons why they go to school ranging from 1 "*Does not correspond at all*" to 7 "*Corresponds exactly*". An example statement of an intrinsic motivation subscale includes "Because I experience pleasure and satisfaction while learning new things". An example statement of an extrinsic motivation subscale item includes "In order to obtain a more prestigious job later on". An example statement on the amotivation subscale includes "I can't see why I go to school, and frankly, I couldn't care less".

Based on the results described below, the contents of this thesis utilised a mean item total score to measure intrinsic motivation by combining the 12-item three intrinsic subscales (Orientation Towards Stimulating Experiences, Orientation Towards Achievement, Orientation Towards Knowledge) to assess the extent to which students engage in academic activities for self-determined reasons.

Reliability. The AMS has been used extensively in adolescent populations and demonstrated sound psychometric assessment. Haslofça and Korkmaz (2016) found good internal reliability in their sample of adolescents (M_{age} = 15.98) for the total of the intrinsic subscales (α = 0.86) and extrinsic subscales (α = 0.85), but less than adequate reliability for the amotivation subscale. Alivernini and Lucidi (2008) found similar good internal reliability for all subscales int their sample of adolescents (M_{age} = 16.30) ranging between α = 0.81-0.89. Fairchild et al. (2005) reported adequate internal reliability ranging from α = 0.70-0.90. Test-retest reliability for intrinsic and extrinsic subscales has also been deemed appropriate in adolescent populations for a three-week interval (r = .86 - .91; Haslofça & Korkmaz, 2016).

Validity. In terms of convergent and divergent validity, Fairchild et al. (2005) found support for the validity of the AMS in their sample of students (M_{age} = 18 years), with intrinsic subscales sharing positive associations with mastery-oriented measures, while extrinsic subscales were moderately positively correlated with performance and competitive oriented measures. Similarly, Alvernini and Lucidi (2008) demonstrated construct validity in their sample of young adolescents, whereby intrinsic motivation subscale was moderately negatively related to amotivation.

Factor Structure. Factor analyses have generally supported a seven-factor structure and the use of the seven subscales in adolescents (i.e., Haslofça & Korkmaz, 2016; RMSEA = .079, CFI = .95, GFI = .92). Utvær and Haugan (2016) similarly found a marginal model fit when examining the seven-factor structure in their sample of adolescents (M_{age} = 16.80; RMSEA = .074, CFI = .96). However, evidence suggests the combination of the three intrinsic subscales is also appropriate in adolescent samples. In their sample of adolescents aged between 13-15 years, Grouzet and colleagues (2006) demonstrated an adequate model fit (RMSEA = .023, CFI = .94) using a confirmatory factor analysis when loading all intrinsic subscale items on a single factor. This was similarly found in Alivernini and Lucidi's (2008)

study when examining the factor structure of the AMS in a sample of Italian adolescents using a confirmatory factor analysis (M_{age} = 16.35; RMSEA = .06, CFI = .94, TLI = .93).

Program Evaluation of the Intervention

In **Chapter 7**, following the last lesson of the intervention, students were asked to rate the following on a 0–10-point Likert scale with higher scores indicating greater satisfaction/likelihood: *"How would you rate the course in terms of being enjoyable and interesting?", "How much do you think you have learnt during the course?",* and *"In the future, how likely are you to use the ideas you have learnt?".* Using the same rating scale, teachers and school counsellors were asked the following questions: "*How would you rate the course in terms of being enjoyable and interesting <u>for students</u>?",* and *"How much do you think <u>the students</u> have learnt during the course?".*

Chapter 6

A Confirmatory Factor Analysis Investigating the Structure of Perfectionism and High Standards in a Sample of Young Adolescents

Abstract

Perfectionism has adverse impacts on mental health, general well-being, and academic achievement in youth. However, confusion remains with regard to the structure of perfectionism, generally considered to consist of two factors: perfectionistic strivings and perfectionistic concerns. Evidence from previous chapters suggests that a distinction between a perfectionistic strivings and healthy pursuit of high standards exists. Thus, the aim of this study was to clarify the structure of perfectionism in youth. Participants were 282 high school students aged 13-15 years. Exploratory and confirmatory factor analyses on measures of perfectionism were conducted, followed by correlational and regression analyses. Results supported a three-factor model (Concerns, Strivings, High Standards), where High Standards were found to be better understood separately from a general Perfectionism factor. There was factorial invariance identified between males and females. Perfectionistic Concerns had unique associations demonstrating impairments in well-being and academic motivation, while High Standards revealed unique positive associations with well-being. Forty percent of the sample were identified as experiencing perfectionism associated with significantly lower self-compassion (male and female) and well-being (females) and significantly higher negative affect. Results of this study suggest further investigation of the differentiation between high standards from perfection is warranted.

Introduction

Concern has been expressed about the lack of differentiation between striving for perfection and striving for high standards within the factor of perfectionistic strivings (Gaudreau, 2019; Wade, 2018). Specifically, there is debate over whether some measures designed to assess perfectionistic strivings may be partially confounded with the construct of healthy high standards, which is unrelated to the core definition of perfectionism (Greenspon, 2000). Emerging evidence has found the wording of the high standards subscale from the APS-R to be reflective of a healthy pursuit of excellence rather than capturing perfectionistic strivings (Blasberg et al., 2016). Differences in outcomes between perfectionistic strivings subscales have also been found, with the High Standards subscale in **Chapter 3** and **Chapter 4** sharing negative associations with unhelpful academic outcomes, and positive associations with self-compassion. However, to date, no research has formally investigated a factor structure that differentiates a high standards and perfectionistic strivings factor structure examining the most common subscales of perfectionistic strivings.

Below in **Table 6.1** is a summary of all studies to date that have examined the factor structure across multiple measures of perfectionism using the three most commonly used multidimensional perfectionism measures (the HMPS, FMPS, and APS-R), a subset of the more comprehensive **Table 2.1.** As can be seen, only three of eight studies report adequate model fit statistics as per some recommendations (Hu & Bentler, 1999), and only one according to others (Schreiber et al., 2006). This suggests more investigation of the structure of perfectionism is required to test the hypothesis that differences in perfectionistic strivings subscales may be indicated in a better fitting model.

Table 6.1

Summary of All Factor Analytic Studies Utilising the HMPS, FMPS and APS-R

Authors	Sample Type	Model of Choice	Measures	Factors Identified in Model of Choice	Model Fit Statistics		
					RMSEA	CFI	TLI (GFI)
Blankstein et al. (2008)	Undergraduate students	6-factor[31]	FMPS (CM, DA, PStan) HMPS (SOP, SPP) APS-R (HS, DIS)	1. Strivings (PStan, SOP, HS) 2. Concerns (CM, DA, SPP, DIS)	NR	.92	NR (.84)
Dunkley et al. (2012)	Community Sample & Undergraduate students	2-factor	HMPS (SOP, SPP) FMPS (CM, DA, Pstan) APS-R (HS, DIS)	1. Strivings (SOP, PStan, HS) 2. Concerns (CM, DA, SPP, DIS)	.10	.94	NR (.95)
Rice et al. (2005)	Undergraduate students	4-factor	HMPS (SOP, SPP) FMPS (CM, DA, PStan, PE PC, ORG) APS-R (HS, DIS, ORD)	1. Strivings (PStan, HS) 2. Concerns (CM, DA, DIS) 3. Order (ORG, ORD) 4. Social Influences (PE, PC, SPP)	NR	.88	NR
Sironic & Reeve (2015)	High School Students	4-factor	FMPS (CM, DA, PStan, ORG PC, PE) CAPS (SOP, SPP) APS-R (HS, DIS, ORD)	1. Strivings (SOP, PStan, HS) 2. Concerns (CM, DA, DIS) 3. External Pressures (PE, PC, SPP) 4. Order (ORG, ORD)	.06	.90	.90
Smith & Saklofske (2017)	Undergraduate students	2-factor (bi-factor)	HMPS-SF (SOP, SPP, OOP) FMPS-SF (CM, DA, PStan) APS-R (HS, DIS, ORD)	1. Strivings (SOP, PStan, HS, ORD) 2. Concerns (SPP, CM, DA, DIS, OOP)	.05	.99	.98

[31] 6-factor model based on additional factors in the model: self-esteem, personal concerns, academic concerns, and estimated GPA

Suddarth & Slaney (2001)	Undergraduate students	3-factor	HMPS (SOP, SPP, OOP) FMPS (CM, DA, PStan, ORG, PC, PE) APS-R (HS, DIS, ORD)	1. Strivings (Pstan, SOP, HS, OOP) 2. Concerns (CM, DA, DIS, SPP, PE, PC) 3. Order (ORG, ORD)	NR	NR	NR
Wang & Zhang (2017)	Undergraduate students	3-factor	HMPS (SOP, SPP) FMPS (CM, PE) APS-R (HS, DIS, ORD)	1. Strivings (SOP, HS) 2. Concerns (SPP, CM, PE, DIS) 3. Order (ORD)	.07	.93	NR (.92)
Zhang & Cai (2012)	Undergraduate students	3-factor	HMPS (SOP, SPP) FMPS (CM, DA, Pstan, PE, ORG) APS-R (HS, DIS, ORD)	1. Strivings (SOP, PStan, HS) 2. Concerns (Disc, SPP, CM, DA, PE) 3. Order (ORD, ORG)	.10	.90	.88

RMSEA = root- mean-square error of approximation, CFI = comparative fit index, TLI = Tucker-Lewis index, GFI = goodness-of-fit index, FMPS = Multidimensional Perfectionism Scale (Frost et al., 1990), FMPS-SF = Short Form of the Multidimensional Perfectionism Scale (Cox et al., 2002), HMPS = Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), HMPS-SF = Short Form of the Multidimensional Perfectionism Scale (Cox et al., 2002), CAPS = Child and Adolescent Perfectionism Scale (Flett et al., 2001), APS-R = Almost Perfect Scale-Revised (Slaney et al., 2001

Thus, the primary aim of this chapter is to undertake an exploratory investigation using a convenience sample to examine the factor structure across the items of the HMPS, FMPS, and APS-R to determine the optimal structure in young adolescents. We will examine the uniqueness and similarity of the factors across the perfectionism subscales detailed in **Chapter 5** (chosen *a priori*) using exploratory and confirmatory factor-analytic techniques, comparing the traditional 2-factor model (i.e., Perfectionistic Strivings And Perfectionistic Concerns) to a 3-factor model (i.e., Perfectionistic Strivings, Perfectionistic Concerns, And High Standards). Given recent evidence suggesting bi-factor models best represent the structure of perfectionism (Howell et al., 2020; Smith & Saklofske, 2017), we will also compare the fit of two bifactor models (for a 2- and 3-factor model) to ascertain whether high standards can be classified as separate dimension from general Perfectionism. Similarities and differences of the identified factors will be examined in terms of mental health and intrinsic motivation, which have shown to be of utmost importance in young adolescents and have known associations with perfectionism (Limburg et al., 2017; Mehr & Adams, 2016; Mills & Blankstein, 2000). Given the lack of clarity on differences in perfectionism for sex (Leone & Wade, 2018), we also tested for differences in factor structure between males and females. Finally, due to the pervasive and linear increase in perfectionism in youth (Curran & Hill, 2019), we aimed to clarify a cut-off score for problematic maladaptive perfectionism.

Based on previous research that has revealed differences between perfectionistic striving subscales (Blasberg et al., 2016) and our results from **Chapter 3** and **4**, we hypothesise our findings will provide greater support for a 3 compared to 2-factor model, with a combination of the High Standards subscale from the APS-R and Personal Standards subscale from the FMPS representing a third factor of high standards. We predict that model fit will greatly improve when high standards is separated from a general dominant factor of perfectionism using bifactor modelling techniques. We also anticipate differences between

the three factors such that the High Standards factor will uniquely be associated with outcomes of well-being, whilst the Perfectionistic Concerns factor will be the most harmful.

Method

Participants

The current chapter was nested within research evaluating the effectiveness of a randomized controlled trial of a 5-lesson perfectionism intervention in schools (**Chapter 8**). A range of co-education and segregated secondary schools in Adelaide, South Australia, were contacted by e-mail and telephone, and three schools (two co-educational, one female-only) agreed for Year 8 and year 9 students to participate. The population of schools represented high socio-economic status as measured on the Index of Community Socio-Educational Advantage (ICSEA; Australian Curriculum Assessment & Reporting Authority, 2012), whereby 1000 represents the mean, with a standard deviation of 100. The schools ranked in the top 20 schools in South Australia and ranged from 1122-1173, with a mean index of 1150 (*SD* = 21.30).

Of the 298 students within the schools, 14 did not participate at baseline because they were absent from class on the day of assessment (4.70%). A further two students did not complete the perfectionism measures (0.67%). Thus, a total of 282 students were included in the baseline analyses; 116 (41.13%) were male and 166 (58.87%) were female. The mean age of students was 14.04 years (*SD* = 0.68). Assessment was repeated one month after baseline; 50 students did not participate due to absence (16%). Thus 248 students participated in the second data collection: 153 (61.7%) females and 95 (38%) males, with a mean age of 13.96 years (*SD* = 0.96).

Procedure

Approval for this study was granted by the Flinders University Social and Behavioural Sciences Ethics Committee (Project Number 7901) and the South Australian Department of Education and Child Development (Application 2018-0003). The trial is

registered with the Australian New Zealand Clinical Trials Registry (ACTRN12621000457842). Informed consent was obtained by the principals of participating schools, participating student (assent) and passive consent from their parent or guardian. Participants filled out questionnaires online on their personal laptop devices using Qualtrics Survey software. Testing was performed in a classroom setting, with students requested to comply with standard test conditions with either the author, a research assistant holding a degree in Psychology, or a teacher, available to answer any questions.

Measures

Participants completed the following measures at both time points (baseline, one month apart) detailed in **Chapter 5,** with mean item total scores used across all, and higher scores indicating higher levels of the construct in question. Measures included the Personal Standards subscale from the FMPS, the High Standards and Discrepancy subscale from the APS-R, the short-form Self-Oriented Perfectionism subscale from the HMPS, the WEMWBS, the DASS-21 (total mean score), the intrinsic motivation subscales from the AMS, and the short-form SCS.

Statistical Analyses

Across the four perfectionism subscales, an exploratory factor analysis (EFA) was conducted with the baseline data, and a confirmatory factor analysis (CFA) with one-month follow-up data. The CFA retained items from the best EFA factor solution. MPlus software version 7.31 was used to ascertain the best factor structure using weighted least squares with mean and variance adjustment (WLSMV) as recommended for use with categorical data (Brown, 2006; Muthén & Muthén, 1998-2015). The EFA used Geomin oblique rotation as factors were correlated, specifying up to 4 factors (i.e., one for each subscale). Following recommendations, items with small (≤0.4) loadings, or with substantial (>0.5) cross-loadings,

or with small differences between two or more component loadings were discarded (Costello & Osborne, 2005; Field, 2013; Guadagnoli, and Velicer, 1988).

For the factor analytic models, chi-square values are reported as per convention (e.g., Hu & Bentler, 1999). However, it is noted that these are known to be sensitive to large samples such that these are nearly always significant (Byrne, 2012). As such, the overall model of fit for each model was initially judged using the following recommended fit indices: root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and the Tucker-Lewis index (TLI). with the following *a priori* benchmarks: a marginal fit RMSEA <0.08, a good fit RMSEA < 0.05, CFI and TLI > 0.95, while an excellent fit indicated RMSEA <.01, CFI and TLI > 0.95 (Hu & Bentler, 1999; Schreiber et al., 2006). However, it has been noted that RMSEA can be artificially large in models with small degrees of freedom and sample size and are thus interpreted with some caution (Kenny & McCoach, 2003). Finally, there are various opinions about the use of modification indices to achieve partial invariance and consequent implications regarding the applicability of the Model outside of advanced statistics. Thus, a conservative approach was taken, and modification indices were not considered.

Factor invariance between males and females was also evaluated by testing three models: The Configural Invariance Model, Metric Invariance Model, and Full Invariance Model. The Configural Invariance Model estimates separate factor loadings and item threshold values (cut points between the ordinal responses) for each item between males and females. This is the “baseline” model against which the subsequent two models are compared. The Metric Invariance Model fixes the factor loadings for each item to be equivalent across males and females but allows the item thresholds to differ. The Full Invariance (i.e., Scalar) Model fixes both the factor loadings and item threshold values across males and females. If the chi-square difference value between the models is significant, it

indicates that constraining the parameters of the nested model significantly worsens the fit of the model which indicates measurement non-invariance. If the chi-square difference value is not significant and decreases in CFI are less than or equal to 0.0002 from the previous model (Meade et al., 2008), this indicates that constraining the parameters of the nested model did not significantly worsen the fit of the model, indicating measurement invariance of the parameters constrained to be equal in the nested model.

If scalar invariance is supported, the final planned step for establishing measurement invariance is to test for residual invariance, or equivalence of item residuals of metric and scalar invariant items. Residual invariance assesses whether the sum of specific variance (variance of the item that is not shared with the factor) and error variance (measurement error) is similar across groups.

All remaining analyses were conducted using the Statistical Package for Social Sciences, Version 22 (SPSS; IBM Corp., 2013). Pearson correlations were performed to evaluate the relationship between the identified factors from the CFA with psychopathology, self-compassion, well-being and academic intrinsic motivation. Simple regression analyses were conducted to evaluate the unique contribution of the perfectionism measures with regard to the aforementioned outcome variables, and binary logistic regression analyses were used to assess differences for participants classified as above or below a cut-off point on perfectionistic concerns.

Results

Preliminary Analyses

Prior to conducting main analyses, data were checked for normality to ensure all assumptions underlying statistical analysis were met. As recommended by Tabachnick and Fidell (2012), formal inference tests and visual inspection of distributions were conducted, which indicated all variables met assumptions of normality. All data were found to be

missing at random, as indicated by Little's missing completely at random test for baseline data, χ^2 (46) = 49.94, p = .319, and data at timepoint two χ^2 (105) = 101.93, p = .567.

EFA of Perfectionism Measures

Four Eigenvalues were greater than 1 (11.61, 6.12, 1.80, and 1.22). Although increasing the number of factors continued to improve goodness-of-fit, particularly with the 4-factor model showing the best model fit indices, the 4-factor solution was difficult to interpret, with one factor displaying no items with a loading greater than 0.4. In contrast, item-factor loadings for the 3-factor model showed a better conceptual fit and thus was deemed as the model of choice (**Table 6.2**).

Table 6.2

Exploratory Factor Analyses - Model Fit Comparisons

Model	RMSEA	CFI	TLI	χ^2 *	*df*	Models compared	χ^2 *	*df*
1-factor	.20	.67	.64	5074.90	434			
2-factor	.11	.90	.89	1753.97	404	1-factor against 2-factor	1303.48	30
3-factor	.07	.96	.95	955.99	375	2-factor against 3-factor	455.066	29
4-factor	.06	.98	.97	676.03	347	3-factor against 4-factor	240.999	28

Note. RMSEA = root- mean-square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index, χ^2 = robust maximum likelihood chi-square; df = degrees of freedom. * All $p < .001$.

Factor loadings for the three-factor solution are presented in **Table 6.3**. Factor 1 (Perfectionistic Concerns) comprised of items from the Discrepancy subscale of the APS-R. Factor 2 (Perfectionistic Strivings) comprised of items from the Self-Oriented Perfectionism subscale of the HMPS, and one item of the Personal Standards subscale of the FMPS ("If I do not set the highest standards for myself, I am likely to end up a second-rate person"). Factor 3 (High Standards) comprised of items from the High Standards subscale of the APS-R, and the

remaining items of the Personal Standards subscale. One item on the Discrepancy subscale ("I am seldom able to meet my own high standards of performance") had a factor loading of <.4 and was removed from the final model. Various cross-loadings were observed for items on the FMPS that loaded on both the Perfectionistic Strivings factor and High Standards factor, but as they did not reach the threshold of >.5 and had differences greater than .2, they were retained, as per statistical recommendations (Costello & Osborne, 2005; Field, 2013) and the theoretical model of Perfectionism being closely related with High Standards (Gaudreau, 2019). The resultant 31-item 3-factor model was tested in the CFA.

Table 6.3

Factor Loadings for Model of Choice

Measure and item no.	Item Description	Factor Loading		
		1	2	3
APSD_1	I often feel frustrated because I can't meet my goals	**0.609***	0.044	0.245*
APSD_2	My best just never seems to be good enough for me	**0.768***	-0.074	0.119*
APSD_3	I rarely live up to my high standards	**0.730***	0.005	-0.196*
APSD_4	Doing my best never seems to be enough	**0.878***	-0.06	0.014
APSD_5	I am never satisfied with my accomplishments	**0.815***	-0.023	-0.016
APSD_6	I often worry about not measuring up to my own expectations	**0.725***	0.001	0.302*
APSD_7	My performance rarely measures up to my standards	**0.835***	-0.078	-0.116*
APSD_8	I am not satisfied even when I know I have done my best	**0.702***	0.147*	0.007
APSD_9	I am seldom able to meet my own high standards of performance	0.309*	0.150*	0.176*
APSD_10	I am hardly ever satisfied with my performance	**0.864***	0.037	-0.142*
APSD_11	I hardly ever feel that what I've done is good enough	**0.834***	0.072	-0.127*
APSD_12	I often feel disappointment after completing a task because I know I could have done better.	**0.670***	0.059	0.138*
FMPS_1	If I do not set the highest standards for myself, I am likely to end up a second-rate person	0.262*	**0.487***	0.016
FMPS_2	It is important to me that I am thoroughly competent in everything I do	0.003	0.159*	**0.637***
FMPS_3	I set higher goals than most people	-0.046	0.315*	**0.646***
FMPS_4	I am very good at focusing my efforts on attaining a goal	-0.106*	0.257*	**0.475***
FMPS_5	I have extremely high goals	-0.003	0.323*	**0.687***
FMPS_6	Other people seem to accept lower standards than I do	0.041	0.232*	**0.546***
FMPS_7	I expect higher performance in my daily tasks than most people	-0.011	0.351*	**0.617***
HMPS_1	I must work to my full potential at all times	0.166*	**0.533***	0.227*
HMPS_2	One of my goals is to be perfect in everything I do	0.158*	**0.791***	0.055
HMPS_3	I strive to be as perfect as I can be	-0.008	**0.730***	0.218*
HMPS_4	It is very important that I am perfect in everything I attempt	0.125*	**0.864***	-0.008
HMPS_5	I demand nothing less than perfection of myself	0.191*	**0.846***	-0.085*
APSHS_1	I have high standards for my performance at work or at school	-0.047	0.000	**0.769***
APSHS_2	If you don't expect much out of yourself, you will never succeed	0.170*	0.034	**0.427***
APSHS_3	I have high expectations for myself	0.210*	-0.073	**0.916***
APSHS_4	I set very high standards for myself	0.341*	-0.038	**0.836***
APSHS_5	I expect the best from myself	0.142*	0.029	**0.783***
APSHS_6	I try to do my best at everything I do	-0.142	0.047	**0.556***
APSHS_7	I have a strong need to strive for excellence	0.144*	0.082	**0.722***

*Note** Significant item loadings >.4 are highlighted in bold. **p* <.05
APSD_9 was omitted in chosen model due to low factor loadings (<.4)

CFA of Perfectionism Measures

The 3-factor model was compared to the 2-factor model commonly proposed in the literature (Model 2: Perfectionistic Strivings and Perfectionistic Concerns). As predicted, the three-factor performed better than the 2-factor model, as indicated by the CFI and TLI fit statistics (Table 6.4). However, the RMSEA fit index was poor across both models. In order to improve the fit of the model, modification indices were inspected for Model 1. Two items were subsequently removed (Discrepancy item 1 and item 6) due to strong residual correlations with a different factor to which they were loaded on. One item on the High Standards factor (High Standards item 6) was also removed due to low factor loading (<.4). A third model was tested with the aforementioned changes revealing an improved model fit (**Table 6.4**). CFI and TLI continued to indicate an excellent fit. Thus, the refined 3-factor model (Model 3) was used for remaining analyses and was deemed to best represent the structure of perfectionism (see **Table 6.5** for factor loadings).

To ascertain whether the third factor (High Standards) is distinct from general perfectionism, two bi-factor models were created and compared using the refined 3-factor model: (1) a dominant general factor of Perfectionism including all three factors (with refinements mentioned above), and (2) a dominant general factor of Perfectionism including the factors of Concerns and Strivings only (with refinements mentioned above). As anticipated, the model fit improved when High Standards was removed from the dominant general Perfectionism factor, as indicated by an improved model fit and RMSEA (**Table 6.4**). However, this improved model fit was marginal, and definitive conclusions cannot be made using exploratory analyses. However, this preliminary evidence suggests High Standards may not be best described as another dimension of perfectionism.

Table 6.4

Confirmatory Factor Analyses-Model Fit Statistics

Model	Model fit Indices		
	RMSEA (90% CI)	CFI, TLI	χ^2 (*df*)
1. 2-factor model (PC & PS)	.15 (.14, .15)	.88, .87	2704.65*(402)
2. 3-factor model (PC, PS & HS)	.12 (.11, .12)	.92, .92	1799.85*(433)
3. 3-factor model (PC, PS and HS with 3 deleted items)	.08 (.08, .09)	.97, .97	848.65*(307)
Bi-factor models			
General dominant perfectionism factor PC, PS and HS	.08 (.07, .08)	.98, .97	725.94*(280)
General dominant factor for PC and PS only	.07 (.07, .08)	.98, .97	683.34*(290)
Model of choice (3)			
Females	.09 (.08, .10)	.98, .97	649.70*(307)
Males	.08 (.07, .10)	.96, .96	513.04*(307)

Note. PC = perfectionistic concerns, PS = perfectionistic strivings, HS = high standards, CE = correlated errors, CI = confidence intervals, RMSEA = root- mean-square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index, $\chi 2$ = robust maximum likelihood chi-square; df = degrees of freedom.
*$p < .001$.

Table 6.5

Items, Standardised CFA Squared Multiple Correlations, and Factor Loadings on the final Three-Factor Perfectionism Model

Factor	Measure	Item Description	R^2	Loading
1. PC	DIS2	2. My best just never seems to be good enough for me	.25	.87
	DIS3	3. I rarely live up to my high standards	.45	.74
	DIS4	4. Doing my best never seems to be enough	.33	.82
	DIS5	5. I am never satisfied with my accomplishments	.34	.82
	DIS7	7. My performance rarely measures up to my standards	.52	.69
	DIS8	8. I am not satisfied even when I know I have done my best	.17	.91
	DIS10	10. I am hardly ever satisfied with my performance	.27	.86
	DIS11	11. I hardly ever feel that what I've done is good enough	.36	.80
	DIS12	12. I often feel disappointment after completing a task because I know I could have done better.	.38	.79
2. PS	SOP1	1. I must work to my full potential at all times	.34	.86
	SOP2	2. One of my goals is to be perfect in everything I do	.66	.91
	SOP3	3. I strive to be as perfect as I can be	.21	.87
	SOP4	4. It is very important that I am perfect in everything I attempt	.14	.85
	SOP5	5. I demand nothing less than perfection of myself	.34	.86
	PStan1	6. If I do not set the highest standards for myself, I am likely to end up a second-rate person	.42	.85
3. HStan	Pstan2	1. It is important to me that I am thoroughly competent in everything I do	.28	.71
	Pstan3	2. I set higher goals than most people	.50	.94
	Pstan4	3. I am very good at focusing my efforts on attaining a goal	.12	.65
	Pstan5	4. I have extremely high goals	.58	.91
	Pstan6	5. Other people seem to accept lower standards than I do	.18	.78
	Pstan7	6. I expect higher performance in my daily tasks than most people	.39	.87
	HS1	1. I have high standards for my performance at work or at school	.24	.82
	HS2	2. If you don't expect much out of yourself, you will never succeed	.27	.58
	HS3	3. I have high expectations for myself	.18	.89
	HS4	4. I set very high standards for myself	.24	.93
	HS5	5. I expect the best from myself	.28	.82
	HS7	7. I have a strong need to strive for excellence	.25	.76

Note. CFA = confirmatory factor analysis; PC = perfectionistic concerns; PS = perfectionistic strivings; HStan = High Standards; DIS = Discrepancy subscale from the APS-R (Slaney et al., 2001); SOP = self-oriented perfectionism subscale from the HMPS (Hewitt et al., 1991); PStan = Personal Standards subscale from the FMPS (Frost et al., 1991); HS = High Standards subscale from the APS-R (Slaney et al., 2001). Item 9 from the original Discrepancy subscale was omitted due to low factor loading (< .4) and Items 1 and 6 were omitted due to high residual correlations with the High Standards factor. Item 6 from the original High Standards subscale was omitted due to low factor loading (< .4)

Invariance

Invariance testing of the 3-factor model between sex showed the fit of the configural model to be acceptable (*RMSEA* = .084, CFI = .97, TLI = .96). Analyses revealed metric and scalar non-invariance. That is, both the factor loadings and item thresholds could not be constrained to be the same across males and females, as indicated by significant chi-square and differences in CFI >0.002 (**Table 6.6**). Thus, given the inability to constrain either loadings or thresholds between males and females, the invariance of residual errors was not tested, and all further analyses for males and females is examined separately.

Table 6.6

Invariance Testing for Model Fit Across Sex

Model	No. of parameters	Chi-square (*df*)	CFI	Models compared	Chi-square (*df*)
Configural	384	1138.60(614) *	0.964		
Metric	360	1165.70(638) *	0.953	Metric vs. Configural	42.30(24) *
Scalar	242	1295.81(756) *	0.951	Scalar vs. Metric	177.61(118) *

Note. *$p < .01$.

Descriptives and Internal Consistency

See **Table 6.7** for means and standard deviations for all variables and perfectionism measures (i.e., factor scales - the sums of items) in this subset of participants (note: this sample subset was also part of analyses conducted in **Chapter 7**). Due to growing criticism of the unrealistic assumptions of Cronbach's alpha (McNeish, 2018), internal consistency was also assessed for all variables using Coefficient H (see **Chapter 5**), which gives equal weighting to and thus detects underperforming items. Coefficient H may be interpreted similarly to Cronbach's alpha, with scores ≥ .7 as acceptable (Pallant, 2013). Acceptable to excellent internal consistency was observed across all variables. For the sums of items for

each factor, Coefficient H was for .93 Perfectionistic Concerns, .93 for Perfectionistic Strivings, and .94 for High Standards.

Table 6.7

Summary of Descriptive Statistics for CFA Sample

Variables	Time 2 (CFA; *N* = 248)			
	Males (*N* = 95)		Females (*N* = 153)	
	M	*SD*	*M*	*SD*
PC	3.38	0.15	3.73	1.58
HS	4.13	0.11	4.36	1.07
PS	3.39	0.15	3.56	1.59
SCS-SF	4.12	0.07	3.89	0.71
WEMWBS	3.62	0.09	3.48	0.78
DASS-21	0.58	0.05	0.76	0.54
AMS-INT	4.42	0.15	4.77	1.26

Note. PC = perfectionistic concerns; PS = perfectionistic strivings; HS = high standards; AMS-INT = Academic Motivation Scale – Intrinsic subscale; WEMWBS = Warwick Edinburgh Mental Well-Being Scale, SCS-SF = Self-Compassion Scale Short-Form; DASS-21 = Depression, Stress and Anxiety Scale-21.

Convergent and Divergent Validity

Table 6.8 contains Pearson correlations for males and females separately between the identified perfectionism factors, indices of psychological well-being and distress: that is, negative affect, well-being, self-compassion, and intrinsic academic motivation. For both males and females, moderate to strong positive correlations were found between all perfectionism dimensions. As expected, Perfectionistic Concerns displayed strong negative relationships with well-being and self-compassion, and a strong positive relationship with negative affect, across both males and females. However, the Concerns factor was negatively related to intrinsic motivation for females only.

In terms of Perfectionistic Strivings, negative relationships were found with self-compassion, and moderate positive correlations with negative affect, across both males and

females, but only for females did Perfectionistic Strivings display a negative relationship with well-being and positive relationship with intrinsic motivation.

As predicted, High Standards displayed a positive relationship with well-being, but for males only, and was unrelated to self-compassion and negative affect. For females, High Standards shared a small negative relationship with self-compassion, whilst being unrelated to negative affect and well-being. For both males and females, High Standards was strongly positively associated with intrinsic motivation.

Table 6.8

Pearson Correlations between Perfectionism Factors and Outcome Variables: Males (N = 95) on the bottom diagonal, females (N= 153) on the top diagonal.

Measure	1	2	3	4	5	6	7
1. PC		.32*	.56*	-.20*	-.55*	-.64*	.63*
2. HS	.26*		.63*	.41*	.09	-.31*	.12
3. PS	.44*	.52*		.21*	-.23*	-.50*	.34*
4.AMS-INT	-.04	.70*	.15		.58*	.22*	-.39*
5. WEMWBS	-.35*	.31*	-.05	.64*		.56*	-.76*
6. SCS- SF	-.58*	-.09	-.30*	.21*	.55*		-.64*
7. DASS	.56*	-.03	.25*	-.39*	-.70*	-.67*	

Note. PC = perfectionistic concerns; PS = perfectionistic strivings; AMS-INT = Academic Motivation Scale - Intrinsic subscale; WEMWBS = Warwick Edinburgh Mental Well-Being Scale, SCS-SF = Self-Compassion Scale Short-Form; DASS-21 = Depression, Stress and Anxiety Scale-21; *$p < .05$.

Multicollinearity

Given the moderate-strong positive correlations found between the perfectionism factors for males and females, the presence of multicollinearity was examined in the context

of simple regression analyses testing concurrent validity, with a range of outcomes of psychological health and academic motivators (general negative affect, well-being, self-compassion and intrinsic motivation; see **Table 6.9**). As recommended by Tabachnick and Fiddell (2012), the condition index (CI) and variance proportions (VP) were examined. Based on these recommendations, a CI > 30 and a VP > 0.50 for at least two different variables is indicative of multicollinearity. In regression analyses for males and females, there were two instances of VP > 0.50 (.89 and .51) but in both cases no CI > 30. Thus, multicollinearity is not indicated.

Concurrent Validity

As shown in **Table 6.9**, a significant amount of variance was explained by the combined perfectionism dimensions on all outcome variables including negative affect (36% for males, 40.9% for females), intrinsic academic motivation (51.8% for males, 28.6% for females), self-compassion (34.5% for males, 44.3% for females) and well-being (27.8% for males, 39.1% for females). Across both males and females, Perfectionistic Concerns was a consistent independent predictor displaying significant negative relationships with self-compassion, well-being and motivation, and a positive relationship with negative affect. High Standards uniquely predicted a positive relationship with intrinsic motivation and well-being but provided no unique contribution to self-compassion. However, a unique negative association with negative affect was found for males only. For Perfectionistic Strivings, no unique contribution was made for negative affect or well-being across both males and females. However, Perfectionistic Strivings uniquely predicted a negative relationship with intrinsic motivation for males, and a unique negative relationship with self-compassion for females.

Table 6.9

Summary of Regression Statistics with the Perfectionism Factors, With Negative Affect, Intrinsic Motivation, Self-Compassion and Well-Being as the Dependent Variables

Outcome variables	Step	Predictors	Regression Statistics							
			Males (N = 95)				Females (N = 153)			
			B	*SE*	β	*p*	*B*	*SE*	β	*p*
DASS (N = 248)	1	**PC**	**.39**	**.06**	**.57**	**<.001**	**.40**	**.05**	**.64**	**<.001**
		PS	.08	.07	.12	.260	.04	.06	.06	.508
		HS	**-.16**	**.06**	**-.24**	**.016**	-.08	.06	-.12	.141
			R^2 = .360, F(3, 91) = 17.10, p <.001				R^2 = .409, F(3, 149) = 34.36, p <.001			
Intrinsic Motivation (N = 248)	1	**PC**	**-.31**	**.14**	**-.17**	**.032**	**-.64**	**.12**	**-.43**	**<.001**
		PS	**-.40**	**.15**	**-.23**	**.010**	.24	.14	.17	.086
		HS	**1.56**	**.14**	**.86**	**<.001**	**.71**	**.14**	**.44**	**<.001**
			R^2 = .518, F(3, 91) = 42.14, p <.001				R^2 = .286, F(3, 149) = 21.26, p <.001			
Self-Compassion (N = 248)	1	**PC**	**-.47**	**.08**	**-.56**	**<.001**	**-.44**	**.06**	**-.53**	**<.001**
		PS	-.08	.09	-.11	.331	**-.14**	**.07**	**-.18**	**.049**
		HS	.083	.08	.10	.298	-.03	.07	-.03	.681
			R^2 = .345, F(3, 91) = 15.99, p <.001				R^2 = .443, F(3, 149) = 39.53, p <.001			
Well-Being (N = 248)	1	**PC**	**-.46**	**.11**	**-.42**	**<.001**	**-.54**	**.07**	**-.59**	**<.001**
		PS	-.12	.11	-.11	.316	-.12	.08	-.14	.148
		HS	**.50**	**.12**	**.48**	**<.001**	**.37**	**.08**	**.37**	**<.001**
			R^2 = .278, F(3, 91) = 13.05, p <.001				R^2 = .391, F(3, 149) = 31.88, p <.001			

Note. Significant subscales bolded. PC = Perfectionistic Concerns; PS = Perfectionistic Strivings; HS = High Standards; *SE* = standard error.

Identifying a Cut-off Score for Problematic Perfectionism

In order to locate a cut-off point for the Perfectionistic Concerns factor and identify the point of problematic perfectionism for males and females, binary logistic regression analyses were conducted for groups high and low in perfectionistic concerns, with negative affect as the independent variable included in Step 1. Groups were initially classified using a cut-off mean total score of 3.66 as recommended by Rice et al. (2011) for defining problematic perfectionism but was too inclusive in our sample (45% males, 56% females) and was non-significant when negative affect was included as a predictor. Thus, cut-offs were adjusted for males and females until significance for negative affect was reached (see supplemental materials). For males, the cut-off mean total score was 3.78, and for females, 4.1. In this sample, 40% of males and 39% of females scored above the cut-off point on perfectionistic concerns.

A series of binary logistic regressions analyses were conducted for remaining variables (self-compassion, well-being, intrinsic motivation) to assess differences between males and females classified as above or below this cut-off point on perfectionistic concerns (see **Table 6.10**) and were added in Step 1. No significant differences were found between groups on intrinsic motivation for males and females. However, significant differences were found for self-compassion for both groups in males and females, and differences were found for well-being in females only.

Table 6.10

Summary of Binary Logistic Regression Statistics with Various Predictors for Males and Females, With Problematic Perfectionism Category as the Dependent Variable.

Predictor	Males (Group 1 *N* = 57; Group 2 *N* = 38)				Females (Group 1 *N* = 94; Group 2 *N* = 59)			
	B	*SE*	Wald	*p*	*B*	*SE*	Wald	*p*
Negative Affect	1.39	0.46	9.14	<.001	2.50	0.45	30.80	<.001
Self-Compassion	-1.25	0.41	9.38	<.001	-1.68	0.33	26.24	<.001
Well-being	-0.42	0.26	2.66	.097	-1.51	0.29	27.36	<.001
Intrinsic Motivation	0.07	0.15	.19	.654	-.25	0.13	3.35	.067

Note. Group 1 = Participants below problematic perfectionism cut-off score; Group 2 = Participants above the problematic perfectionism cut-off score; *SE* = standard error

Discussion

The objective of this chapter was to examine the factor structure of perfectionism in youth and clarify the distinction between perfectionism and healthy high standards. Improvement in model fit indices supported a 3-factor model compared to a traditional 2-factor model: comprising of perfectionistic strivings, perfectionistic concerns, and a high standards factor. Model fit improved when the high standards factor was removed from a general perfectionism factor, supporting the notion that high standards may be better understood as a distinct construct from perfectionism (Blasberg et al., 2016; Gaudreau, 2019) and supports the preliminary notion found in **Chapter 3** and **Chapter 4** such that there are differences in perfectionistic strivings measures which may indicate some measures tap into a construct of healthy high standards that is related to, but distinct from perfectionism. Our

study adds value by providing support for a new pathway for research to further investigate the novel differentiation of high standards from perfectionistic strivings.

The Devil is in the Detail: Perfectionism vs. High Standards

While the adverse consequences of perfectionism for youth have been extensively researched, there is a general lack of consensus on the definition and structure of perfectionism, particularly in relation to perfectionistic strivings (Leone & Wade, 2018). This is important as the development of successful interventions can only begin with clear definitions of primary constructs and theoretical models. Thus, the primary aim of this study was to determine the optimal structure of perfectionism in young adolescents.

We anticipated a 3-factor model (Concerns, Strivings, High Standards) rather than a 2-factor (Concerns, Strivings) would be the model fit of choice when examining individually oriented subscales of perfectionism. Our findings supported this hypothesis. Items from the Discrepancy subscale loaded onto one factor representing perfectionistic concerns, consistent with previous literature (Cox et al., 2002). A distinction between High Standards and Perfectionistic Strivings was found when items from the High Standards subscale from the APS-R and Personal Standards subscale from the FMPS (with the exception of one item) loaded onto a separate from the Self Oriented Perfectionism subscale from the HMPS.

Moreover, our study sought to examine the relationships between identified factors and indicators of wellbeing and successful learning. Our findings revealed Perfectionistic Concerns was the most harmful, sharing unique harmful relationships with self-compassion, well-being, academic motivation and negative affect. This is in line with previous research pertaining to the adverse consequences of perfectionistic concerns (Limburg et al., 2017; Mehr & Adams, 2016; Madigan, 2019). The Strivings factor shared no relationship with most outcomes, with the notable exception of a negative relationship with self-compassion for females, and negative relationship for academic motivation in males. This finding contradicts

the notion of any universal ‘adaptiveness’ of perfectionistic strivings (i.e., Stoeber & Otto, 2006).

Importantly, our results found the High Standards factor shared unique positive associations with well-being and academic motivation. The High Standards factor was largely comprised of items from the High Standards subscale from the APS-R, which shares protective relationships with unhelpful outcomes of successful learning and positive relationships with self-compassion (**Chapter 3** and **Chapter 4**) compared to other measures. High standards also comprised of items from the Personal Standards subscale from the FMPS. None of the items use the word ‘perfection’ in contrast to items from the HMPS subscale. Future research should avoid the term ‘adaptive perfectionism’ as further robust evidence is collected about the structure of perfectionism and its relation to high standards.

Differences Between Boys and Girls

Epidemiological and clinical studies have generally found higher incidence and increased risk of psychopathology in females compared to males (Eaton et al., 2012; Gater et al., 1998). It is therefore conceivable that perfectionism would be higher in females compared to males, and perhaps structurally appear different. However, sex differences in the structure and incidence perfectionism, particularly in young adolescents, is yet to be fully understood (Leone & Wade, 2018). In our sample, the structure of perfectionism and high standards differed between males and females. This is inconsistent with some previous studies examining the factor structure in youth (Sironic & Reeve, 2015; Stornaes et al., 2019), but consistent with other studies that examine the factor structure of individual perfectionism measures (Parker & Stumpf, 1995). However, some studies have reported a higher incidence of perfectionistic concerns in female students (Rice et al., 2013).

Further to this, our results indicated that Perfectionistic Strivings and High Standards acted somewhat differently for adolescent males and females. Perfectionistic Concerns held

unique harmful relationships with wellbeing, motivation, negative affect and self-compassion across both sexes, consistent with literature pertaining to the harm of perfectionistic concerns in youth (Wade, 2018). With regards to High Standards, adaptive relationships were held for both sexes with well-being and intrinsic motivation, but a unique negative relationship with negative affect was found for males only. Further, Perfectionistic Strivings held a harmful relationship with self-compassion for females only, and a harmful relationship with intrinsic motivation for males only, which suggests that a striving for perfection may result in differing mental health and academic consequences for males and females. Taken together, these results inform the need to target perfectionistic concerns in youth interventions, and further research is needed to better understand the differing impact of perfectionistic strivings and high standards on males and females.

Limitations of this research

This study has several major limitations within which our results should be interpreted. First, the 3-factor model of choice did not have an optimal RMSEA fit index as per recommendations of <.05, which is consistent with previous studies examining the structure of perfectionism across different measures. This may have been due to the smaller sample size and degrees of freedom (Kenny & McCoach, 2003). While our sample size was acceptable to run the EFA on the basis of at least five observations needed for each item (Comrey & Lee, 1992), sufficient power was not achieved for the CFA. Moreover, it is well established that adequate sample size is in part determined by the nature of the data; such that stronger data (no cross-loadings, strong factor loadings) allows for a smaller sample for an accurate analysis. However, “strong data” is rare in most instances (Mulaik, 1990; Widaman, 1993), and given the EFA had high communalities and cross-loadings observed, a larger sample for this analysis was needed, which limits the presentation of conclusive recommendations, as well as any imputation of generalizability (i.e., identified cut-off score

for perfectionism) from this exploratory investigation. Future research is needed to replicate this postulated model using larger samples of adolescents to be able to come to firmer conclusions.

An additional limitation includes the reliability of eigenvalues greater than 1 to determine the number of factors that should be retained. While this is a commonly used guideline (Yeomans & Golder, 1982), other guidelines exist in order to inform number of factors (i.e., parallel analysis, minimum average partial method; Zwick & Velicer, 1986) and such guidelines may empirically yield more accurate results to identify the number of factors that ought to be extracted.

The cross-sectional nature of our study does not allow for causal conclusions about the direction of association between perfectionism and high standards on outcomes of well-being and learning. Investigating the relationship between these factors and outcomes using longitudinal designs is warranted. In a similar vein, whilst perfectionism is noted to be relatively stable construct (Rice & Aldea, 2006), the generalizability of our findings should be interpreted with caution due to the various influences on mental health during the adolescent developmental period (Sawyer et al., 2018). This sample also exclusively utilized students from a high socioeconomic background, and hence our conclusions are limited to this group.

Conclusions

In summary, this study provides the first preliminary factor-analytic evidence of the distinction between high standards and perfectionism, with perfectionistic concerns having the most harmful relationship with psychopathology and learning. In the context of several methodological limitations described above, our results found subscales traditionally used to measure perfectionistic strivings (High Standards, Personal Standards) may be better understood as distinct from perfectionism. Thus, this chapter reveals preliminary evidence

that research should move away from the label of ‘adaptive perfectionism’ and that further work is needed to better understand distinctions between the constructs of striving for perfection versus high standards. The final two chapters will now move to examining the efficacy of a perfectionism program designed to combat perfectionism while fostering a healthy striving for high standards of achievement.

Chapter 7

Pilot Study: Randomized Controlled Trial Targeting Perfectionism in Young Adolescents

Abstract

The purpose of this chapter was to pilot test a 3-lesson perfectionism module in young, gifted adolescents. The program was designed to decrease perfectionism, measured using the Discrepancy subscale of the Almost Perfect Scale – Revised (APS-R; Slaney et al., 2001), while not impacting on healthy striving for high personal standards, also measured with the APS-R. We additionally examined the impact of the module on well-being, self-compassion, academic motivation and negative affect, at both post-intervention and 3-month follow-up. Year 8 gifted students (N = 93, M_{age} = 13.59, SD = 0.40) were randomized to receive the perfectionism module (n = 46) or classes as usual (n = 47). Data were analyzed using linear mixed models with both baseline observation and age included as covariates. At post-intervention small between group effect sizes (Cohen's d) were obtained for Discrepancy (0.40: 95% confidence intervals [CI] -0.02, 0.81), self-compassion (0.36: -0.05, 0.77) and negative affect (0.20: -0.21, 0.61), favoring the intervention group, but the commensurate effect size for high standards was negligible (0.07: -0.34, 0.48). At 3-month follow-up, only self-compassion retained a small between group effect size favoring the intervention group (0.30: -0.11, 0.71). This pilot study suggests that the intervention impacts perfectionism without affecting high standards, and improves self-compassion, which has been associated with improved intrinsic motivation and well-being. Conducting a better powered study (more modules and more participants) can more definitively inform us as to whether it can assist children universally in decreasing perfectionism while fostering a healthy high standards, self-compassion, well-being, and engagement in academic motivation.

Introduction

Children high in perfectionistic concerns are at risk of experiencing psychological distress (Essau et al., 2008; Hewitt et al., 2002; Stornelli et al., 2009; Vacca et al., 2020), lower academic performance (Madigan, 2019) and unhelpful indicators of academic success (Abdollahi et al., 2016; Chang et al., 2016), including extrinsic motivation (i.e., engaging in academic activities simply to gain a good mark or social approval; Gaudreau et al., 2016). While perfectionistic strivings have been linked to greater academic success (Chang et al., 2015; Damian et al., 2017; Mofield & Peters, 2018), other studies have evidenced its harm to children's well-being (Jones et al., 2008; Magson et al., 2019; Mitchell et al., 2013). Recently, the term "excellencism" (Gaudreau, 2019) has been coined for a positive striving for high standards to distinguish it from perfectionistic strivings. Evidence also suggests the High Standards subscale from the APS-R (Slaney et al., 2001) may be more representative of measuring healthy high standards than an unhelpful rigid striving for perfection (Blasberg et al., 2016).

Given the adverse effects of perfectionism, development of effective classroom interventions has been strongly advocated (Flett & Hewitt, 2014). Previous universal preventive interventions explicitly targeting perfectionism have been conducted with promising results (Wilksch et al., 2008; Nehmy & Wade, 2015; Fairweather-Schmidt & Wade, 2015, Vekas & Wade, 2017). To date it is unknown whether these interventions differentially target perfectionism without impacting on high standards. This is of importance in gifted youth, many of whom are thought to struggle with perfectionism (Pfeiffer & Yermish, 2014), but who also have a focus on achieving high and ambitious standards. Therefore, the main aim of this chapter was to test a modified 3-lesson *Minding Young Minds* curriculum (Vekas & Wade, 2017) developed for the current research that included greater emphasis on the difference in pursuing high standards versus pursuing perfection, and given

the results detailed in **Chapter 4**, the usefulness in practising self-compassion rather than self-criticism as a way of encouraging perseverance in the face of difficulties (Gilbert, 2014). We hypothesised that, compared to a control group, the intervention would result in decreased levels of Discrepancy but not High Standards, as well as higher levels of self-compassion, well-being and intrinsic motivation, and lower levels of negative affect.

Method

Participants

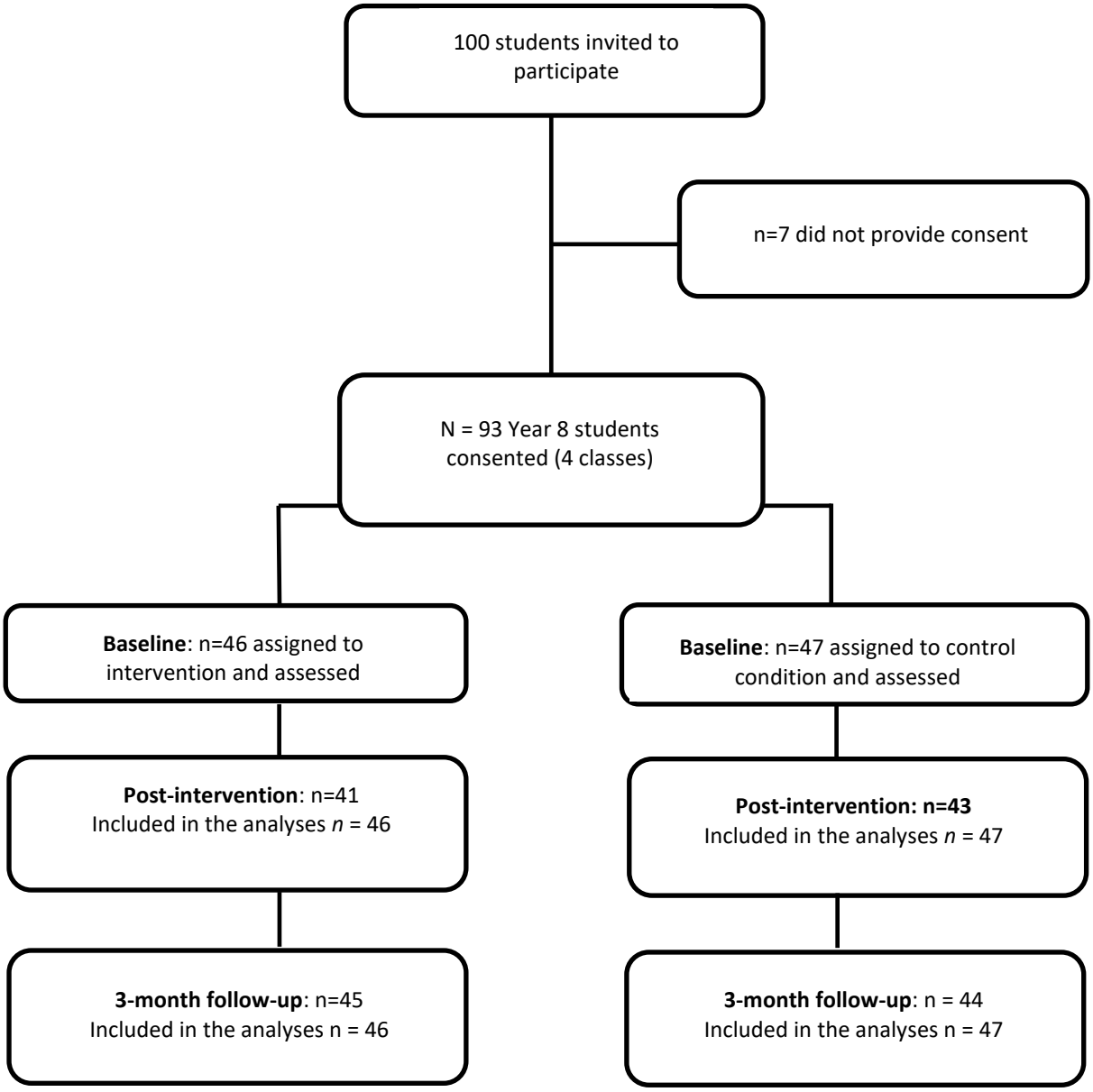
Students (N = 93; 39 female) across all four gifted classes in the Year 8 level from one government school in Adelaide (M_{age} = 13.59, SD = 0.40) participated in the research. The program for students with high intellectual potential is one of three provided in South Australia funded by the Department for Education and covers a wide catchment area and therefore is comprised of students from a range of socioeconomic backgrounds. The current pilot study was underpowered, as a previous *a priori* power analysis (Vekas & Wade, 2017) suggested that to obtain previously observed between group effect sizes of 0.30 (alpha level of 0.05, two-sided test, power level of 0.80), 103 students would be required for each group.

Design

Classes were randomized to the perfectionism lessons or wait-list control condition by the second author, using the randomization function in Excel 2016. **Figure 7.1** presents the recruitment and retention of participants in each group over the three waves of data collection (baseline, post-intervention, 3-month follow-up).

Figure 7.1

Flow of Participants in the Study



Procedure

Approval for the research was granted by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 7901) and the South Australian Department for Education and Child Development (Application 2018-0003). It is registered with the Australian New Zealand Clinical Trials Registry (ACTRN12618000444280).

Informed consent was obtained by the principal of the participating school, and from each participating student (assent) together with passive consent from their parent or guardian. All students in the intervention condition completed the program as it was included in the curriculum, but consent was obtained for the completion and use of questionnaire data in research. Students in the control condition received the intervention after the 3-month follow-up period was completed. The intervention lessons were delivered by either the first or second author, with the regular class teacher present.

Measures

Detailed information on the measures used can be found in **Chapter 5.** Collected data included the Discrepancy and High Standards subscale from the APS-R, the WEMWBS, the short form of the SCS, the intrinsic motivation subscale from the AMS, and the DASS-21. Evaluation feedback of the intervention was also collected from students and teachers.

Intervention

The program has been described previously in children aged 10-12 (Vekas & Wade, 2017), Trial ID: ACTRN12616000981426, but was slightly modified for the purposes of this study to better suit gifted and older students (see **Table 7.1**). The three lessons were each delivered a week apart. All lesson content was delivered using a cognitive behavioural therapeutic approach and in an engaging and interactive manner as opposed to a didactic presentation, as the former approach has been shown to produce larger effect sizes (Stice et al., 2007). This included use of brainstorming activities, small group and whole class discussions, out-of-class experiments, and individual-orientated reflective exercises. The programme was derived from the cognitive behavioural model of clinical perfectionism (Shafran et al., 2002) whereby a focus was had on initially presenting psychoeducation with regard to perfectionism versus the pursuit of high standards, targeting three key elements of perfectionistic behaviour in the context of school (avoidance of making mistakes,

overstudying, dismissal of successes), as well as the importance of self-compassion versus self-criticism in the face of failure. The lessons were 45 minutes in length, which was the usual lesson time. Control students were an assessment only condition and participated in their usual academic-based class lessons delivered by their teacher.

Table 7.1

Lesson Outline for 3-lessson Perfectionism Program

Theme	Outline of lesson
Unhealthy perfectionism versus the pursuit of excellence	**Class discussion:** What is the difference between perfectionism and the pursuit of excellence? **Class discussion: How does trying to be perfect feel – and what are the pitfalls?** e.g., Nobody's perfect; you can't always be the best, but you can still be proud of your achievements **JK Rowling's 10 important lessons for success (video/small-group discussion)** Failure helps you discover yourself; Take action on your ideas; You will be criticized; Remember where you started; Believe; There is always trepidation; Life is not a checklist of achievements; Persevere; Dreams can happen; We have the power to imagine better **Take home activity:** Choose one of the tips and illustrate as a poster
Three tips to be a successful learner	**Sharing of posters** **Taking time out will improve your performance** Yerkes Dodson Law – class activity to discuss the quote "the harder you study the better you perform - true or false" **Making mistakes and failing is an essential part of success** Small group discussion: What are the advantages of making mistakes **Celebrating Success is Good for You** Write down 5 things you enjoy doing – just for you **Home activity experiment** Experiment with taking time out, getting 8 hours of sleep, and incorporating 5 things you enjoy doing. Assess productivity with study

Self-Compassion versus self-criticism	**Home activity recap** How did you find changing little things in your routine? Taking time off? What happened to productivity? **How to react when things don't do as well as you had hoped or planned** Recall and discuss such a situation in small groups – what were your thoughts, feelings and behaviours? **Story: Coach Curly (critical) vs Coach Moe (encouraging)** Which coach would you choose for your friends and why? Which coach would produce a better performance? **The tripod of balance** • Threat, Achievement and Compassion • Class discussion: What happens if one is missing? **Out of class activity:** Writing a compassionate letter to a friend after a disappointment

Statistical Analyses

Missing Data and Baseline Comparisons

To identify whether there were baseline predictors of missing data at post-intervention or 3-month follow up, logistic regressions were conducted.

Repeated Measures Analyses

Linear Mixed Models (LMM) are the recommended technique for repeated-measures designs (Gueorgeieva & Krystal, 2004) as this technique accounts for correlations and statistical non-independence amongst observations and allows for an intent-to-treat analysis by using Restricted Maximum Likelihood (REML; Nich & Carroll, 1997), as it accommodates missing data. Thus, this modelling technique yields unbiased estimates of intervention effects under the assumption that data are missing at random (MAR; Han & Guo, 2014). An unstructured covariance matrix was assumed and clustering within classrooms was accounted for. All analyses adjusted for baseline observations to ensure that outcomes resulted from intervention-related influences and not measurement error or baseline

score differences, and therefore significant between group results as well as significant interactions between time and group were both of interest. This resulted in a 2 (group: intervention, waitlist control) x 2 (time: post-intervention, 3-month follow-up) repeated measures design. A priori Bonferroni corrections were applied to all LMM analyses to account for multiple comparisons. Cohen's *d* effect sizes were also calculated, where 0.2 = small, 0.5 = moderate, and 0.8 = large differences (Cohen, 1992).

Results

Missing Observations

As can be seen in **Figure 7.1**, there was very little missing data at each follow-up assessment, 10% and 4% at post-intervention and 3-month follow-up respectively. Baseline comparisons of those who had complete data across all three time points and those who did not, reported in **Table 7.2**, showed no differences between the groups. In other words, data appear to be missing at random. Moreover, there were no baseline differences between treatment groups.

Table 7.2

Investigation of Missing at Random and Any Group Differences at Baseline Using Logistic Regression

Variable	Comparing those with missing and complete data at each wave		Comparisons between groups		
	Post-intervention OR (95% CI)	3-month follow-up OR[a] (95% CI)	Control (*N* = 47) *M* (*SE*)	Intervention (*N* = 46) *M* (*SE*)	OR (95%CI)
High Standards	2.04 (0.66, 6.39)	3.50 (0.62, 32.65)	6.12 (0.14)	6.04 (0.13)	0.74 (0.42, 1.31)
Discrepancy	1.13 (0.45, 2.82)	0.24 (0.48, 1.18)	4.51 (0.21)	4.44 (0.21)	1.14 (0.73, 1.79)
Depression	0.30 (0.04, 2.59)	0.39 (0.03, 4.74)	0.81 (0.09)	0.79 (0.10)	1.92 (0.56, 6.56)
Anxiety	0.82 (0.09, 7.12)	13.50 (0.38, 48.72)	0.59 (0.08)	0.61 (0.07)	1.33 (0.44, 4.03)
Wellbeing	1.11 (0.64, 2.99)	0.10 (0.01, 3.45)	3.41 (0.10)	3.56 (0.10)	2.76 (0.75, 10.11)
Self-compassion	0.29 (0.03, 2.70)	2.19 (0.24, 19.72)	3.77 (0.11)	3.86 (0.13)	0.92 (0.46, 1.85)
Intrinsic Motivation	0.73 (0.40, 1.31)	0.85 (0.49, 1.51)	4.78 (0.18)	5.07 (0.15)	1.18 (0.91, 1.53)
Sex: Female	5.44 (0.81, 36.67)	0.39 (0.03, 5.37)	20 (43%)	19 (41%)	1.23 (0.51, 2.97)

Note. OR = odds ratio. CI = confidence intervals. [a] 3-month follow-up predicted from baseline. * = significant at $p < .001$

Repeated Measures Analyses

Table 7.3 reports estimated marginal means for main group effect, and effects of time and interaction with time and group effects, as well as effect sizes for each dependent variable where means in each model were adjusted for the respective baseline score. No main effects were found for time, between group, or interaction. For each of the variables there was no between group difference where the 95% confidence intervals did not cross zero, suggesting no between group differences. Small effect sizes were associated with three variables at post-intervention: Discrepancy, self-compassion, and depression favouring the intervention group. Discrepancy and negative affect showed an increase in the control group while both decreased in the intervention group. Self-compassion increased in both groups, but more so in the intervention group, resulting in a between group effect size difference of 0.36. There was no evidence to suggest that the lessons impacted on high standards at either post-intervention or 3-month follow-up, with between group effect sizes of 0.07 and 0.01 respectively. At 3-month follow-up, only self-compassion retained a small between-group effect size difference (see **Table 7.3**).

Program Evaluation

The feedback from students and teachers, summarised in **Table 7.4**, indicated acceptable levels of enjoyment, amount learnt and likely to use in the future.

Table 7.3

Linear Mixed Modelling Results Showing Change Over Time Between the Groups (Adjusted for Baseline Observations)

Variable	Baseline Covariate Value	End of Program		Between group effect size (95% CI)	3-month follow-up		Between group effect size (95% CI)	Main Effects and Interaction		
		Mean (SE) intervention N = 46	Mean (SE) control N = 47		Mean (SE) intervention N = 46	Mean (SE) control N = 47		Time	Condition	Time x Condition
High Standards	6.07	5.88 (0.71)	6.21 (0.71)	0.07 (-0.34, 0.48)	5.85 (0.72)	5.92 (0.72)	0.01 (-0.30, 0.42)	$F(1, 79.80) = 1.55$, $p = .217$	$F(1, 83.06) = 1.98$, $p = .163$	$F(1, 79.80) = 1.69$, $p = .197$
Discrepancy	4.46	4.22 (0.15)	4.62 (0.15)	0.40 (-0.02, 0.81)	4.54 (0.14)	4.61 (0.15)	0.07 (-0.33, 0.48)	$F(1, 85.36) = 2.05$, $p = .156$	$F(1, 87.76) = 1.97$, $p = .164$	$F(1, 85.39) = 1.42$, $p = .237$
Self-compassion	3.84	4.21 (0.10)	3.97 (0.10)	0.36 (-0.05, 0.77)	4.09 (0.11)	3.87 (0.11)	0.30 (-0.11, 0.71)	$F(1, 85.58) = 2.61$, $p = .110$	$F(1, 87.87) = 2.83$, $p = .096$	$F(1, 82.22) = 0.01$, $p = .935$
Well-being	3.47	3.55 (0.09)	3.49 (0.08)	0.11 (-0.30, 0.51)	3.50 (0.08)	3.52 (0.08)	0.04 (-0.37, 0.44)	$F(1, 85.50) = 0.02$, $p = .879$	$F(1, 90.19) = 96.53$, $p = .836$	$F(1, 85.50) = 0.34$, $p = .561$
Depression	0.81	0.74 (0.07)	0.86 (0.07)	0.25 (-0.66, 0.15)	0.70 (0.06)	0.70 (0.06)	0.00 (-0.41, 0.41)	$F(1,85.93) = 3.21$, $p = .077$	$F(1, 88.88) = 0.68$, $p = .412$	$F(1,85.93) = 0.88$, $p = .352$
Anxiety	0.60	0.56 (0.06)	0.60 (0.06)	0.10 (-0.51, 0.31)	0.52 (0.06)	0.55 (0.06)	0.07 (-0.48, 0.33)	$F(1, 84.21) = 1.23$, $p = .271$	$F(1,88.73) = 0.17$, $p = .677$	$F(1, 84.18) = 0.01$, $p = .970$
Intrinsic Motivation	4.91	4.86 (0.11)	4.83 (0.10)	0.04 (-0.36, 0.45)	4.99 (0.12)	4.92 (0.12)	0.09 (-0.32, 0.49)	$F(1, 86.53) = 1.10$, $p = .297$	$F(1, 90.15) = 0.22$, $p = .637$	$F(1, 86.54) = 0.16$, $p = .686$

Note. Higher scores indicate poorer outcomes for depression, anxiety, better outcomes for well-being, self-compassion, intrinsic motivation and greater perfectionism on all perfectionism measures.

Table 7.4

Program Evaluation

Aspect of the intervention	Students who received the intervention		Students who received the intervention after the follow-up period		Teachers' rating for the first group		Teachers' rating for the second group	
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Enjoyment/ interest	6.22 (2.00)	1-10	6.54 (2.10)	0-10	7.31 (1.70)	5-9	7.01 (1.4)	6-8
Amount learnt	5.81 (1.70)	2-9	5.91 (2.30)	0-10	7.02 (1.40)	5-8	7.00 (0.0)	7
Likely to use in the future	6.72 (2.11)	2-10	6.83 (2.01)	0-10	-	-	-	-

Discussion

This chapter represents the third evaluation of a short (two to three lesson) perfectionism intervention conducted in classroom settings. The first two interventions (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017) were conducted with children aged 10 to 12 unselected for perfectionism or other attributes, thus representing a universal prevention approach. The current research examined a pilot application of the lessons to a gifted, young adolescent cohort.

With results adjusted for baseline observations, we detected no significant between group differences but did find small between group effect sizes for Discrepancy, self-compassion and depression at the end of the intervention, retained only at follow-up for self-compassion. These small effect sizes are encouraging in the context of a small, underpowered sample size, and when examined in the context of the wider universal prevention work in

school settings to enhance mental health. Generally, evidence pertaining to the clinical effects of school-based prevention programs appear to be mixed, with meta-analytic and systematic reviews finding effectiveness of school-based intervention programs at decreasing mental health difficulties on a small scale (Johnstone et al., 2018; Nehmy & Wade, 2014; Werner-Seidler et al., 2017). For example, some universal programs for depression and anxiety have shown no significant effects (Calear et al., 2016; Sawyer et al., 2010; Sheffield et al., 2006), or small, significant effects (i.e., depression and anxiety g = .19; Werner-Seidler et al., 2017). Taken together with our findings, this suggests that further elaboration of the current intervention is justified with larger sample sizes to achieve adequate power, along with more modules to increase impact of the intervention. More evaluation of this intervention is required before we can conclude that it can be justifiably given space in the school curriculum of young adolescents.

The measure of high standards with items such as “I have high standards for my performance at work or at school”, shown across numerous studies to represent a healthy and adaptive striving, indicated that the impact of the intervention was differential, as this construct was not impacted i.e., effect sizes close to zero. This is an important finding, as people are reluctant to express self-compassion and kindness toward themselves in part for fear that their standards will drop (Gilbert et al., 2011). Evidence such as this, along with evidence showing lower levels of self-criticism to be associated with more effective goal pursuit (Powers et al., 2011), is useful for inclusion in the psycho-educational components of perfectionism interventions. In this context, the finding that self-compassion increased in the intervention group compared to control at post-intervention, and then retained a small between-group effect size (0.30) at 3-month follow-up, is a promising finding.

Limitations and Future Directions

The main limitation of this pilot study is a lack of power to determine robust and significant between group effect sizes. Getting suitable numbers of gifted students to participate in a selected trial may not be feasible, but rather gifted status could be examined as a moderator in future larger trials. It would also be of interest to additionally include a measure of perfectionistic strivings, given some debate in the field as to whether this a construct associated with unhelpful outcomes (Flett & Hewitt, 2014; Gaudreau, 2019) or helpful outcomes such as positive affect and low levels of negative affect (Damian et al., 2014). It may be that self-oriented perfectionism, shown in a meta-analysis to be associated with poorer mental health outcomes (Limburg et al., 2017), is no longer predictive of helpful outcomes when considered simultaneously with a measure of high standards, given some overlap in items measuring these different constructs. Another significant limitation lies in the study design and randomization of students at a class level, which increases the possibility of contamination effects of the intervention between students. Given the small sample size and pilot nature of this study, contamination effects were unavoidable in this instance, but should be considered when evaluating the results.

Conclusions

In summary, given the rise in perfectionism in youth (Curran & Hill, 2019), and the range of unhelpful consequences for both mental health (Limburg et al., 2017) and academic achievement (e.g., Gilman et al., 2010), the development of effective interventions for decreasing perfectionism while retaining high standards, is imperative. The current chapter suggests this is a possibility, but more research is required to show robust, replicable, long-term and widespread effects. The next chapter aimed to address the limitations of the pilot study by analyzing the effects of the intervention to a universal population of students, as well as examining the effects of the intervention on perfectionistic strivings.

Chapter 8

A Pragmatic Randomized Controlled Trial Targeting Perfectionism in Young Adolescents

Abstract

Perfectionism has adverse impacts on mental health and successful learning. The purpose of this study was to evaluate a 5-lesson perfectionism intervention in young adolescents, designed to decrease perfectionism, while not impacting on healthy striving for high standards. We also examined impact on well-being, self-compassion, academic motivation and negative affect, at post-intervention and 3-month follow-up. Australian secondary school students (N = 636, M_{age} = 13.68, SD = 0.60) were randomized to receive the intervention from their teacher (n = 343) or classes as usual (n = 293). Data were analyzed using linear mixed models adjusted for baseline observation and the effect of clustering. At post-intervention no differences were found between the groups but at 3-month follow-up, anxiety showed a significant increase in the control group with no commensurate increase in the intervention group (d = 0.23; 95% CI: 0.05, 0.40). Moderation analyses showed females in the control group to significantly decreased in well-being from post-intervention to 3-month follow-up compared to the intervention group (d = 0.33; 95% CI: 0.08, 0.58), and that those with high levels of perfectionistic concerns in the intervention significantly decreased in self-oriented perfectionism from baseline to post-intervention (d = 0.40; 95% CI: 0.25, 0.56), while those with high levels in the control group experienced significantly sustained increases in self-oriented perfectionism from baseline to 3-month follow-up. This universal intervention may be useful for the prevention of increased anxiety overall, and self-oriented perfectionism for those with problematic levels of perfectionism, but our findings suggest teacher-led programs may not be an ideal mode of dissemination.

Introduction

The harmful effects of perfectionism on youth mental health and academic performance (Mitchell et al., 2013) paired with its increasing prevalence (Curran & Hill, 2019) have resulted in a call for the development of universal school-based prevention programs for perfectionism (Flett & Hewitt, 2014). To date, universal prevention programs for perfectionism have yielded promising results (Arana et al., 2017; Fairweather-Schmidt & Wade, 2015; Nehmy & Wade, 2015; Vekas & Wade, 2017; Wilksch et al., 2008), but have all been delivered using external facilitators, and only one has focused on promoting self-compassion and high standards versus perfection (Vekas & Wade, 2017). The development of school-based programs with teachers as facilitators has been proposed as an advantageous way to disseminate programs more widely (Han & Weiss, 2005).

Thus, the main aim of the current research was to build on the results from the pilot study detailed in the previous chapter and to examine the efficacy of a modified 5-lesson intervention (Vekas & Wade, 2017) in a universal setting (i.e., not prescribed to gifted only) with young adolescents, delivered by class teachers. Our secondary outcomes of interest included well-being, negative affect, self-compassion, and academic intrinsic motivation. We hypothesised that, compared to a control group, the intervention would result in decreased levels of Discrepancy, Personal Standards, and Self-Oriented Perfectionism, but not High Standards. We also predicted that the intervention group would result in as higher levels of self-compassion, well-being, intrinsic motivation, and lower levels of negative affect (depression and anxiety) compared to the control condition. Given the propensity for samples with elevated levels of psychological distress to display greater benefits from intervention programs (Werner-Seidler et al., 2017), we also investigated whether those with higher levels of Discrepancy would have greater benefits from the intervention, as per previous recommendations for cut-off scores (Rice et al.,

2011). Further, as studies have found differences between profiles of perfectionism between males and females in latent cluster analyses (Sironic & Reeve, 2015; Stornaes et al., 2019), and measurement invariance in the structure of perfectionism measures was found between males and females in **Chapter 6**, we also investigated whether sex would moderate the benefits of the intervention.

Method

Participants

A range of co-education and single-sex secondary schools in Adelaide, South Australia, were contacted by e-mail and telephone in 2019 and 2020, and four schools (three co-educational, one female-only) agreed to the participation of Year 8 and year 9 students (N = 636; 52.8% female). These schools reflected a high socio-economic status on the Index of Community Socio-Educational Advantage (ICSEA; Australian Curriculum Assessment & Reporting Authority, 2012), whereby 1000 represents the mean, with a standard deviation of 100. The schools ranked in the top 20 schools in South Australia and ranged from 1122-1173, with a mean index of 1150 (SD = 21.30). The current study was sufficiently powered, as a previous *a priori* power analysis (Vekas & Wade, 2017) suggested that to obtain previously observed between group effect sizes (Cohen's d) of 0.30 (alpha level of 0.05, two-sided test, power level of 0.80), 103 students would be required for each group.

Design

Due to differing cohort numbers within schools, classes were randomized to the perfectionism lessons or wait-list control condition by the first author, using the randomization function in Excel 2016.

Procedure

Approval for the research was granted by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 7901) and the South Australian

Department for Education and Child Development (Application 2018-0003). The trial is registered with the Australian New Zealand Clinical Trials Registry (ACTRN12621000457842). Informed consent was obtained by the principal of the participating school, and from each participating student (assent) together with passive consent from their parent or guardian. All students in the intervention condition completed the program as it was embedded in their curriculum, but consent was obtained for the completion and use of questionnaire data in research. Students in the control condition received the intervention after the 3-month follow-up period was completed. All participants filled out questionnaires online on their personal laptop devices using Qualtrics Survey software. Testing was performed in a classroom setting, with students requested to comply with standard test conditions (i.e., working silently and independently), with either the first author, a research assistant holding a degree in Psychology, or a teacher, available to answer any questions. The intervention lessons were delivered by their regular class teacher following a 2-hour workshop delivered by the first author. Given the nature of the trial, it was not possible to blind students or teachers to the condition.

Measures

Participants completed the following measures at both time points, with mean item total scores used, where higher scores indicating higher levels of the construct in question.

Current Intervention

Based on the promising results of the pilot study, the 3-lesson program was modified to a 5-lesson program to boost the observed encouraging findings by increasing the module on self-compassion and self-criticism (i.e., adding additional flexible thinking exercises via role-play, writing self-compassionate letter to self, benefits and costs of self-criticism vs. self-compassion) and to include a social media component, particularly given the success of

increasing media literacy and awareness in other programs for various psychopathology (Wilksch & Wade, 2009; see **Table 8.1**).

In contrast to the pilot, teachers delivered the 5-lesson intervention via a structured protocol and were required to complete a checklist to ensure uniformity in lesson delivery. Compliance rate was 100%. All lessons were each delivered a week apart. All lesson content was delivered in an engaging and interactive manner as opposed to a didactic presentation, as the former approach has been shown to produce larger effect sizes (Stice et al., 2007). This included use of brainstorming activities, small group and whole class discussions, out-of-class experiments, and individual-orientated reflective exercises. The lessons were 45 minutes in length which was the usual lesson time. Control students were an assessment only condition and participated in their usual class lessons.

Statistical Analyses

Missing Data and Baseline comparisons

To identify whether there were baseline predictors of missing data at post-intervention or 3-month follow up, logistic regressions were conducted.

Repeated Measures Analyses

Linear Mixed Models (LMM) accounts for correlations and non-independence amongst observations and allows for an intent-to-treat analysis as it accommodates missing data by using Restricted Maximum Likelihood (REML). It yields unbiased estimates of intervention effects under the assumption that data are missing at random (MAR; Han & Guo, 2014). An unstructured covariance matrix was assumed, and models were adjusted for the effect of clustering, given that different teachers delivered the perfectionism classes. All analyses adjusted for baseline observations to ensure that outcomes resulted from intervention-related influences and not measurement error or baseline score differences, and therefore significant between group results as well as significant interactions between time

and group were both of interest. This resulted in a 2 (group: intervention, waitlist control) x 2 (time: post-intervention, 3-month follow-up) repeated measures design. A priori Bonferroni corrections were applied to all LMM analyses to account for multiple comparisons. Cohen's *d* effect sizes were also calculated, where 0.2 = small; 0.5 = moderate, and 0.8 = large differences (Cohen, 1992). All models were also examined for interactions with the following variables: sex and problematic perfectionism (e.g., Discrepancy) level as defined by Rice and colleagues (mean item total score of ≥ 3.5, 2011).

Table 8.1

Lesson Outline for the 5-lesson Perfectionism Programme

Theme	Outline of lesson
1. Unhealthy perfectionism versus the pursuit of excellence	**Class discussion:** What is the difference between perfectionism and the pursuit of excellence? **Class discussion: How does trying to be perfect feel – and what are the pitfalls?** e.g., Nobody's perfect; you can't always be the best, but you can still be proud of your achievements **JK Rowling's 10 important lessons for success (video/small-group discussion)** Failure helps you discover yourself; Take action on your ideas; You will be criticized; Remember where you started; Believe; There is always trepidation; Life is not a checklist of achievements; Persevere; Dreams can happen; We have the power to imagine better **Take home activity:** Choose one of the tips and illustrate as a poster
2. Three tips to be a successful learner	**Sharing of posters** **Taking time out will improve your performance** Yerkes Dodson Law – class activity to discuss the quote "the harder you study the better you perform - true or false" **Making mistakes and failing is an essential part of success** Small group discussion: What are the advantages of making mistakes **Celebrating Success is Good for You** Write down 5 things you enjoy doing – just for you **Home activity experiment:** Experiment with taking time out, getting 8 hours of sleep, and incorporating 5 things you enjoy doing. Assess productivity with study
3. The power of self-compassion	**Home activity recap** How did you find changing little things in your routine? Taking time off? What happened to productivity?

	How to react when things don't do as well as you had hoped or planned Recall and discuss such a situation in small groups – what were your thoughts, feelings and behaviours? **Class discussion: What is self-compassion? What does it look like? (thoughts/feelings/behaviours)** e.g., being kind to yourself in the face of failure, getting 'back on the horse', allowing yourself room to accept mistakes **The power of self-compassion (video/small-group discussion)** **In class activity:** Writing a compassionate letter to a friend after a disappointment **Take home activity:** Writing a compassionate letter to self after a disappointment and rate mood before and after
4. Self-Compassion versus self-criticism	**Home activity recap** How did you find writing a compassionate letter to yourself? What happened to your mood and willingness to try again? **Story: Coach Curly (critical) vs Coach Moe (encouraging)** Which coach would you choose for your friends and why? Which coach would produce a better performance? **The tripod of balance** • Threat, Achievement and Compassion • Class discussion: What happens if one is missing? **Class activity: Role Play of Mr. Compassionate versus Mr Critical** Practising the generation of self-compassionate thoughts in response to self-critical comments after a scenario of failure. **Small group brainstorm: what are some things we can do when we feel critical of ourselves?** e.g., Keep a self-compassion journal, write yourself a letter (last week's activity), Go for a walk or talk to a friend/family member **Take home activity:** CBT self-compassionate thought log
5. Social Media and Perfection	**Report back on home activity** What did people find? Were they able to generate self-compassionate alternative thoughts? What happened to mood? **Small group activity: what influence do you think social media has on trying to be perfect?** Living up to impossible standards, everybody posts their perfect selves on social media – feelings of sadness, frustration when not living the "perfect" live compared to others, pressure to get likes and comments on photos to look popular **Video: Social Media and Perfection (in class discussion)**

	What are the main messages of the video? Does your real life differ from your online life? How is it different? Why? How can this 'perfect ideal' on social media be problematic? **Small Group Activity: Reflection on program** What did you find most helpful and why? **Take home activity:** take a photo of something 'real' that happened to you during the week (i.e., something you would never post online on social media) and place on social media template to hang in class as a reminder that life isn't perfect

Results

Preliminary Analyses

Prior to conducting main analyses, the data were checked for normality to ensure all assumptions underlying statistical analysis were met. As recommended by Tabachnick and Fidell (2012), formal inference tests and visual inspection of distributions were conducted, which indicated all variables met assumptions of normality.

Participant Retention and Baseline Comparisons

Figure 8.1 presents the recruitment and retention of participants in each group over the three waves of data collection (baseline, post-intervention, 3-month follow-up). There were missing data at each follow-up assessment, 15% and 24% at post-intervention and 3-month follow-up respectively. Baseline comparisons of those who had complete data across all three time points and those who did not, reported in **Table 8.1**, showed no differences between the groups. In other words, data appear to be missing at random. There were no significant differences between treatment groups at baseline assessment (**Table 8.2**) with respect to sex, age, or baseline outcome variables. There were no significant differences between schools who participated during COVID-19 and those who did not, except for sex. This difference was likely due to the recruitment of an all-girls school during the COVID period.

Figure 8.1

Flow of Participants Through the Intervention.

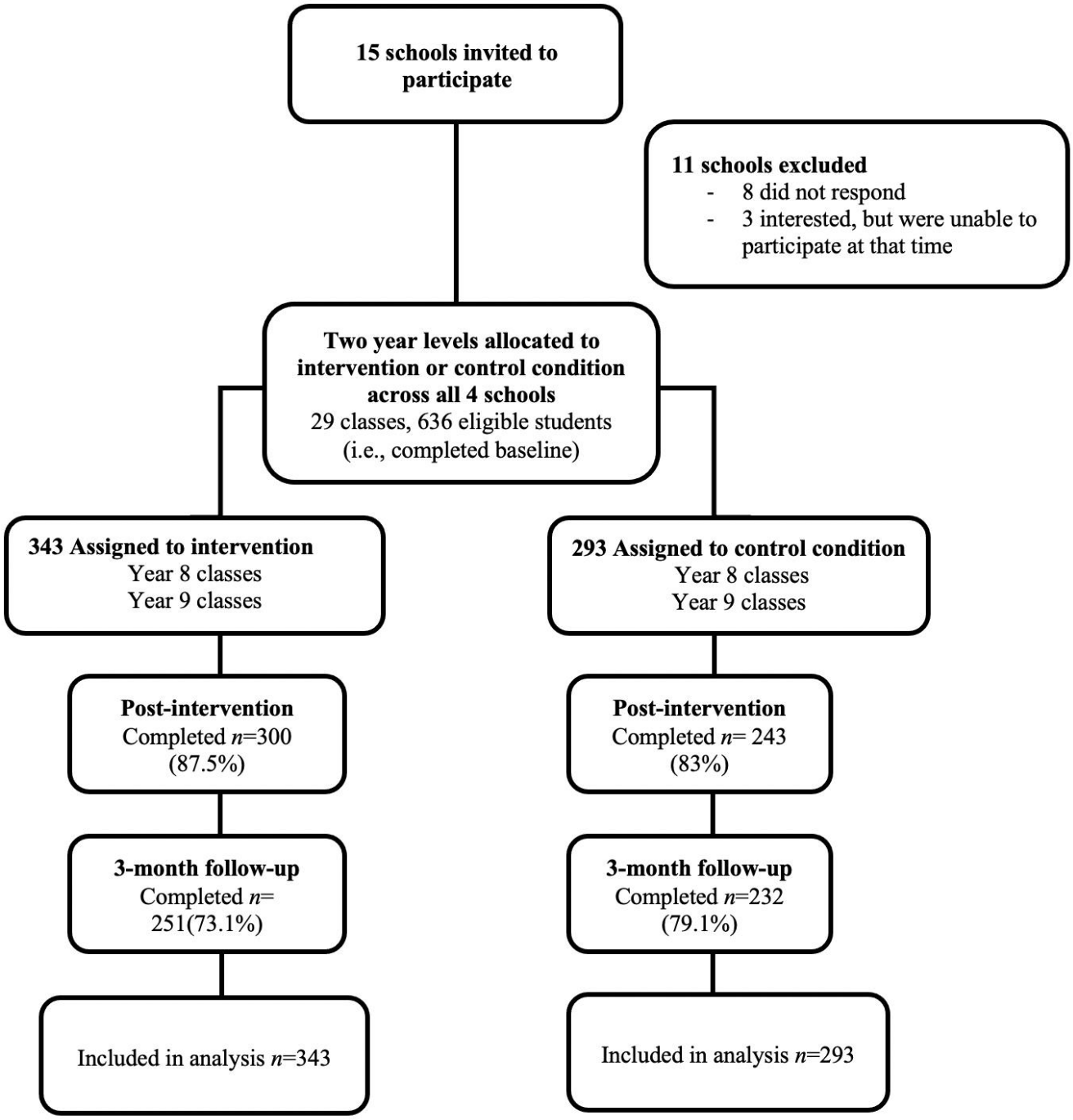


Table 8.2

Investigation of Missing at Random and Any Group Differences at Baseline Using Logistic Regression

Variable	Comparing those with missing and complete data at each wave		Comparisons between groups					
	Post-intervention OR (95%CI)	3-month follow-up OR[a] (95% CI)	Control (*N* = 293) (*M*, *SE*)	Intervention (*N* = 343) (*M*, *SE*)	OR (95%CI)	COVID (*N* = 189) (*M*, *SE*)	Non-COVID (*N* = 447) (*M*, *SE*)	OR (95% CI)
High Standards	0.95 (0.53, 1.70)	1.08 (0.67, 1.76)	5.54 (.06)	5.29 (0.06)	1.15 (0.82, 1.63)	5.45 (0.09)	5.39 (0.05)	1.09 (0.62, 1.92)
Discrepancy	0.91 (0.56, 1.48)	1.26 (0.82, 1.93)	3.91 (0.08)	3.89 (0.07)	0.95 (0.72, 1.26)	3.85 (0.10)	3.93 (0.06)	0.85 (0.54, 1.36)
Personal Standards	1.28 (0.51, 2.34)	0.76 (0.35, 1.66)	3.10 (0.05)	2.98 (0.05)	1.10 (0.65, 1.86)	3.34 (0.06)	2.88 (0.04)	0.94 (0.43, 2.03)
Self-Oriented Perfectionism	0.82 (0.52, 1.28)	1.09 (0.75, 1.57)	3.72 (0.14)	3.79 (0.13)	0.90 (0.70, 1.15)	3.85 (0.11)	3.58 (0.16)	1.28 (0.91, 1.81)
Depression	1.28 (0.12, 14.21)	0.32 (0.10, 1.00)	0.61 (0.03)	0.64 (0.03)	0.98 (0.43, 2.24)	0.68 (0.05)	0.60 (0.02)	1.39 (0.39, 4.95)
Anxiety	8.85 (0.81, 96.89)	0.41 (0.13, 1.33)	0.61 (0.03)	0.63 (0.03)	0.81 (0.37, 1.80)	0.70 (0.04)	0.58 (0.03)	1.38 (0.40, 4.83)
Wellbeing	1.06 (0.45, 5.26)	0.59 (0.59, 2.93)	3.58 (0.04)	3.57 (0.04)	0.83 (0.46, 1.50)	3.52 (0.06)	3.60 (0.03)	1.83 (0.74, 1.53)
Self-compassion	0.31 (0.10, 0.96)	0.75 (0.31, 1.83)	3.97 (0.04)	3.98 (0.03)	0.95 (0.52, 1.71)	3.90 (0.05)	4.00 (0.03)	0.77 (0.29, 2.04)
Intrinsic Motivation	0.93 (0.54, 1.58)	0.80 (0.50, 1.29)	4.90 (0.07)	4.67 (0.07)	1.14 (0.83, 1.58)	4.67 (0.10)	4.83 (0.06)	1.02 (0.61, 1.69)
Sex: female	0.47 (0.18, 1.21)	0.53 (0.23, 1.20)	147 (50%)	189 (55%)	1.02 (0.57, 1.84)	118 (63%)	218 (47%)	0.09 (0.03, 0.26)*

Note. OR = odds ratio. CI = confidence intervals. [a] 3-month follow-up predicted from baseline. * = significant at $p < .001$

Repeated Measures Analyses

Table 8.3 reports estimated marginal means for main group effect, and effects of time and interaction with time and group effects. One interaction between time and group was found for anxiety whereby small effect size changes were found, favouring the intervention group. Anxiety showed an increase in the control group while appearing stable in the intervention group, resulting in a non-significant between group effect size difference of d = 0.07 (95% CI: -0.11, .23) at post-intervention and significant between-group effect size difference of d = 0.23 (95% CI: 0.05, 0.40) at 3-month follow up, respectively.

No other between group differences found. There was no evidence to suggest that the lessons impacted on any perfectionism variable, including High Standards, Discrepancy, and Personals Standards at either post-intervention or 3-month follow-up, with between group effect sizes ranging between 0.02 and 0.18.

Main effects of time were observed for high standards, self-oriented perfectionism, well-being, depression, and intrinsic motivation whereby levels of depression significantly increased over post intervention and 3-month follow-up, while levels of high standards, well-being and motivation significantly decreased over the 3-month period.

Table 8.3

Adjusted Means and Standard Errors Across Time and Main Effects and Interactions.

Variable	Baseline Covariate	Post-intervention	3-month Follow-Up	Time	Condition	Time x Condition
	M	*M* (*SE*)	*M* (*SE*)			
Discrepancy						
Intervention	3.94	3.84 (0.06)	3.83 (0.07)	*F*(1, 449.80) = 0.01 *p* = .951	*F*(1, 23.04) = 1.67 *p* =.212	*F*(1, 449.97) = 0.06 *p* = .813
Control		3.94 (0.07)	3.95 (0.07)			
High Standards						
Intervention	5.45	5.27 (0.06)	5.14 (0.06)	***F*(1, 473.20) = 10.78 *p* = .001**	*F*(1, 26.69) = 0.58 *p* =.454	*F*(1, 473.37) = 0.22 *p* = .645
Control		5.34 (0.06)	5.18 (0.07)			
Personal Standards						
Intervention	3.06	3.13 (1.10)	3.13 (1.10)	*F*(1, 464.82) = 0.31, *p* = .576	*F*(1, 560.77) = 0.42, *p* = .517	*F*(1, 464.83) = 0.27, *p* = .608
Control		3.12 (1.10)	3.08 (1.10)			
Self-Oriented Perfectionism						
Intervention	3.77	3.58 (0.10)	3.73 (0.11)	*F*(1, 232.97) = 3.73, *p* = .051	*F*(1, 259.79) = 0.85, *p* = .359	*F*(1, 233.10) = .01, *p* = .991
Control		3.70 (0.11)	3.85 (0.12)			
Depression						
Intervention	0.63	0.64 (0.02)	0.69 (0.03)	***F*(1, 461.38) = 10.47 *p* = .001**	*F*(1, 25.60) = 0.00 *p* = .991	*F*(1, 461.34) = 1.74 *p* =.192
Control		0.60 (0.03)	0.72 (0.03)			

Anxiety						
Intervention	0.63	0.64 (0.02)	0.62 (0.02)	$F(1, 469.87) = 1.82$ $p = .283$	$F(1, 27.70) = 0.76$ $p = .394$	**$F(1, 469.79) = 5.38$ $p = .025$**
Control		0.62 (0.03)	0.69 (0.03)			
Well-being						
Intervention	3.57	3.56 (0.03)	3.53 (0.03)	**$F(1, 466.04) = 4.15$ $p = .046$**	$F(1, 27.73) = 0.11$ $p = .747$	$F(1, 465.98) = 0.79$ $p = .378$
Control		3.60 (0.03)	3.52 (0.04)			
Self-compassion						
Intervention	3.96	4.00 (0.03)	3.99 (0.03)	$F(1, 471.07) = 2.58$ $p = .119$	$F(1, 563.60) = 1.64$ $p = .201$	$F(1, 471.16) = 1.10$ $p = .292$
Control		3.98 (0.03)	3.91 (0.03)			
Intrinsic motivation						
Intervention	4.81	4.69 (0.06)	4.61 (0.07)	**$F(1, 461.63) = 4.42$ $p = .043$**	$F(1, 28.75) = 0.75)$ $p = .394$	$F(1, 461.55) = 0.10$ $p = .755$
Control		4.78 (0.07)	4.66 (0.07)			

Note. Higher scores indicate poorer outcomes for depression, anxiety, better outcomes for well-being, self-compassion, intrinsic motivation and greater perfectionism on all perfectionism measures. Significant effects are bolded.

Moderation analyses

A series of three-way interactions examining the relationship with sex and problematic perfectionism on outcome variables was conducted. Across these analyses, two significant three-way interactions were found involving sex (see **Table 8.4** and **Figure 8.2**). Post-hoc analyses indicated well-being remained stable in the intervention group for females and in the control group for males, and slightly decreased for males from post-intervention to 3-month follow-up. However, well-being substantially deteriorated for females only in the control group between post-intervention and 3-month follow-up, resulting in a between-group effect size of d = 0.33 (95% CI: 0.08, 0.58) at 3-months. Intrinsic motivation appeared stable for females in the intervention group, and for males in the control group, but decreased between post-intervention and 3-month follow-up for males in the intervention group, and females in the control group. Post-hoc analyses for intrinsic motivation revealed no significant differences between males and females in the intervention and control group at any timepoint.

Table 8.5 and **Figure 8.3** presents results for the three-way interactions involving problematic perfectionism. Post-hoc analyses indicated those in the intervention group with a problematic level of perfectionism experienced decreased levels of self-oriented perfectionism while those without a problematic level of perfectionism experienced an increased in self-oriented perfectionism levels, with a significant between-group effect size of d = 0.40 (95% CI: 0.25, 0.56) at post-intervention, with both returning to baseline levels at 3-month follow-up with no difference between the two groups. For those in the control group, students with higher levels of problematic perfectionism had a significant increase in self-oriented perfectionism at post-intervention and 3-month follow-up compared to those with lower levels of perfectionism, resulting in lower levels of self-oriented perfectionism for the latter group at post-intervention, d = 0.27 (95% CI: 0.11, 0.44) and 3-month follow-up, d =

0.36 (95% CI: 0.20, 0.53). Of most interest is the difference between those students with higher levels of problematic perfectionism. Those in the intervention group achieved a significantly lower level of self-oriented perfectionism at both post-intervention (d = 0.31, 95% CI: -.17, 0.46) and 3-month follow-up (d = 0.34, 95% CI: 0.19, 0.49) than those in the control group, indicating that the intervention is able to curtail naturally occurring growth of self-oriented perfectionism in this group.

Table 8.4

Adjusted Means and Standard Errors across Time and Interactions with Condition, Time and Sex.

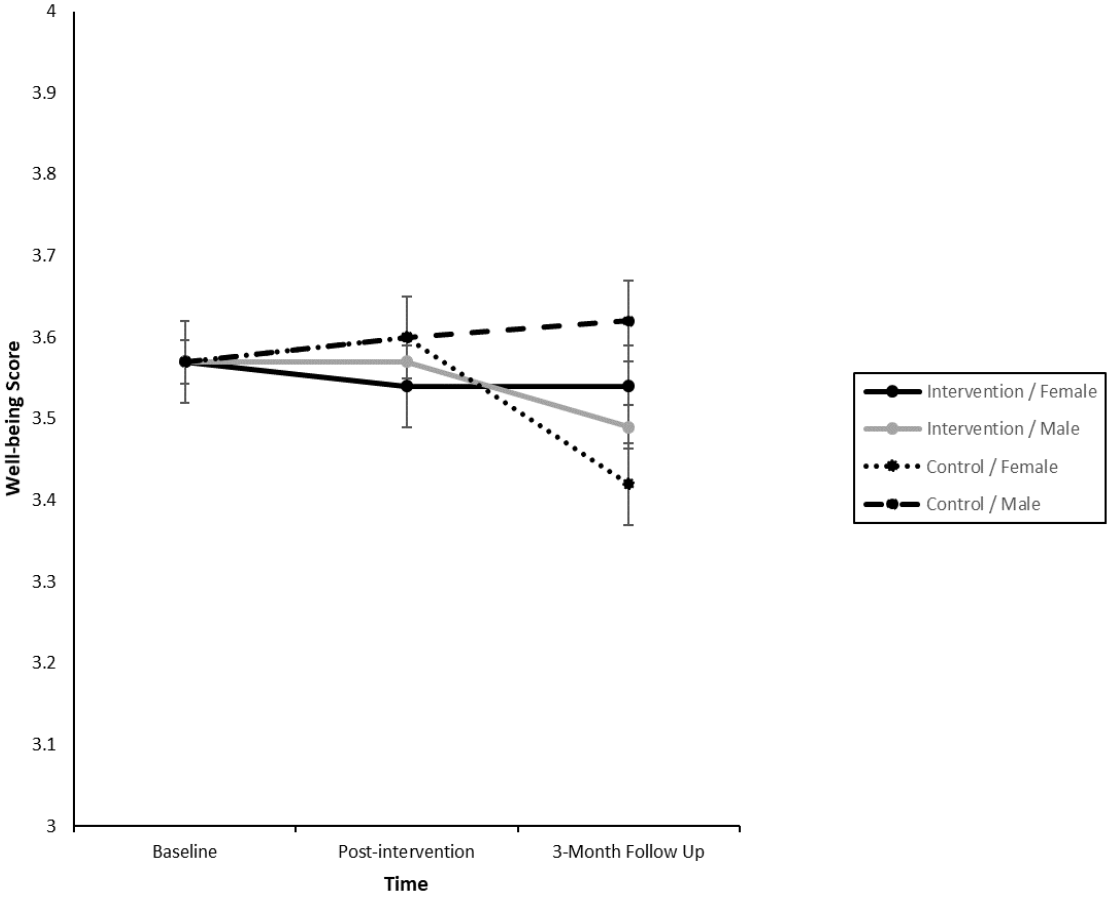
Outcome measure	Baseline covariate (*M*)	Post-intervention *M* (*SE*)	3-month follow-up *M* (*SE*)	Condition x time x sex
High Standards				
Intervention				
Male	5.45	5.20 (0.08)	4.94 (0.10)	$F(1, 474.65) = 1.82$, $p = .181$
Female		5.29 (0.07)	5.24 (0.08)	
Control				
Male		5.24 (0.09)	5.09 (0.09)	
Female		5.43 (0.08)	5.25 (0.09)	
Discrepancy				
Intervention				
Male	3.93	3.87 (0.10)	3.79 (0.11)	$F(1, 449.58) = 0.09$, $p = .762$
Female		3.80 (0.08)	3.81 (0.09)	
Control				
Male		3.89 (0.10)	3.89 (0.10)	
Female		3.96 (0.10)	3.99 (0.10)	
Personal Standards				
Intervention				
Male	3.06	3.06 (0.07)	3.00 (0.08)	$F(1, 469.42) = 0.34$, $p = .593$
Female		3.17 (0.06)	3.19 (0.07)	
Control				
Male		3.11 (0.07)	2.98 (0.08)	
Female		3.14 (0.07)	3.17 (0.07)	
Self-Oriented Perfectionism				
Intervention				
Male	3.77	3.62 (0.17)	3.73 (0.16)	$F(1, 235.01) = 0.14$, $p = .711$
Female		3.53 (0.14)	3.77 (0.16)	
Control				
Male		3.73 (0.18)	3.91 (0.20)	
Female		3.76 (0.16)	3.89 (0.17)	

Depression				
Intervention				
Male	0.63	0.63 (0.04)	0.66 (0.05)	$F(1, 458.87) = 0.00$, $p = .923$
Female		0.65 (0.04)	0.70 (0.04)	
Control				
Male		0.57 (0.04)	0.66 (0.05)	
Female		0.63 (0.04)	0.76 (0.05)	
Anxiety				
Intervention				
Male	0.63	0.61 (0.04)	0.63 (0.05)	$F(1, 467.52) = 0.98$, $p = .322$
Female		0.64 (0.03)	0.60 (0.04)	
Control				
Male		0.61 (0.04)	0.67 (0.04)	
Female		0.61 (0.04)	0.70 (0.04)	
Self-Compassion				
Intervention				
Male	3.96	4.04 (0.04)	4.00 (0.05)	$F(1, 468.61) = 1.11$, $p = .294$
Female		3.98 (0.04)	4.00 (0.04)	
Control				
Male		4.02 (0.05)	3.97 (0.05)	
Female		3.95 (0.04)	3.88 (0.04)	
Well-being				
Intervention				
Male	3.57	3.57 (0.05)	3.49 (0.06)	**$F(1,467.18) = 5.74$, $p = .021$**
Female		3.54 (0.04)	3.54 (0.06)	
Control				
Male		3.60 (0.05)	3.62 (0.06)	
Female		3.60 (0.05)	3.42 (0.05)	
Intrinsic Motivation				
Intervention				
Male	4.81	4.79 (0.09)	4.58 (0.11)	**$F(1, 462.35) = 4.48$, $p = .041$**
Female		4.62 (0.08)	4.60 (0.09)	
Control				
Male		4.75 (0.09)	4.75 (0.10)	
Female		4.81 (0.09)	4.59 (0.10)	

Note. Higher scores indicate poorer outcomes for depression, anxiety, better outcomes for well-being, self-compassion, intrinsic motivation and greater perfectionism. Significant effects are bolded.

Figure 8.2

Changes to Well-Being Across Time by Group (Intervention, Control) x Sex (Male, Female)



Note. Analysis was adjusted for baseline observations to ensure that outcomes resulted from intervention-related influences and not measurement error or baseline score differences. The covariate value for well-being was 3.57.

Table 8.5

Adjusted Means and Standard Errors Across Time and Interactions with Condition, Time and Problematic Perfectionism Level (High, Low).

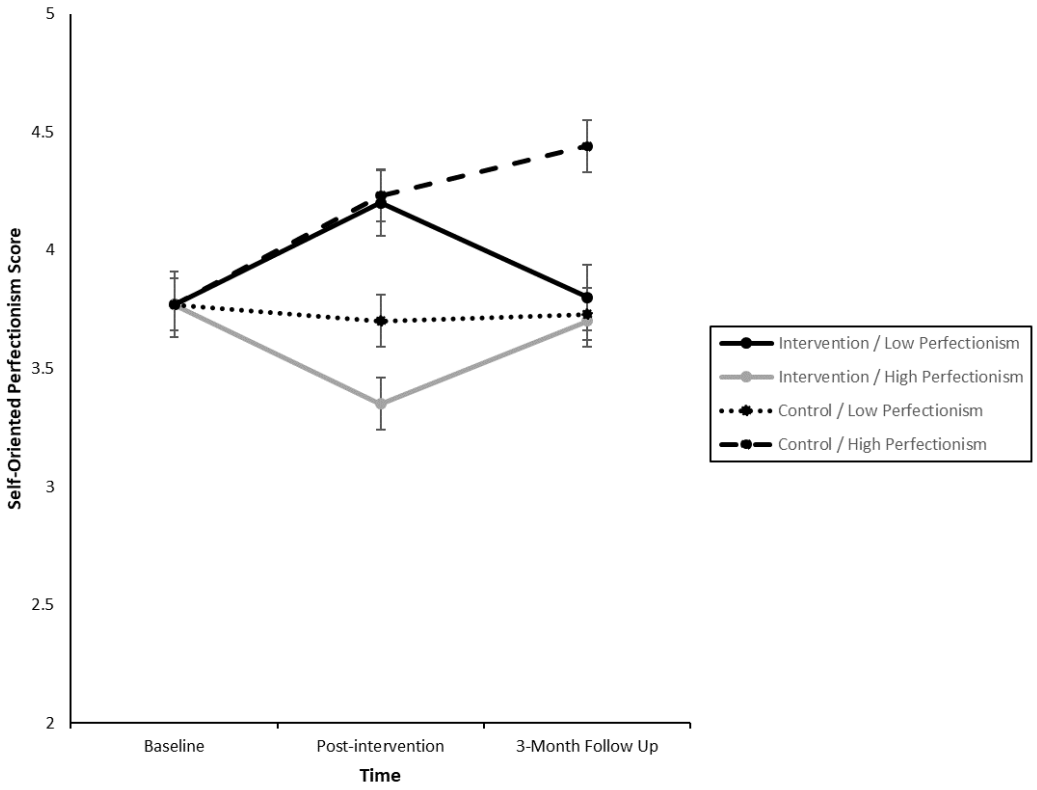
Outcome measure	Baseline covariate (*M*)	Post-intervention *M* (*SE*)	3-month follow-up *M* (*SE*)	Condition x time x perfectionism level
High Standards				
Intervention				
Low	5.45	5.16 (0.09)	5.06 (0.10)	*F*(1,477.93) = 0.01, *p* = .932
High		5.31 (0.07)	5.17 (0.08)	
Control				
Low		5.35 (0.09)	5.22 (0.10)	
High		5.34 (0.08)	5.14 (0.09)	
Discrepancy				
Intervention				
Low	3.93	3.68 (0.10)	3.92 (0.09)	*F*(1, 453.13) = 1.48, *p* = .233
High		3.94 (0.10)	3.76 (0.12)	
Control				
Low		3.88 (0.10)	3.99 (0.12)	
High		3.98 (0.10)	3.92 (0.10)	
Personal Standards				
Intervention				
Low	3.06	3.07 (0.05)	3.10 (0.06)	*F*(1, 591.16) = 0.01, *p* = .941
High		3.33 (0.08)	3.25 (0.10)	
Control				
Low		3.03 (0.06)	3.00 (0.07)	
High		3.37 (0.09)	3.23 (0.09)	
Self-Oriented Perfectionism				
Intervention				
Low	3.77	4.20 (0.11)	3.88 (0.11)	***F*(1, 295.33) = 4.24, *p* = .041**
High		3.35 (0.12)	3.70 (0.12)	
Control				
Low		3.70 (0.12)	3.73 (0.12)	
High		4.23 (0.12)	4.44 (0.12)	

Depression				
Intervention				
Low	0.63	0.59 (0.04)	0.55 (0.04)	*F*(1, 462.37) = 1.68, *p* = .201
High		0.67 (0.04)	0.80 (0.04)	
Control				
Low		0.53 (0.04)	0.62 (0.05)	
High		0.67 (0.04)	0.81 (0.05)	
Anxiety				
Intervention				
Low	0.63	0.56 (0.04)	0.45 (0.04)	*F*(1, 473.38) = 1.38, *p* = .243
High		0.71 (0.04)	0.73 (0.04)	
Control				
Low		0.51 (0.04)	0.59 (0.04)	
High		0.71 (0.04)	0.79 (0.04)	
Self-Compassion				
Intervention				
Low	3.96	4.05 (0.04)	4.05 (0.04)	*F*(1, 469.56) =0.00 , *p* = .952
High		3.96 (0.04)	3.94 (0.04)	
Control				
Low		4.02 (0.04)	3.97 (0.04)	
High		3.94 (0.04)	3.87 (0.04)	
Well-being				
Intervention				
Low	3.57	3.59 (0.05)	3.64 (0.05)	*F*(1, 469.60) = .69, *p* = .413
High		5.53 (0.04)	3.43 (0.05)	
Control				
Low		3.68 (0.05)	3.63 (0.05)	
High		3.52 (0.05)	3.41 (0.05)	
Intrinsic Motivation				
Intervention				
Low	4.81	4.69 (0.08)	4.73 (0.10)	*F*(1, 465.80) = 2.32, *p* = .135
High		4.69 (0.08)	4.50 (0.09)	
Control				
Low		4.89 (0.09)	4.75 (0.10)	
High		4.67 (0.09)	4.58 (0.10)	

Note. Higher scores indicate poorer outcomes for depression, anxiety, better outcomes for well-being, self-compassion, intrinsic motivation and greater perfectionism on all perfectionism measures. Significant effects are bolded.

Figure 8.3

Changes to Self-Oriented Perfectionism Across Time by Group (Intervention, Control) x Perfectionism Level (Low, High)



Note. Analysis was adjusted for baseline observations to ensure that outcomes resulted from intervention-related influences and not measurement error or baseline score differences. The covariate value for Self-Oriented Perfectionism was 3.77.

Discussion

The present chapter represents the fifth evaluation of a short perfectionism intervention conducted in classroom settings. The first two interventions (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017) were conducted with children aged 10 to 12 unselected for perfectionism or other attributes, and the third (Nehmy & Wade, 2015) representing a universal prevention approach, and delivered by external facilitators (postgraduate Psychology students). The current research examined application of the modified 5-lesson program to a universal, young adolescent cohort led by classroom teachers, with a focus on maintaining healthy high standards while decreasing problematic perfectionism.

Impact of Intervention on Perfectionism

The present evaluation of the program did not yield any significant decreases in either perfectionistic strivings, or perfectionistic concerns. These interventions were informed by the cognitive behavioural model of clinical perfectionism (Shafran et al., 2002) which highlights the role of the overdependence of self-evalaution on the determined pursuit and achievement of rigid and demanding perfectionsitic goals, and the resultant self-criticism that ensues when standards are not met, and the re-evalaution of standards as being insufficiently demanding if they are met. Previous randomised controlled trials demonstrated significant between group differences favouring the intervention group for self-oriented perfectionism (e.g., d = 0.47 at end of intervention and 0.40 at follow-up, Fairweather-Schmidt & Wade, 2015; d = 0.35, Vekas & Wade, 2017).

Given that interventions targeting high-risk children yield significantly better results (Stice et al., 2009), one may expect that perhaps those with higher levels of perfectionism may have benefited from the intervention. This was the case for one outcome: self-oriented perfectionism. It was found that those with high levels of Discrepancy (as defined by

recommendations by Rice et al., 2011) experienced significant decreases in self-oriented perfectionism compared to those classified as low in perfectionism at post-intervention, but differences were not maintained at 3-month follow-up. Concurrently, in the control condition, those experiencing problematic levels of Discrepancy significantly increased in their self-oriented perfectionism levels compared to those categorized as experiencing low levels of Discrepancy. Most importantly, was the meaningful difference within those students with higher levels of problematic perfectionism, with the intervention showing promise with curtailing a naturally occurring growth of self-oriented perfectionism in this group. These findings are encouraging with regard to the programs' ability to prevent increases in perfectionistic strivings for those with problematic levels of Discrepancy and illustrate the dire need for intervention work to prevent increases in striving for perfection to those categorized as vulnerable, particularly given the context of the harmful nature of self-oriented perfectionism on mental health (Limburg et al., 2017). Thus, the results suggest the program at present may be more beneficial in decreasing perfectionistic strivings for those experiencing higher levels of perfectionism.

Given the sex differences in the structure of perfectionism illustrated in Chapter 6, sex was investigated as a moderator when examining potential benefits of the intervention program. It was found that females who participated in the intervention group were protected from significant deteriorations in well-being compared to females in the control group, who experienced significant decreases in well-being exclusively (d = 0.33). For males, slight decreases in well-being were found in the intervention group, however, the differences appear to be due to the stark contrast in female group participation alone. In adolescence, females have generally been shown to have a greater incidence and risk of developing mental health difficulties with regard to mood, anxiety and disordered eating compared to males (Afifi, 2007; Merikangas et al., 2009; Parker & Roy, 2001), and a higher incidences and increased

risk of psychopathology in females compared to males (Eaton et al., 2012; Gater et al., 1998; Klose & Jacobi, 2004). This may explain the decrease in well-being in females that occurred in the control group exclusively in our sample over time. Our findings hence point to the benefits of the current program in protecting decreases in general well-being for females.

Impact of Intervention on Wellbeing and Academic Motivation

Importantly, the intervention was successful at follow-up in preventing the increase of anxiety over 3-month follow-up compared to the control group (d = 0.23). These are important findings in the context of the body of literature pertaining to the success of school-based intervention programs for psychological distress, which tend to report non-significant findings for adolescents in this age group and below (Calear et al., 2016; Johnstone et al., 2018; Ahlen et al., 2015). Some studies have noted significant decreases in depression and anxiety at post-intervention, but only three targeting anxiety have shown sustained effects of d=0.22–0.70 at follow-up (Neil & Christensen, 2009). Thus, in light of the current research, the prevention of anxiety elevation throughout the school year using a teacher-led program is notable, particularly in the context of the detrimental effects that anxiety has in youth well-being and education (Bittner et al., 2007; Pine et al., 1998). However, we cannot attribute the result to a decrease in perfectionism, and mechanisms by which the intervention elicited this effect should be examined in further research.

These findings were not, however, accompanied by robust changes in depression, self-compassion, well-being in boys, or academic motivation. Rather, significant effects of time were observed, indicating increases in depression and perfectionistic strivings, and decreases in well-being, high standards and academic motivation over 3 months across both groups. These findings reinforce the critical need for future research into the development of universal school-based programs for young adolescents, whom are at high risk of developing mental health difficulties in this period of their development (Sawyer et al., 2018). Vekas and

Wade (2017) found the 3-lesson intervention in a universal setting with a younger cohort did result in significantly higher levels of well-being (d=0.33) at three-month follow-up, and that decreases in perfectionism mediated the relationship between condition and improved well-being. In addition, our psychologist-led pilot intervention found self-compassion increased in the intervention group compared to control at post-intervention while maintaining high standards, and then retained a small between-group effect size (0.30) at 3-month follow-up. Given we were unable to replicate these results in the teacher-led program, this does pose the question of whether teachers or external facilitators are best placed to conduct such interventions, calling for a direct comparison to be conducted. In the area of eating disorder prevention, the impact of the facilitator has been supported in a meta-analysis (Stice et al., 2019), with higher impact obtained from clinicians versus researchers, when using at least two facilitators, and when facilitators received more training and supervision. Taken together, this suggests further elaboration of the intervention is justified, in terms of length, content and exploring the optimal facilitator of the program.

Limitations of the Research

These results should be interpreted in the context of the limitations of this research. First, random sampling of the general population was not achieved in our sample, which limits the generalizability of the results found. Second, while fidelity of program implementation was formally assessed via a checklist and data analysis accounted for classroom membership of each participant, observations of teacher facilitation were not conducted and no feedback on the implementation of the program or training workshop was gathered. Future research of teacher-led interventions should measure knowledge of program implementation in order to inform generalizability of program dissemination. Third, while a 3-month follow-up was conducted, further follow-ups are justified for universal based prevention programs when many of the participants are ‘healthy’ (i.e., the sleeper effect for

post-intervention differences), and the impact of prevention programs may only become apparent over larger bodies of time when the intervention group are protected from psychopathology (Nehmy & Wade, 2015; Possel et al., 2004). It may be that the relatively small timeframe of follow-up reduced intervention effects, and future research should examine longer-term effects (i.e., Spence et al., 2005). Finally, while all measures of perfectionism are validated for use in adolescent populations, a child and adolescent version of the HMPS, the CAPS (Flett et al., 2016) may be more appropriate for future research due to the item wording designed with youth in mind.

Conclusions

In summary, given the rise in perfectionism in youth (Curran & Hill, 2019), and the range of unhelpful consequences for both mental health (Limburg et al., 2017) and academic achievement (e.g., Gilman et al., 2010), the development of effective interventions for decreasing perfectionism while retaining high standards, is imperative. The current study suggests promising findings concerning the current intervention in preventing elevated levels of anxiety over time. More research is justified to show consistent effects of decreases in perfectionism, direct comparisons of differences between teacher versus psychologist led implementation, longer follow-up assessments, and larger and more diverse samples to assess widespread effects and efficacy of this promising program.

Chapter 9

Summary, Synthesis, and Integration of Overall Findings

Overview

This final chapter integrates the findings of the five studies undertaken as part of this dissertation and considers the overall contribution of the results in clarifying the differing role of perfectionism and high standards in young adolescents. A consideration of clinical and theoretical implications, as well as the emergence of broader themes derived from the findings will be provided, followed by a discussion of methodological limitations of the research, and recommendations for further avenues of research.

Summary of the Findings

As outlined in **Chapter 1**, the overall aim of this thesis was to examine if it was possible to differentiate the role of perfectionism and high standards in youth to inform future model development and thus allow better precision for developing effective prevention strategies. Three approaches were utilized to examine this distinction: meta-analytic techniques, factor-analytic techniques, and longitudinal research examining the efficacy of a school-based prevention program. As evidence suggests the wording included in the High Standards subscale from the APS-R may reflect a healthier pursuit of high standards rather than perfectionistic strivings (i.e., Blasberg et al., 2016), a key theme throughout this thesis was to uniquely examine this subscale alongside the other most commonly used perfectionistic striving subscales, namely, the Personal Standards subscale from the FMPS, and Self-Oriented Perfectionism subscale from the HMPS.

Hence, the aim of **Chapter 3** was to initially focus on examining differential relationships between commonly used perfectionistic strivings and perfectionistic concerns subscales using meta-analytic techniques. The first study of its kind, this published meta-analysis examined the differential associations between perfectionistic strivings and perfectionistic concerns subscales on academic performance and outcomes indicative of successful learning. All subscales related to perfectionistic strivings were positively related to

academic performance and helpful academic outcomes (self-efficacy, engagement, satisfaction, adjustment, hardiness, self-regulated learning strategies). However, only the High Standards subscale from the APS-R shared a unique protective relationship against unhelpful academic outcomes (test anxiety, burnout, stress, procrastination). Only Discrepancy and Doubts about Actions were negatively related to academic performance, and only Discrepancy shared a negative relationship with helpful academic outcomes. All perfectionistic concerns subscales were positively related to unhelpful academic outcomes. It was concluded that the characteristics of Discrepancy appeared to be the most maladaptive in educational settings. Moreover, despite the helpful relationships that perfectionistic strivings subscales held with academic performance and helpful academic outcomes, only High Standards shared a protective relationship against common barriers that hinder successful learning, while other perfectionistic striving subscales did not share this relationship. This finding warranted further exploration into the differences between High Standards and other perfectionistic strivings subscales.

Based on the aforementioned results, subscales measuring perfectionistic strivings and concerns were then examined in **Chapter 4** in the context of their relationship with transdiagnostic processes involved in responding to failure, hardship, and success, namely self-compassion and self-criticism, particularly since perfectionism is postulated to be detrimental in these circumstances (Shafran et al., 2002). This was to identify potential mechanisms involved in the adaptiveness of high standards versus perfection. This study was the first to examine the association between self-compassion and self-criticism on perfectionistic strivings and concerns using meta-analytic procedures, and the mediating effects of self-compassion and self-criticism on perfectionism and indicators of mental well-being were also systematically collated and reviewed. Findings indicated both perfectionistic concerns and perfectionistic strivings were positively related to self-criticism and negatively

related to self-compassion. However, only the High Standards subscale uniquely shared a positive relationship with self-compassion. In terms of the mediating effect of self-compassion and self-criticism, a lack of studies limited conclusions that could be drawn. However, lower self-compassion tended to partially mediate the relationship between Discrepancy and psychological distress in cross-sectional studies. It was thus concluded that increasing self-compassion in prevention programs may be useful in countering the harmful effects of perfectionism. Moreover, the association between perfectionistic strivings with self-criticism and self-compassion provided additional evidence to dispute the notion that such strivings are adaptive. These findings also suggest the High Standards subscale appears to differ from traditional perfectionistic strivings.

Informed by the previous two studies and preliminary evidence pertaining to the difference between the High Standards subscale and other perfectionistic strivings subscales, the third study (**Chapter 6**) adopted an exploratory (EFA) and confirmatory (CFA) factor-analytic approach in order to determine the optimal structure of perfectionism in a sample of young adolescents. The findings suggested a 3-factor model to be a better fit compared to a traditional 2-factor model: comprising of perfectionistic strivings (items from the Self-Oriented Perfectionism subscale from the HMPS), perfectionistic concerns (items from the Discrepancy subscale from the APS-R), and a high standards factor (items from the High Standards subscale from the APS-R and Personal Standards subscale from the FMPS). Factorial invariance was identified between males and females. Model fit improved when the high standards factor was removed from a general perfectionism factor in two subsequent bi-factor models, supporting the notion that high standards may be better understood as a distinct construct from perfectionism. Substantial methodological limitations (a small sample size and results not reaching optimal fit indexes as per recommendations) preclude a strong

conclusion, but results are suggestive that high standards may differ from the construct of perfectionism, and further research is needed to test this distinction.

Findings from this study also revealed that the perfectionistic concerns factor was most harmful, associated with lower self-compassion, well-being, academic motivation and higher negative affect for both males and females. Perfectionistic strivings shared no relationship with most outcomes, with the notable exception of less self-compassion for females, and less academic motivation in males. However, High standards shared unique positive associations with well-being and academic motivation. Alarmingly, our data also showed approximately 40% of young adolescents in this sample experienced perfectionistic concerns at a problematic level, with associated lower self-compassion (male and female) and well-being (females) and higher negative affect.

Finally, the fourth (**Chapter 7**) and fifth (**Chapter 8**) study turned to focusing on examining the efficacy of a school-based prevention program for perfectionism, with an emphasis on fostering high standards and self-compassion based on the results of studies 1-3, and also targeting self-criticism, the discrepant feeling between standards and performance (i.e., Discrepancy), and a fear of failure. Given the transdiagnostic nature of perfectionism (Egan et al., 2011) we also broadened the outcome factors to investigate its potential as a transdiagnostic prevention program (negative affect, general well-being, self-compassion, intrinsic academic motivation) at post-intervention, and 3-month follow-up.

The pilot study evaluated a program based on previous 2-3 lesson perfectionism interventions tested in late primary school children (Vekas & Wade, 2017), modified to suit older adolescents and applied to gifted Year 8 students. At post-intervention, small between group effect sizes (Cohen's *d*) were obtained for Discrepancy (0.40) self-compassion (0.36) and negative affect (0.20), favoring the intervention group. At 3-month follow-up, only self-compassion retained a small between group effect size favoring the intervention group (0.30).

However, all 95% confidence intervals crossed zero. It was concluded that despite non-significant results, the findings were encouraging in the context of an underpowered sample size, and further evaluation of the program was justified with regards to elaborating content on self-compassion and self-criticism, and distinguishing perfectionism from high standards.

The final study built upon results of the pilot study and evaluated a modified 5-lesson program in young adolescents universally (i.e., with no focus on gifted status). Australian secondary school students (N = 636, M_{age} =13.68) were randomized to receive the intervention from their teacher (n = 343) or classes as usual (n = 293). Despite previous studies evidencing the effectiveness of the program in a younger cohort (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017) no differences were found between the intervention and control group post-intervention with one exception. At 3-month follow-up anxiety showed an increase in the control group with no commensurate increase in the intervention group, resulting in a significant between group difference (d = 0.23). In addition, moderating effects of sex and perfectionism levels were found. Females significantly decreased in well-being in the control group from post-intervention to 3-month follow-up compared to those in the intervention group. Students with problematic levels of perfectionistic concerns in the intervention group displayed significant decreases in self-oriented perfectionism at post-intervention compared to those with low levels (d = 0.40), while those with problematic levels in the control group displayed significant increases from post-intervention to 3-month follow-up compared to other students, most notably those with problematic levels in the intervention group (d = 0.31-0.34). Thus, it was concluded that the program may be useful for the prevention of increased anxiety in young adolescents, and self-oriented perfectionism for those with problematic levels, but further research is needed to develop and evaluate in the intervention, in terms of content and length, and identify the ideal mode of dissemination (i.e., trained professionals vs. teachers).

Integration of Key Findings, and Theoretical and Clinical Implications

The Differentiation of High Standards and Perfectionism

First and foremost, this research demonstrated further research is justified into the distinction between perfectionistic strivings and high standards. This was supported through evaluating the subscales aimed to measure perfectionistic strivings on their association with academic success, self-compassion and self-criticism, and through factor-analytic techniques that demonstrated some measures used to typically assess strivings may rather be tapping into a striving for healthy high standards, versus a rigid striving for perfection. Findings in **Chapter 3** evidenced that the High Standards subscale from the APS-R shared unique protective relationships with outcomes known to hinder academic success and are maladaptively related to well-being, compared to other perfectionistic strivings subscales. Moreover, in **Chapter 4**, High Standards was the only perfectionistic strivings subscale uniquely positively related to self-compassion. These findings support previous research that has suggested that High Standards from the APS-R does not reflect the 'all or nothing' thinking and rigid pursuit of perfection, and rather reflects a healthy striving for high standards that has little to do with the core definition of perfectionism (Blasberg et al., 2016).

This research also demonstrated through factor-analytic techniques that the construct of high standards may be better understood as distinct from perfectionism. This is unsurprising, given that the High Standards factor shared unique positive associations with well-being and academic motivation, while the Perfectionistic Strivings and Perfectionistic Concerns factor were either unrelated to tested outcomes, or maladaptive in nature. Consistent with the above findings, the High Standards factor identified in **Chapter 6** was largely comprised of all items from the High Standards subscale from the APS-R. However, the High Standards factor also comprised of items from the Personal Standards subscale from the FMPS, apart from one item focused on self-criticism, which loaded on to the

Perfectionistic Strivings factor. The splitting of these items onto separate factors may explain the somewhat contradictory results found in **Chapter 3** and **Chapter 4** that preliminarily illustrated the Personal Standards subscale to be more representative of perfectionistic strivings. However, close inspection of items revealed no words from either two of these subscales use the word 'perfection' when compared to items from the HMPS subscale, which preliminarily suggests that striving for *perfection* may be a fundamentally maladaptive pursuit.

Importantly, this work contradicts the portion of literature pertaining to the 'adaptive' nature of perfectionistic strivings and discourages the label of 'adaptive' perfectionism (Hill et al., 2018; Madigan, 2019; Stoeber & Otto, 2006). When uniquely evaluated as an identified factor in **Chapter 6**, perfectionistic strivings were unrelated to well-being, as well as negative relationships with self-compassion in females, and intrinsic motivation for males. Moreover, despite sharing positive relationships with academic performance and helpful academic outcomes in **Chapter 3,** perfectionistic strivings also shared negative relationships with self-compassion (with the exception of the High Standards subscale), a known transdiagnostic protective factor for well-being (Marsh et al., 2017), and positive relationship with self-criticism, a risk factor for psychopathology (Shahar, 2015), in **Chapter 4**. These findings are consistent with research pertaining to the transdiagnostic risk both dimensions of perfectionism pose in psychopathology (Egan et al., 2011; Limburg et al., 2017), and provide preliminary evidence for the original sentiments presented in the overview chapter – while perfectionistic strivings are evidenced to be related to academic success cross-sectionally, there is a cost to one's mental health, particularly in times of stress and failure through self-criticism when standards are not met (Hewitt & Flett, 1993, 2002). Moreover, few longitudinal studies exist examining the relationship between perfectionism and successful

learning over time, which limits the conclusions that can be drawn with regards to the true adaptiveness of perfectionistic strivings.

This research also highlights the need to theoretically better understand the distinction between perfectionistic strivings and high standards. The continued lack of consensus in the literature on the complexity of perfectionism has resulted in a number of measures of perfectionism being combined in various ways, all of which are contingent upon the conceptualisation of perfectionism by the author (Leone & Wade, 2018). Findings in **Chapter 6** highlighted that grouping Personal Standards and High Standards with Self Oriented Perfectionism to measure 'perfectionistic strivings', as is commonly done within the perfectionism literature (i.e., Moroz & Dunkley, 2015; Prud'Homme et al., 2017; Stoeber & Otto, 2006), is inadvisable and may help explain the mixed findings on the outcomes of this construct. This research also suggests measuring perfectionistic strivings may be best reflected by the Self Oriented Perfectionism subscale alone and one self-critical item from the Personal Standards subscale ("If I do not set the highest standards for myself, I am likely to end up a second-rate person"), whilst High Standards, and Personal Standards to some degree, may be better understood as separate from perfectionism and reflect a construct of setting healthy high standards that foster helpful outcomes. Nevertheless, the nuances of this distinction need further investigation. We welcome future factor-analyses testing this specific hypothesis in other populations utilising other perfectionism measures as an essential avenue for future research.

Finally, throughout this thesis, findings consistently demonstrated the maladaptive nature of perfectionistic concerns on academic success and mental well-being. In particular, Discrepancy, the discrepant feeling between one's performance and set standards, appeared to share the most harmful relationship with academic success and self-criticism, suggesting that this subscale may be the most useful measure to implement in school-based settings to

reveal children and adolescents at high risk of hindering their academic success and well-being. The findings of this thesis consistent with the body of research pertaining to the harmful nature of perfectionistic concerns on psychopathology (Limburg et al., 2017; Smith et al., 2018) and academic performance (Madigan, 2019) and reiterates the need for future research to continue targeting characteristics of perfectionistic concerns, as well as perfectionistic strivings, in intervention work.

The Role of Self-Compassion and Self-Criticism in Perfectionism and High Standards: Implications for Model Development and Intervention Work

Another aim of this thesis was to better understand the mechanisms underpinning perfectionistic strivings, perfectionistic concerns, and high standards, in order to inform future model development and understand how perfectionism versus high standards are maladaptive and adaptive in nature. This research demonstrated that two important transdiagnostic processes, self-compassion and self-criticism, hold important relationships with perfectionism and high standards, and may be a key factor in differentiating striving for perfection versus high standards. Overall, both perfectionistic strivings and perfectionistic concerns shared a medium-large negative relationship with self-compassion and medium-large positive relationship with self-criticism, supporting previous findings within the literature evidencing the maladaptive nature of both perfectionism dimensions as mentioned above (MacBeth & Gumley, 2012; Zelkowitz & Cole, 2018; Limburg et al., 2017). However, the High Standards scale from the APS-R shared a unique positive relationship with self-compassion compared to other subscales of perfectionistic strivings, while also sharing a positive relationship with self-criticism. Moreover, preliminary evidence from this research evidenced the important role that self-compassion and self-criticism holds in mediating the relationship between perfectionism, high standards, and indicators of well-being. As such, it may be that High Standards reflect a healthier striving for high standards characterised by a

compassionate view of the self when standards are not met, whilst a relentless and rigid pursuit of perfection may be better reflected by other perfectionistic strivings subscales.

Indeed, our results suggest a key factor in the adaptiveness of high standards and its distinction from perfectionism evidenced by previous research (i.e., Blasberg et al., 2016, our results in **Chapter 3**) may be with whether one's failure to meet these standards is met with self-criticism, or a compassionate view of the self. Self-compassion in particular may allow individuals to engage in goal-directed behaviours in a healthy manner and curtail self-evaluations based entirely on achievement. For example, increased levels of self-compassion were a key mechanism through which High Standards exerted a helpful impact in academic settings (Fong & Cai, 2019). However, lower levels of self-compassion fully explained the harmful effects of Self-Oriented Perfectionism on subjective well-being (Stoeber et al., 2020), which supports the notion that self-compassion may address the consequences of excessively pursuing goals by fostering kindness when goals are not met (Ferrari et al., 2018).

Given no other perfectionistic strivings subscales shared a positive relationship with self-compassion, our findings appear to suggest that a rigid striving for perfection is unlikely to ever be met with self-compassion in the face of failure and should be thus discouraged. This is consistent theoretical work in the area of perfectionism: Gaudreau's (2019) postulated theory that striving for perfection is uniquely characterized by excessive pursuit of standards in a relentless manner with diminished returns due to burnout and criticism of the self, and Greenspon's (2012, 2014) work that suggest a striving for perfection can only ever be met with a fear of failure and harsh criticism when goals are inevitably not met, in comparison to striving for high standards, that may be characterized by acceptance, or in other words, compassion, when goals are not met. Moreover, Hewitt & Flett (1993) postulate those high in perfectionistic strivings are at great risk of psychological distress when exposed to stress and

failure. Indeed, evidence has shown individuals high in self-oriented perfectionism experience withdrawal from tasks following failures (Hill et al., 2011). Self-criticism has also been evidenced to be an important facet of perfectionism and settling inflexible unattainable standards of achievement (Shafran et al., 2002) and an important factor in the harmful relationship between perfectionism and psychopathology (Dunkley et al., 2006). To this end, longitudinal research and future model development is critical in this area, and these two variables may be useful to guide continuing research to further distinguish perfectionism from high standards.

Taken together, the associations found between perfectionism with self-compassion and self-criticism, and the accumulating evidence that low levels of self-compassion and high levels of self-criticism partially contribute towards the harmful effects of feeling discrepant when falling short of one's standards, suggest that perfectionists may benefit from interventions aimed at enhancing their levels of self-compassion to counter the negative effects of perfectionism. To address the consequences of excessively pursuing goals and engaging in harsh self-criticism when goals are not met, fostering self-compassion and targeting self-critical cognitions may encourage flexibility in setting standards for oneself, whilst encouraging resilience in the face of failure. Components of self-compassion approaches such as Mindful Self-Compassion or Compassion-focused therapy (Neff & Germer, 2013; Gilbert, 2009) could be useful to evaluate when treating perfectionism (i.e., James & Rimes, 2018). Future longitudinal research in this area is warranted in order to investigate whether greater emphasis on self-compassion would enhance intervention outcomes and decrease the detrimental associations of perfectionism with psychopathology.

Sex Differences in Perfectionism in Young Adolescents

Sex differences in the incidence and structure of perfectionism remain unclear (Leone & Wade, 2018; Smith et al., 2021). This research evidenced that the structure of

perfectionism differed between males and females, which is somewhat inconsistent with previous research examining the factor structure in youth (Sironic & Reeve, 2015; Stornaes et al., 2019). Moreover, the function of perfectionism differed between the sexes. Perfectionistic concerns were consistently related to harmful outcomes in our factor-analytic study, whilst perfectionistic strivings appeared maladaptive for levels of self-compassion in females, and intrinsic motivation for males. These results reiterate the need to target perfectionistic concerns in youth interventions and further illustrate the complexity of defining perfectionism in adolescents. Further research into the area of sex and the differing structure and function of perfectionism is warranted.

Intervention Work in Decreasing Perfectionism and Cultivating High Standards

Interventions for perfectionism need to be informed by conceptualisation of the construct and theoretical models of perfectionism. This research identified adolescents high in perfectionistic concerns displayed significantly lower levels of self-compassion and higher levels of negative affect. Thus, perfectionistic concerns should accordingly be prioritised in future intervention work. Moreover, given the positive relationships found between high standards and indices of well-being, future longitudinal intervention work should continue to place greater emphasis on fostering high standards whilst decreasing the pursuit of perfection, and the usefulness in practising self-compassion rather than self-criticism as a way of encouraging perseverance in the face of difficulties (Gilbert, 2014).

Our data also showed approximately 40% of young adolescents experience perfectionistic concerns at a problematic level. This is consistent with previous evidence pertaining to the concerning high levels of perfectionism in youth (Hawkins et al., 2006; Sironic & Reeve, 2015), and linear increase in perfectionism (Curran & Hill, 2019). Given that youth experiencing perfectionism are at an increased risk of psychopathology and impairments to learning (Hewitt et al., 2002; Madigan, 2019), early intervention programs are

critical. Studies testing perfectionism intervention programs in youth (i.e., Fairweather-Schmidt & Wade, 2015; Nehmy & Wade, 2015; Vekas & Wade, 2017) have yielded successful outcomes. Hence, the current intervention program was developed based on protocols for previous successful programs (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017), with an added focus on fostering high standards and cultivating self-compassion. The research demonstrated promising findings for our underpowered 3-lesson pilot study using trained professionals as facilitators of the program. Our teacher-led, boosted 5-lesson intervention, while not having an impact on perfectionism, had some encouraging findings in protecting the increase of anxiety over time (d = 0.23), and protecting the well-being of female students from significant decreases. Moreover, those with high levels of problematic perfectionism (i.e., Discrepancy) had significant decreases in self-oriented perfectionism at post-intervention (d = 0.40). Taken together, this suggests the program may be beneficial in protecting increases in anxiety universally, curtailing the growth of self-oriented perfectionism over time for those with problematic perfectionism levels, and specifically aid females. Further development of this program is encouraged, especially when comparing these findings to the somewhat mixed evidence and overall small-medium effect sizes in the realm of universal based prevention programs (Nehmy & Wade, 2015)

However, these findings raise some questions about the optimal delivery mode and number of lessons needed for perfectionism prevention in young adolescents. While promising findings and significant decreases in perfectionism were found in school children aged 10-12 with a similar protocol (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017), young adolescents are particularly vulnerable population to increased levels of psychopathology (Calkins, 2010). Previous perfectionism interventions with promising results delivered in high-school students (i.e., Nehmy & Wade, 2015) included 8 lessons

taught over 4-8 weeks. It may be that a longer and more nuanced prevention program deserves re-consideration to enhance findings.

While we cannot directly compare teacher-led versus psychologist-led results in our study, our results seem to suggest that the latter programs may be better suited in universal settings given more beneficial findings. The training of teachers is advantageous with regard to the dissemination of widespread prevention programs and ease of delivery in school curricula (Han & Weiss, 2005), and teacher-led interventions in depression and anxiety have shown small, but significant between-group effects (g = 0.12-0.13, Shelemy et al., 2020). However, there is evidence to suggest that prevention programs delivered by external facilitators such as psychologists may be more efficacious in nature compared to those delivered by teachers (Stice et al., 2009; Wahl et al., 2014), and elicit larger effect size differences (Stallard et al., 2014). To the best of our knowledge, our study was the first to examine the use of a universal school-based intervention program facilitated by teachers in the field of perfectionism, and future research should endeavor to directly compare the effectiveness of this intervention when led by trained professionals versus teachers to further investigate the optimal delivery of perfectionism interventions.

Methodological Considerations and Limitations

This research provides novel evidence that a distinction between high standards and perfectionism is warranted, as well as solidifying the maladaptive nature of perfectionistic concerns on mental health and academic success in adolescents. Moreover, our findings dispute the notion that perfectionistic strivings should be considered ‘adaptive’ and contributes to the existing literatures on perfectionism intervention work in young adolescents. However, it is important to consider the findings in the context of numerous limitations with regard to the study design and methodology.

First, the focus throughout this thesis was to examine the most common trait perfectionism subscales within measures involving individually driven perfectionism, which are considered to have the most impact on clinical psychopathology (Shafran et al., 2002; Egan et al., 2011). However, other facets of perfectionism exist that are externally driven (i.e., Parental Concerns and Parental Criticism from the FMPS), as well as additional subscales of individually driven perfectionism (i.e., Concerns over Mistakes, Doubts about Actions and Organisation from the FMPS, Order from the APS-R, Socially Prescribed Perfectionism from the HMPS) and were not considered in **Chapters 6-8** using our young adolescent sample. This limits the conclusions that can be drawn about the generalisability of our findings in clarifying the construct of perfectionism. Our *a priori* selection of subscales were informed from findings in **Chapter 3** and **4** and thus influenced our findings, such as choosing only one perfectionistic concerns subscale, Discrepancy, given it was evidenced to be the most harmful. It was beyond the scope of this thesis to examine all facets of perfectionism measures and we were mindful of respondent burden, particularly in the context of using multiple measures with a young adolescent sample. Nevertheless, our promising preliminary evidence, paired with limited published studies examining the factor structure across multiple measures of perfectionism in youth, calls for future research to use entire perfectionism instruments as they explore the validity of a high standards factor that may be distinct from perfectionistic strivings.

In a similar vein, other limitations with regards to selected measures are important to consider in the context of the results found. The HMPS is yet to be formally validated for use in children and adolescents. The decision to use this measure was based on initial observations that the HMPS was one of the most common perfectionism measures found in meta-analytic studies conducted in this thesis. However, in hindsight, it would be more appropriate for future research to also include the child and adolescent version of the HMPS,

the CAPS (Flett et al., 2016). It should be noted, however, the construct validity of perfectionism measures in children and young adolescents is generally poor (Leone & Wade, 2018), paired with a lack of consensus with respect to the definition of perfectionism, the use of various combinations of perfectionism measures throughout the literature, and contradictory findings with respect to the adaptiveness of perfectionistic strivings. This broader issue on the validity of perfectionism measures should be placed as a priority for future research to glean clarity on the way we measure perfectionism in youth. Similarly, the SCS has not been formally validated or designed for use with young adolescents in mind and given the somewhat complex language used within the SCS items (e.g., I try to see my failings as part of the human condition), it is possible the items may not have been fully understood by the current sample. A Self-compassion Scale for Youth has recently been validated for use in children and young adolescents (Neff et al., 2020), and future research should endeavour to utilise this measure when examining self-compassion in these populations.

On a pragmatic level, self-report measures are commonly used throughout research with adolescents due to their practical usefulness and ability to be widely disseminated with ease across large sample sizes. However, self-report measures come with several limitations, including the inherent risk of respondent bias in order to appear socially desirable. The use of brief semi-structured interviews, clinician-rated data, parent-rated data or teacher-rated data may be preferable to reduce the risk of respondent bias in further studies evaluating perfectionism in young adolescents.

Issues about studies having enough power was relevant across most of the research conducted, particularly when working in a universal setting (where floor effects are likely to exist) and testing moderation effects. Working in such a context can be expected to obtain small effect size changes despite using quite large samples. Small effect size *per se* are not

considered problematic in universal settings. For example, it has been concluded that interventions that prevent or delay depression may contribute to the considerable reduction of the disease burden and the associated economic costs (van Zoonen et al., 2016).

Other methodological limitations important to consider include the implementation of the perfectionism program in studies four and five, which influence the conclusions that can be drawn from the findings. Firstly, randomisation to the intervention or control condition occurred on a classroom level in each school, rather than a school level. This decision was made in the early stages of planning in order to ensure equal distribution of students into each condition given differing samples of students per school, and limited time to collect data in the event of an uneven distribution of participants. Randomisation on a school level ultimately reduces contamination effects of the intervention group between students in differing conditions. However, as randomisation occurred on a classroom level within schools, there is a possibility that students in the control group were susceptible to intervention effects, either through contact with students in the intervention group, or diffusion of the intervention with teachers sharing different classrooms, thus hindering validity of the findings (Craven et al, 2001). This may, in turn, partially explain the null results found with regards to the impact of the intervention on levels of perfectionism. Further research is needed with randomisation on a school level to examine the efficacy of the intervention.

Another limitation is the use of a wait-list control condition for the pragmatic RCT studies evaluating the perfectionism program for young adolescents. Due to logistical reasons, schools were under-resourced to provide an active comparison intervention. Thus, the use of ‘classes as usual’ control conditions were implemented. The use of active control groups is recommended when evaluating intervention programs in order to reduce expectation and placebo effects. This is an important design feature to address in future

studies when examining the efficacy of perfectionism programs in schools, however, must be balanced with the flexible needs of the school environment. Moreover, substantial efforts were made to recruit a population that encompassed diverse schools from a range of socioeconomic backgrounds in order to increase the generalisability of findings. However, it was noted schools typically comprising of students from low-income backgrounds declined to participate due to beliefs that challenges with perfectionism were not applicable to their students. Thus, all participating schools were representative of students from high SES backgrounds, which decreases the generalisability of findings.

Finally, the use of a short 3-month follow-up to assess changes from the perfectionism intervention limits the ability to draw solid conclusions on the true efficacy of the program. Indeed, main effects of time whereby all students significantly decreased in overall mental well-being throughout the year were observed, consistent with evidence adolescence being a period where students are susceptible to decreases in their mental health (Ogden & Hagen, 2018). However, it may be that significant differences between the groups become apparent over a longer period of time whereby those in the intervention group are protected after a longer period of time has passed (i.e., Nehmy & Wade, 2015; Possel et al., 2004).

Avenues for Future Research

While the findings presented in this thesis contribute to advancing the current understanding of perfectionism versus high standards, important avenues for further research are highlighted given the methodological limitations aforementioned. Ultimately, the development of successful interventions can only begin with clear definitions of primary constructs and theoretical models. As evidenced in **Chapter 2**, conceptualisations of perfectionism differ depending on the measures utilised, and there remains an ambiguity with regards to the ways in which perfectionism results in specific psychological outcomes. Our findings highlighted two important issues that deserve further clarification.

First, measures traditionally used to tap into perfectionistic strivings (e.g., High Standards subscale, Personal Standards from the FMPS) may be capturing a healthy striving for high standards unrelated to the core definition of perfectionism. Future studies should endeavour to examine the distinction of high standards and perfectionism using entire perfectionism instruments, with larger sample sizes, and examine their association with outcomes associated with mental health and well-being longitudinally, in order to better understand this relationship. Moreover, a measure has been newly developed in order to differentiate the pursuit of perfection versus excellence, the Scale of Perfectionism and Excellence (SCOPE; Gaudreau, 2019) which could also be utilised in factor analyses with more established measures of perfectionism, in order to better understand the characteristics of pursuing perfection versus high standards.

Second, response to failure, such as self-compassion and self-criticism, may play a critical role in the theoretical distinction between striving for perfection versus high standards and subsequent relationship to mental health and academic outcomes. Our findings evidenced the harmful associations that perfectionism holds with self-compassion and self-criticism, with the exception of the High Standards subscale, and the cross-sectional partial mediating role of self-compassion and self-criticism in the harmful relationships between perfectionistic strivings and concerns with outcomes associated with well-being. However, more longitudinal complex modelling is required to better understand this relationship. This work is important given the continued complexity of the construct of perfectionism (Cheek et al., 2018), its established relationship with psychopathology (Limburg et al., 2017) and steady linear increase in youth (Curran & Hill, 2019). Only two cross-sectional studies examined the effect of self-compassion as a mediator for perfectionistic strivings, with self-compassion partially mediating the negative relationship of High Standards on depression, and fully mediating the negative relationship of Self-Oriented Perfectionism on well-being,

respectively (Stoeber et al., 2020; Wei et al., 2020). Further, only one study has concluded self-criticism fully mediates the positive relationship between Personal Standards and compulsive exercise (Taranis & Meyer, 2010). To date, no longitudinal mediation has been conducted in the area of perfectionism, self-compassion and self-criticism. More complex multivariate models will be required to properly understand the effect of perfectionistic strivings versus high standards on mental health and academic outcomes. Thus, future research should investigate how baseline perfectionism and high standards influence change in mental health outcomes and academic outcomes, through its influence on self-compassion and self-criticism, in order to glean a better understanding of guide future model development, and hence, prevention and intervention work.

Despite three decades of research in the area of multidimensional perfectionism, sex differences with regard to the presentation of perfectionism and resulting consequences remain unclear (Smith et al., 2021), and recommendations have been made to investigate factorial invariance within measures with respect to sex (Leone & Wade, 2018). Our findings suggest there are differences in the structure of perfectionism between males and females in youth, and the way in which they are related to various academic and mental health outcomes. We advocate for further research to continue investigating the invariance between sexes, both in youth and in adults, in order to glean a nuanced understanding of the differing impact perfectionism has on the sexes, and how this can be translated into intervention work.

Overall, findings with respect to our intervention appear promising in the context of other mental health prevention programs, but clearly requires further evaluation and development. It may be that the students' environment in terms of peer, teacher, school and/or parent pressures around achievement cancel out the impact of the intervention, arguing for a longer, or more saturated intervention that has booster sessions included. Indeed, adolescence is a key period for the development of perfectionism, with the external

environment playing a pivotal role (Flett et al., 2002). There is a body of evidence suggesting perceived pressure from teachers significantly increases the incidence of perfectionistic concerns, while receiving perceived teacher support decreases perfectionism (Domocus & Damian, 2018). Parental Expectations of young adolescents also predict increases in socially prescribed perfectionism (Damian et al., 2013). Moreover, gifted students have been reported to perceive high levels of expectations and pressures of perfection from teachers (Speirs-Neumeister et al., 2009). Interventions from other disciplines such as sleep and physical health have reported great benefit from the inclusion of parents in an intervention (Bonnar et al., 2015; Van Lippevelde et al., 2012). Hence, it may be that parental involvement and inclusion is an important area of research to consider in future work examining the implementation of school-based programs.

While differences and prevalence of perfectionism between gifted and non-gifted students have been researched in the perfectionism literature, it appears there have been no studies implementing school-based prevention in low socio-economic (SES) schools, and the moderating effects of SES have not been investigated in perfectionism literature. One study has found students with affluent backgrounds may be at higher risk of peer envy and substance use compared to those from low-income families (Lyman & Luthar, 2014). However, Hong et al. (2016) found that parents from low SES backgrounds tend to be more intrusive towards their children with lower cognitive ability, which was related to higher incidents of Self-Oriented Perfectionism. It is known that SES is a significant risk factor for mental health (Reiss, 2013), and the need for universal prevention programs regardless of risk status has been strongly advocated given the prevalence of mental health in young adolescents (Conley & Durlak, 2017). Future research should endeavor to implement such universal-based programs in low-income schools and examine SES status as a moderator of intervention benefit.

Summary

Despite the crucial need to clarify the construct and conceptualisation of perfectionism, the theoretical differentiation between a healthy striving for high standards versus perfectionism in the research remains in its infancy. This research has advanced our current understanding of the distinction between pursuing high standards versus pursuing perfection, through illustrating differences in measures commonly used to measure perfectionistic strivings and the relationship they hold with two transdiagnostic processes, self-compassion and self-criticism. To this end, this research adds value by identifying the High Standards subscale from the APS-R as more representative construct of a pursuit of healthy high standards rather than perfection in youth and discourages the notion of perfectionistic strivings as 'adaptive'. Moreover, these findings suggest the mechanisms of response to failure may play a role in the distinction between pursuing perfection and pursing high standards. Perfectionistic concerns, particularly Discrepancy, is solidified as harmful in the context of academic success and well-being for young people. Universal prevention programs are crucial in this realm, and the program detailed in this thesis appears encouraging, but further work is needed. Limitations notwithstanding, the findings provide theoretical and clinical contributions to better understanding the distinction between high standards and perfectionism. However, additional clarification is needed in future research, and further model development, factor-analytic work, and longitudinal studies should endeavour to better understand the mechanisms underpinning strivings, concerns and high standards.

Appendix A

Published Version of Research Summarised in Chapter 3

Psychological Assessment

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Does Perfectionism or Pursuit of Excellence Contribute to Successful Learning? A Meta-Analytic Review

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Confusion exists about the construct of perfectionism, considered to consist of perfectionistic strivings (PS) and perfectionistic concerns (PC). Recent theory suggests that pursuit of excellence is related to PS but differentiated by having a more positive impact. To test this hypothesis, we used a meta-analytic analysis to examine the associations between different measures of perfectionism and academic achievement. Correlations between academic measures (performance, academic burnout and stress, test anxiety, procrastination, self-efficacy, engagement, satisfaction, adjustment, hardiness, learning strategies) and subscales of the Frost Multidimensional Perfectionism Scale, Hewitt Multidimensional Perfectionism Scale, Almost Perfect Scale—Revised, and Child and Adolescent Perfectionism Scale were investigated in students (M_{age} = 19.31, SD = 4.26). A systematic literature search yielded 67 studies (378 effect sizes). Subscales relating to standards (High Standards, Personal Standards, Self-Oriented Perfectionism) were positively related to academic performance and helpful academic outcomes. Only High Standards, which has a focus on striving for excellence, had negative associations with unhelpful academic outcomes. Two of the four subscales that measured PC (Discrepancy, Doubts about Actions) were negatively related to academic performance, and Discrepancy shared a negative association with helpful academic outcomes. All PC subscales were positively associated with unhelpful academic outcomes. As such, PC are maladaptive for successful learning and a distinction between PS and healthy pursuit of excellence is worth further exploration.

Public Significance Statement
This study solidifies the finding that perfectionistic concerns are maladaptive to successful learning and academic achievement. It also provides evidence of the distinction between pursuing excellence and pursuing perfection.

Keywords: perfectionism, standards, concerns, academic performance, achievement

Supplemental materials: http://dx.doi.org/10.1037/pas0000942.supp

Perfectionism is defined as setting excessively high and often unrealistic standards of performance, compulsive and unremitting efforts to attain these standards, measuring self-worth largely or entirely in terms of accomplishment, resulting in self-criticism when standards are not attained (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Shafran, Cooper, & Fairburn, 2002). Based on factor analytical evidence, the various subscales across perfectionism measures are grouped under two higher-order dimensions; perfectionistic strivings and perfectionistic concerns (Cox, Enns, & Clara, 2002; Enns & Cox, 2002; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). *Perfectionistic strivings* (PS) refer to self-oriented excessively high goals, whereas *perfectionistic concerns* (PC) relate to the impact of mistakes, failure, and feelings of discrepancy between one's expectations and perceived performance on feelings of self-worth and identity (Cox et al., 2002).

Mixed Outcomes Associated With Measures of Perfectionistic Strivings

PS have been typically associated with adaptive, healthy outcomes, including life satisfaction (Chang, Watkins, & Banks, 2004), and positive affect (Molnar, Reker, Culp, Sadava, & DeCourville, 2006), whereas PC is associated with psychological maladjustment (Hewitt & Flett, 1991), and a range of psychopathologies including depression, anxiety, and eating disorders (Biel-

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ing, Israeli, & Antony, 2004; Egan, Wade, & Shafran, 2011; Limburg, Watson, Hagger, & Egan, 2017).

Considerable debate has arisen as to whether perfectionism can ever be adaptive (Flett & Hewitt, 2006, 2014; Gaudreau, 2019; Greenspon, 2000), with evidence suggesting that PS is also associated with psychopathology as well as suicidal ideation and self-harm (Limburg et al., 2017; Smith et al., 2018), workaholism (Stoeber, Davis, & Townley, 2013), poorer treatment outcomes for mental illness (Mitchell, Newall, Broeren, & Hudson, 2013), decreased social functioning and feelings of isolation (Magson, Oar, Fardouly, Johnco, & Rapee, 2019) and increased fear and sadness in children and adolescents (Stornelli, Flett, & Hewitt, 2009). Both dimensions of perfectionism have been identified as a transdiagnostic risk factor for a variety of mental health disorders (Egan et al., 2011).

Clarifying the Constructs of Perfectionism and Pursuit of Excellence

One theoretical argument that has emerged to explain the mixed findings with regard to PS is the confusion between measures of the pursuit of perfection versus the pursuit of excellence (Flett, Hewitt, Nepon, & Besser, 2018; Gaudreau, 2019; Wade, 2018). Specifically, there is debate over whether some measures designed to assess PS may be partially confounded with the construct of striving for achievement or excellence, which is unrelated to the core definition of perfectionism (Flett & Hewitt, 2006; Greenspon, 2000). Preliminary evidence (Sherry, Hewitt, Sherry, Flett, & Graham, 2010) has shown that striving for excellence does, indeed, lead to increased work performance in direct comparison to the Self-Oriented Perfectionism subscale from the Hewitt and Flett Multidimensional Perfectionism Scale (HMPS; Hewitt & Flett, 1991).

Further evidence comes from research manipulating scale items. Although the High Standards subscale from the Almost Perfect Scale—Revised (APS-R; Slaney, Rice, Mobley, Trippi, & Ashby, 2001) is considered to measure PS (Rice, Gnilka, Davis, & Ashby, 2019), the wording is more consistent with a healthy pursuit of excellence and associated with helpful outcomes (Leone & Wade, 2018). Blasberg, Hewitt, Flett, Sherry, and Chen (2016) reworded these items to capture the all-or-nothing perfectionistic goals and found this to be associated with unhelpful outcomes, whereas the original wording was associated with helpful outcomes. Longitudinal research has also found that across the HMPS, APS-R, and Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990), only the APS-R High Standards subscale uniquely predicts problem-focused coping (Prud'homme et al., 2017).

The use of various combinations of measures to assess the two dimensions of perfectionism, with little uniformity in the way in which perfectionism is measured (Stoeber & Otto, 2006), has resulted in a crucial need to distinguish between the pursuit of excellence as opposed to the rigid pursuit of perfection, with a new measure produced recently to achieve this goal (Gaudreau, 2019). Moreover, studies vary with the use of semipartial correlations to control for the strong overlap between the two perfectionism dimensions, and it is commonly found that PS are more strongly related to adaptive outcomes when residual PC are removed (i.e., Hill & Curran, 2016). However, a portion of researchers have argued against this method as it may remove the self-critical characteristic of the rigid striving for perfection, and ultimately promote more 'adaptive' outcomes (see Hewitt, Flett, & Mikail, 2017; Hill, 2014).

Because of the adverse consequences of perfectionism, its high prevalence (Hawkins, Watt, & Sinclair, 2006; Sironic & Reeve, 2015) and linear increase in youth (Curran & Hill, 2019), there is an urgent need to better understand the structure of perfectionism, and whether it differs from pursuit of excellence, in terms of impact on adverse and helpful outcomes (Leone & Wade, 2018). This will allow future research better precision for developing effective prevention and early intervention strategies with youth. As such, this meta-analysis focuses on the role of perfectionism and excellence in factors indicating academic success and mental well-being.

Perfectionism in the Academic Environment

Perfectionism is also thought to have an adverse impact on successful learning and academic performance (see Fletcher & Neumeister, 2017, for a review). A recent meta-analysis conducted by Madigan (2019) found that measures of PC displayed a small negative relationship with academic performance (i.e., GPA, self-reported grades), whereas measures of PS had a small positive association. However, studies examining the relationship between perfectionism and other academic-related indicators of achievement yield mixed findings. Although PC has a consistent negative association with factors known to significantly hinder both achievement and well-being, such as increased levels of test anxiety, procrastination, burnout, and decreased levels of academic satisfaction and adjustment (Abdollahi, Carlbring, Vaez, & Ghahfarokhi, 2018; Eum & Rice, 2011; Stoeber, Feast, & Hayward, 2009), the impact of PS on these outcomes is unclear. Generally, PS have been mostly associated with outcomes indicative of academic success, including decreased procrastination (Sirois, Molnar, & Hirsch, 2017), less academic anxiety (Shaunessy, Suldo, & Friedrich, 2011), and increased levels of academic self-efficacy, self-regulated learning strategies, and academic adjustment (Bong, Hwang, Noh, & Kim, 2014; Closson & Boutilier, 2017; Jang & Pak, 2017). There are, however, a few studies in which PS have been associated with higher levels of academic stress (Flett et al., 2016), an absence of protective features from academic-related anxiety (Arana & Furlan, 2016; Cowie, Nealis, Sherry, Hewitt, & Flett, 2018), and higher levels of career indecision and stress (Kang, Lee, & Lee, 2020). To date, there has been no quantitative synthesis of relations between perfectionism and outcomes related to academic achievement using meta-analytic techniques. These are important to consider, as academic performance in isolation is one piece of the puzzle with regard to successful learning and mental well-being for youth in academia, and as such, the understanding of perfectionism in relation to other academic variables including test anxiety, academic stress, academic self-efficacy and academic procrastination is warranted.

The Present Study

The aim of this study was to investigate the relationship of subscales measuring PS and PC to both academic performance and academic outcomes related to achievement and successful learning (cognitive, emotional, and behavioral) across studies using meta-

analytic techniques, with a meta-analysis examining the former (Madigan, 2019), but not associations with broader academic outcomes. To provide this broader perspective, we examined measures of PS and PC across the FMPS (Frost et al., 1990), APS-R (Slaney et al., 2001), HMPS (Hewitt & Flett, 1991), and Child and Adolescent Perfectionism Scale (CAPS; Flett et al., 2016). Subscales reflecting PS included Personal Standards, High Standards, and Self-Oriented Perfectionism. Subscales reflecting PC included Concerns over Mistakes, Doubts about Actions, Discrepancy, and Socially Prescribed Perfectionism.

It was hypothesized that all PC subscales would be negatively related to both academic performance and helpful academic outcomes, while being positively related to unhelpful academic outcomes (see Figure 1 for variable groupings of helpful and unhelpful academic outcomes). With respect to the PS subscales, we predicted these would be positively associated with academic performance, consistent with previous research (Madigan, 2019). However, consistent with previous evidence, we considered the wording of the High Standards subscale from the APS-R to be more consistent with pursuit of excellence than pursuit of PS (Blasberg et al., 2016). It was therefore postulated that the Self-Oriented Perfectionism and Personal Standards subscales would have no association with either helpful or unhelpful academic outcomes, but the High Standards subscale would have positive associations with helpful academic outcomes and negative associations with unhelpful academic outcomes (see online supplementary materials for summary of hypothesized relationships).

Method

Search Strategy

The review process was conducted according to the PRISMA statement (Moher, Liberati, Tetzlaff, Altman, & the PRISMA Group, 2009, see Figure 2). Ethics approval was not needed. A literature search was conducted using PsycINFO, Educational Resource Information Centre (ERIC), Scopus and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) to locate studies investigating the relationship between perfectionism and outcomes indicative of academic achievement. The following keywords and Boolean search terms were combined and searched in the database: (*perfectionism* or *perfectionistic concerns* or *perfectionistic strivings* or *excellence*) AND (*academic* or *achievement* or *learning* or *school* or *university* or *goals* or *motivation* or *burnout* or *procrastination* or *test anxiety*). The search was limited to peer-reviewed articles and articles only in English.

The search yielded 1,708 published studies listed in June 2018 and following the removal of duplicates, 1,654 remained. Titles and abstracts were screened, and studies that did not empirically examine perfectionism in academic settings were removed, resulting in examination of 315 full-text articles with 60 articles meeting inclusion criteria for data extraction. A final search using all databases and forward/backward search was conducted on April 3, 2019, resulting in five additional studies. Two studies were found from a forward/backward search. When insufficient data was supplied within the study to extract effect sizes, authors were contacted (N = 33); 13 (39%) replied and nine provided additional data. In total, 67 studies were included in the analysis.

Relevant Outcomes

The most commonly used measures of academic achievement were used as benchmarks, including grade point average, individual class performance (i.e., end of term grades) and individual test performance (i.e., exams). In addition, self-reported GPA has been shown to be highly correlated with actual GPA (Kuncel, Credé, & Thomas, 2005) and was thus included. The literature contains a variety of academic-related outcomes indicative of academic performance, and as such, outcomes were classified into meaningful categories. Following an extensive search and consolidation of findings from existing literature regarding the relationship between performance and academic outcomes (Fletcher & Neumeister, 2017), three broad categories of outcome were identified: cogni-

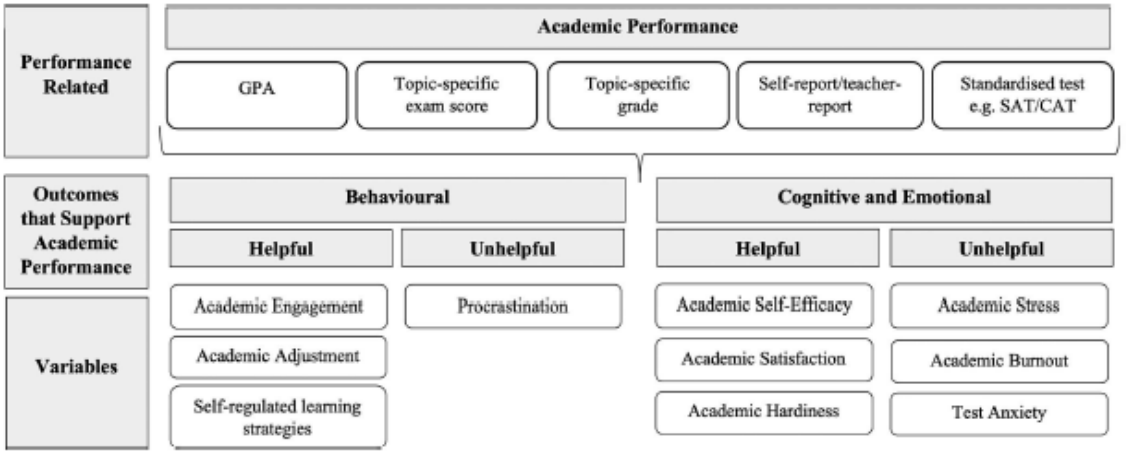

Figure 1. List of academic outcomes included in the meta-analysis.

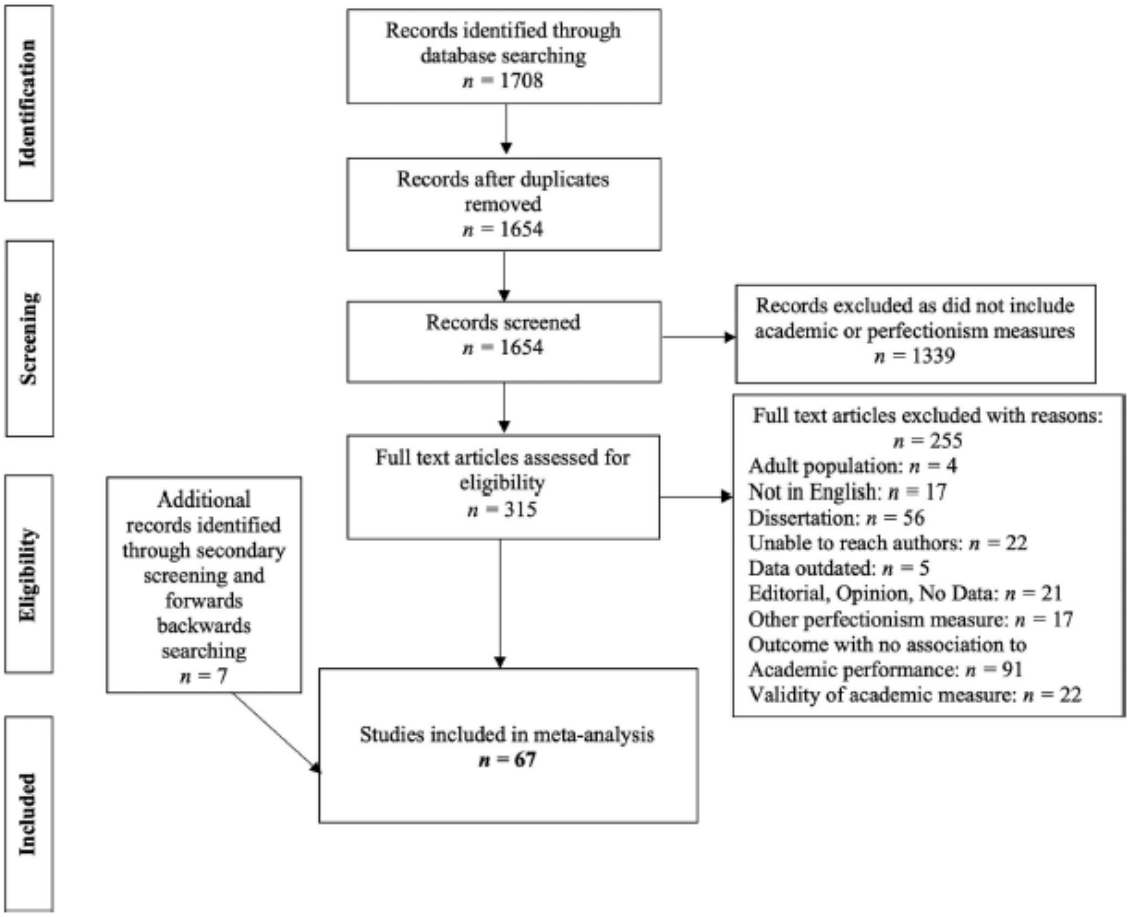

Figure 2. PRISMA diagram of the selection process of studies included in the meta-analysis.

tive, emotional, and behavioral, which were further classified as either helpful or unhelpful (see Figure 1).

Perfectionistic Strivings and Perfectionistic Concerns Perfectionism

This review follows the recommendations of Stoeber and Otto (2006), and previous meta-analytic studies on perfectionism (e.g., Hill & Curran, 2016; Limburg et al., 2017) as a general guideline in classifying subscales into meaningful groups for analysis (see Table 1). As such, subscales from the two most commonly used measures, the FMPS (Frost et al., 1990), and the HMPS (Hewitt & Flett, 1991) were used, in addition to the subscales of the APS-R (Slaney et al., 2001). The Child and Adolescent Perfectionism Scale subscales, which were originally adapted from the HMPS to use in youth (Flett et al., 2016) were merged with the HMPS subscales due to their strong relationship, as demonstrated by previous factor analytic studies (e.g., Bieling et al., 2004; Cox et al., 2002). Following recommendations from previous literature (Cox et al., 2002; Stoeber & Otto, 2006), FMPS-organization, HMPS-other-oriented perfectionism, and APS-R-Order were excluded from this review due to unclear findings on the classification of the two subscales. Moreover, FMPS-parental expectations and parental criticism were omitted as evidence suggests these do not relate to core aspects of perfectionism, but rather are preceding factors involved in upbringing (Stoeber & Otto, 2006).

Inclusion Criteria

Studies were included if they measured both perfectionism and relevant academic outcomes using established, validated self-report scales. Restrictions were placed on study characteristics such that the participant pool should include child, adolescent and young adult or university-sample participants. All studies had to include an effect size (e.g., correlation coefficient), or the relevant information needed was obtained from the corresponding author.

Table 1
Scales Measuring Perfectionism With Classification of Their Subscales Into the Two Major Dimensions of Perfectionism

Scale	Perfectionistic concerns	Perfectionistic strivings
Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990)	Concern over mistakes (CM): Tendency to show negative reactions to mistakes and to interpret mistakes as a failure Doubts about actions (DA): concern that tasks have not been completed properly	Personal standards (PStan): Striving for high standards
Hewitt Multidimensional Perfectionism Scale (HMPS; Hewitt & Flett, 1991)	Socially prescribed perfectionism (SPP): Tendency to expect others to have extremely high standards for him/her and to constantly evaluate him/her for what he/she achieves	Self-oriented perfectionism (SOP): Tendency to set high standards for oneself while also reflecting the intrinsic motivation to reach those standards
Almost Perfect Scale—Revised (APS-R; Slaney et al., 2001)	Discrepancy (D): A sense of being discrepant due to having fallen short of expectations and one's standards	High standards (HS): Tendency to set high standards for oneself
Children and Adolescent Perfectionism Scale (CAPS; Flett et al., 2016)[a]	Socially prescribed perfectionism (SPP): Tendency to expect others to have extremely high standards for him/her and to constantly evaluate him/her for what he/she achieves	Self-oriented perfectionism (SOP): Tendency to set high standards for oneself while also reflecting the intrinsic motivation to reach those standards

[a] Merged with HMPS in analyses.

Studies were required to be peer-reviewed and published in English. Dissertations were excluded to avoid retrieving duplicate effect sizes. Studies that were excluded were identified as not eligible for the above reasons and appropriately coded as such (see Figure 2).

Study Identification

To determine study eligibility, Ivana Osenk and an independent judge (both holding an Honors degree in psychology) examined titles and abstracts of identified studies using the inclusion-exclusion criteria described above. The initial agreement rate for inclusion between the two judges was 95%. Discrepancies were then resolved via a discussion-based approach to reach a consensus, with consultation from Tracey D. Wade. Ivana Osenk assessed all remaining studies in full text and coded them.

Recorded Variables

A coding sheet was completed for each study by Ivana Osenk in the full-text screening process. The coding sheet included (a) publication information (authors/year), (b) sample size, (c) student's age (including mean and range), (d) instructional environment (primary, secondary, tertiary), (e) the instrument and subscale used to measure perfectionistic concerns and perfectionistic strivings, (f) measure of academic achievement or outcome indicative of academic achievement, and (g) the bivariate correlations and 95% confidence intervals (CIs) between the perfectionism subscale and academic outcome.

Statistical Methods

All relevant primary studies examining the relationship between a perfectionism subscale and the relevant academic outcome reported zero-order correlation coefficients, *r*. As such, the zero-order correlation coefficient was obtained and selected as the effect size metric. As such, all analyses were performed using Fisher's *Z* scale (Borenstein, Hedges, Higgins, & Rothstein, 2009), with correlation coefficients being transformed using an online Practical Meta-Analysis Effect Size Calculator (http://www.campbellcollaboration.org/effect-size-calculato.html). Subsequently, Fisher's *Z* results were back-transformed to the appropriate correlation coefficient and reported in order to ease interpretation. Cohen's (1992) recommendations were used to interpret small ($r = .10$), medium ($r = .30$), and large ($r = .50$) effects. Random-effects models are considered to allow generality beyond the present set of studies to future studies (Schmidt, Oh, & Hayes, 2009) and were accordingly used to derive effect sizes and 95% CIs. For studies including multiple effect sizes for academic performance and outcomes indicative of academic performance, the average weighted effect size was used in analyses to avoid overrepresentation of these studies, inflation of sample size and distortion of standard error estimates (Lipsey & Wilson, 2001). The analyses were conducted using Comprehensive Meta-Analysis software (Version 3.3; Borenstein, Hedges, Higgins, & Rothstein, 2005).

Forest plots were produced using *r* values and 95% CI (see the online supplementary materials), and Fisher's *Z* was calculated for each individual study to evaluate heterogeneity. For unhelpful outcomes, a high score indicated a higher level of maladaptive variable associated with lower academic performance (i.e., procrastination, burnout, stress, and test anxiety), whereas high scores on helpful outcomes were ideal in promoting academic success (i.e., adjustment, satisfaction, self-efficacy). Heterogeneity denotes whether the variability in effect sizes within included studies is greater than what would be expected due to random error alone (Cuijpers, 2016), and was evaluated using the Q statistic, a measure of weighted squared deviations around the weighted mean effect size, and the I^2 statistic, whereby 25%, 50%, and 75% suggest low, medium, and high levels of heterogeneity, respectively (Higgins & Thompson, 2002). Lastly, Egger's regression intercept (ERI) was used to assess for publication bias (Egger, Davey Smith, Schneider, & Minder, 1997; Moreno et al., 2009), and funnel plots were generated to detect any asymmetry (Borenstein et al., 2009; see online supplementary materials).

Results

Studies Included in the Meta-Analysis

In total, 67 studies and 21,272 participants were included in the analyses (M_{age} = 19.31 years). Only two studies used a longitu-

dinal design. The two most used perfectionism measures were the APS-R and HMPS (both $n = 24$, 75% overall), followed by FMPS ($n = 17$, 27%), and CAPS ($n = 6$, 9.4%). Overall, 378 effect sizes across 83 independent samples were included in the analysis (see the online supplementary materials for the Supplemental Table containing correlations, study coding, and results for all studies included in the meta-analysis).

Perfectionistic Strivings: The Relationship With Academic Performance and Helpful and Unhelpful Academic Outcomes

Studies with multiple outcomes of academic performance, as well as helpful and unhelpful indicators of academic success, were combined to create an average effect size. With regard to academic performance, our analyses indicated small-to-medium positive relationships for all subscales of PS (see Table 2) with no substantial differences between measures.

In terms of helpful academic outcomes, our analyses indicated High Standards and Personal Standards showed medium positive relationships with helpful academic outcomes known to promote successful learning, whereas Self-Oriented Perfectionism showed a small positive relationship (see Table 2). The overlap of 95% confidence intervals suggest High Standards and Personal Standards had similar effects, however, there appeared to be a larger difference between High Standards and Self-Oriented Perfectionism such that High Standards had a stronger positive relationship with helpful academic outcomes.

When examining this relationship between PS subscales with unhelpful academic outcomes known to hinder successful learning, our analyses revealed High Standards had a small-to-medium negative relationship, whereas Personal Standards and Self-Oriented Perfectionism showed no significant relationship. Subgroup analyses examining the overlap of 95% confidence intervals suggested that all subscales did have some similar effects, but High Standards appeared to have the strongest negative relationship.

Perfectionistic Concerns: The Relationship With Academic Performance and Helpful and Unhelpful Academic Outcomes

Our analyses indicated the subscales of Discrepancy and Doubts about Actions held small negative relationships with academic performance, whereas Concerns Over Mistakes and Socially Prescribed Perfectionism were unrelated (see Table 2). The analysis of 95% CIs suggest Discrepancy had a stronger effect on academic performance in comparison to Concerns over Mistakes and Socially Prescribed Perfectionism.

Discrepancy showed a small-to-medium negative relationship with helpful academic outcomes indicative of academic performance, whereas all other subscales were unrelated (see Table 2). The overlap of 95% CIs reveal Discrepancy held a stronger negative relationship with helpful academic outcomes over and above Concerns Over Mistakes and Socially Prescribed Perfectionism, but not Doubts about Actions.

Finally, our analyses indicated all PC subscales showed small-to-large positive relationships with unhelpful outcomes that hinder successful learning. Of note, subgroup analyses examining the overlap of 95% confidence intervals again suggested that effects were dependent on the perfectionism measure. Discrepancy held a stronger negative relationship with helpful academic outcomes over and above Concerns Over Mistakes, Doubts about Actions and Socially Prescribed Perfectionism. In addition, Socially Prescribed Perfectionism was stronger than Doubts About Actions.

Heterogeneity

An analysis of the heterogeneity of the total weighted mean effects indicated the observed variability across effect sizes likely arose from factors extraneous to sampling error ($Q = 2669.33$, $p < .001$). Moreover, the I^2 indicated a high degree of heterogeneity (93.22%). To explore the sources for observed heterogeneity, we performed additional analyses by calculating Q and I^2 for each perfectionism dimension and academic variable separately. Further analyses revealed moderate to high degrees of heterogeneity for each subgroup (see Table 3 for Q and I^2 values for all categories). This supports the usefulness of focusing on the observed effect sizes for each subgroup rather than perfectionism and academic outcomes as a whole.

Publication Bias

To assess publication bias, a p value of $< .05$ was used as the metric, as it indicates a significant relationship between the effect size and precision. In addition, the 95% CI of Egger's regression coefficient was indicative of publication bias if it was not greater

Table 2
Average Effect Sizes and 95% Confidence Intervals (CI) for Subscales of Perfectionism and Academic Outcomes

	Academic performance		Helpful academic outcomes		Unhelpful academic outcomes	
Perfectionism subscale	*r*+	95% CI	*r*+	95% CI	*r*+	95% CI
Perfectionistic strivings						
High standards	.25*	[.21, .29]	.39*	[.31, .44]	−.23*	[−.41, −.01]
Personal standards	.25*	[.20, .30]	.34*	[.22, .45]	−.11	[−.25, .05]
Self-oriented perfectionism	.22*	[.12, .26]	.25*	[.15, .33]	.02	[−.08, .13]
Perfectionistic concerns						
Discrepancy	−.17*	[−.19, −.14]	−.22*	[−.28, −.15]	.45*	[.40, .50]
Concerns over mistakes	.06	[−.00, .12]	−.03	[−.07, .02]	.17*	[.06, .27]
Doubts about actions	−.08*	[−.16, −.00]	−.10	[−.20, .02]	.15*	[.07, .20]
Socially prescribed perfectionism	−.06	[−.13, .01]	−.04	[−.11, .04]	.25*	[.20, .29]

* $p < .05$.

Table 3
Analysis of Heterogeneity (Q;I^2) and Publication Bias (ERI) for Each Perfectionism Dimension and Academic Outcome Category

Categories	Q test[a]	I^2 test[a]	ERI [95% CI][b]
Perfectionistic strivings			
Performance	171.76*	70.89	0.41 [−1.10, 1.92]
Helpful outcomes	238.96*	88.70	−1.93 [−7.94, 4.08]
Unhelpful outcomes	535.33*	94.58	8.75* [2.69, 14.81]
Perfectionistic concerns			
Performance	216.38*	73.20	−1.08 [−2.50, 0.34]
Helpful outcomes	228.34*	84.23	−2.57 [−6.74, 1.60]
Unhelpful outcomes	242.56*	87.22	4.06 [−0.03, 8.16]

Note. CI = confidence interval.
[a] Indicates tests of heterogeneity. [b] Indicates publication bias where ERI = Eggers' regression intercept.
* $p < .05$.

than zero (Laird, Tanner-Smith, Russell, Hollon, & Walker, 2017). Studies were initially combined in a single analysis, which revealed no indication of publication bias (ERI = −1.39, $p = .31$). However, when studies were grouped by perfectionism dimension and academic variable category (performance, helpful outcome, unhelpful outcome), publication bias was detected for perfectionistic strivings when grouped with helpful academic outcomes only (see Table 3 for ERI values across all categories). Thus, estimates of the relationship between perfectionistic strivings and helpful academic outcomes need to be interpreted cautiously.

Discussion

As hypothesized, we found all measures of PS were significantly related to higher academic performance and helpful learning outcomes. The strength of this relationship depended on the measure, such that High Standards had a stronger positive association with helpful academic outcomes compared to Self-Oriented Perfectionism. Moreover, only High Standards was negatively related to outcomes that commonly hinder successful learning, whereas other PS measures had no effect. Conversely, only two measures of PC had a harmful effect on academic performance, while all measures were positively related to unhelpful academic outcomes. Discrepancy was the only subscale to show a negative relationship to helpful outcomes that foster academic achievement. The present study offers preliminary evidence for the distinction between PS and pursuit of excellence.

Perfectionistic Strivings and Successful Learning

Consistent with the previous findings of Madigan (2019), we found all measures of PS showed a small-medium positive relationship with academic performance. However, collectively, these results suggest that these measures differ in the effect they have on successful learning. In particular, High Standards appears to foster successful learning and protect against the effect of harmful academic outcomes, whereas other PS measures, despite their (less) positive relationship with performance and helpful outcomes per se, do not provide a protective relationship against common barriers that hinder successful learning.

Evidence suggests that High Standards from the APS-R may not adequately capture the 'all or nothing' thinking and rigid pursuit of perfection, and rather reflects a healthy striving for excellence (Blasberg et al., 2016). High Standards not only shared a positive relationship with helpful outcomes of successful learning over and above Self-Oriented Perfectionism, but importantly served as a protective factor against outcomes such as text anxiety, academic burnout and stress. This was not the case for Personal Standards and Self-Oriented Perfectionism, which may indicate these two measures are more reflective of the perfectionism construct and suggest PS are not completely "adaptive." These findings also suggest why mixed results exist about the adaptiveness of PS. It is important to note, however, the helpful nature of Personal Standards and Self-Oriented Perfectionism in promoting academic performance and helpful outcomes cannot be ignored and is less in keeping with our overall premise of the general 'maladaptive' nature of PS. It may, however, point to the possibility that in times of stress and failure, individuals high in perfectionistic strivings are vulnerable to psychological distress, and may explain why Personal Standards and Self-Oriented Perfectionism shared no relationship with maladaptive academic variables (Hewitt & Flett, 1993). Accordingly, the present findings reiterate the continuing complexity of this construct and the importance of future research in this area.

Perfectionistic Concerns and Successful Learning

Contrary to our hypothesis, but consistent with Madigan (2019), we did not find that all measures of PC had a negative association with academic performance. Discrepancy appeared to have the most harmful effect. This is unsurprising, as the subscale focuses on the distress caused due to differences between one's standards and actual performance. Doubts about Actions also shared a negative effect on academic performance. However, it is surprising to note the lack of relationship between academic performance with Concerns over Mistakes and Socially Prescribed Perfectionism. There were similar findings for helpful outcomes indicative of successful learning. Discrepancy once again appeared to have the strongest negative impact on buffering the effects of outcomes typically associated with academic success, whereas all other measures of PC seemed to have no maladaptive impact on outcomes commonly aiding successful learning. This is inconsistent with previous research establishing the maladaptive nature of these two measures in mental health outcomes (Limburg et al., 2017; Smith et al., 2018) and, as such, our results suggest perhaps the characteristics of Discrepancy have the most harmful impact in educational settings.

As predicted, all dimensions of PC showed a small to strong positive relationship with maladaptive learning outcomes such as test anxiety, procrastination, and academic burnout, with Discrepancy again the strongest predictor. Given the strong relationships these unhelpful academic outcomes hold with general psychological distress in previous literature (i.e., Limburg et al., 2017), it is unsurprising that all the perfectionism measures were positive predictors in this context. Taken together, our results indicate PC do promote unhelpful learning outcomes, and the characteristics of Discrepancy appear to be particularly maladaptive and should accordingly be targeted in intervention work.

Limitations and Recommendations for Future Research

The results of this study should be interpreted in the context of the following limitations. First, all but two studies included in the meta-analysis were cross-sectional in nature, which ultimately limits the causal conclusions that can be drawn with regard to the effects of perfectionism on successful learning. Further studies are required that not only measure the longitudinal effects of perfectionism with regard to learning, but also the effects of manipulating such perfectionism through experimental design. Second, our samples were limited to academic-related variables and students, and as such, our results may not generalize to populations with the absence of constant performative evaluation and emphasis on achievement inherent in academic environments.

A third limitation was the broad inclusion of various outcomes used to encompass the idea of successful learning in the education sphere. Previous research guided the categorization of outcomes to ensure that helpful and unhelpful academic variables were not only related with academic performance but had small-large associations with each other (i.e., see Hattie, 2008, for an extensive review). For example, procrastination and test anxiety are known to have strong positive correlations (van Eerde, 2003), whereas self-regulated learning strategies and academic self-efficacy have been shown to be related to academic adjustment (Cazan, 2012). Nevertheless, it is possible the current grouping and exclusion of outcomes in this analysis may not be the most optimal categorization to define this broad concept. The idea of successful learning is an important avenue for future research, and thus we call for work in this area to clarify the concept of successful learning in an academic realm. In the same vein, we restricted the inclusion of perfectionism measures to the most commonly used measures within the literature and future consideration of pertinent new measures is required.

A fourth limitation was the high level of heterogeneity was observed, which was unsurprising given the different perfectionism subscales included. This commonly indicates the need to conduct moderator analyses. With an average benchmark of 10 primary studies needed to evaluate moderator variables (Dalton & Dalton, 2008), we did not have sufficient numbers of studies in each categorization, so we were unable to conduct separate moderator (i.e., level of education, giftedness). Further research is thus needed to ensure less biased estimates of effect sizes. In addition, the inclusion of peer-reviewed, published studies in an attempt to reduce the duplication of results may allow the oversight of unpublished or under review studies, as well as buy into the "file drawer" effect (Rosenthal, 1979). Publication bias was noted for PS and helpful learning outcomes only, and our findings should be interpreted with this in mind. It is possible that the file drawer effect has impacted on the average effect size observed for this relationship, and thus reduces our confidence of this estimate. It should also be noted 35 studies were identified as relevant for inclusion, but additional data was needed to establish the correlations for separate rather than grouped perfectionism subscales. However, only nine studies (26%) were able to be included in the current analyses.

In terms of future work, highlighting the distinction between pursuit of excellence and pursuit of perfection is a welcome and novel approach for developing a better understanding the nature of PS (Gaudreau, 2019). We advocate that future research seeks to differentiate pursuit of perfection from pursuit of excellence. Although PC has a strong association with psychopathology, this work will have the benefit of further clarifying the unique role of PS as a transdiagnostic risk factor for mental health impairment. More complex modeling is required, as the relationship between PS and increased academic performance cannot be ignored, but this relationship may be moderated by stress (Hewitt & Flett, 1993). Some researchers have suggested that facets of conscientiousness are the key feature in separating healthy strivings of excellence from perfectionism (Blasberg et al., 2016). Gaudreau (2019), however, strongly argues against the conflation of excellence with conscientiousness given that both excellence and perfectionism are not classified as personality dimensions, but characteristic adaptations that should be separated from personality facets. We suggest that the influence of other variables that may distinguish between perfectionism and excellence need to be considered such as self-criticism (Dunkley & Blankstein, 2000) and self-compassion (Mehr & Adams, 2016).

Although intervention studies have shown evidence that targeting PS can increase well-being (Fairweather-Schmidt & Wade, 2015; Vekas & Wade, 2017), research is yet to investigate the longitudinal effects of an intervention that targets both Discrepancy and the rigid pursuit of perfection, while fostering the idea of high standards and excellence. As such, future research should focus on the longitudinal effects of targeting these characteristics on learning and well-being, such as focusing on the benefits of failure while striving for high standards of achievement.

Practical Implications and Conclusion

The present study contributes to clarifying the structure of perfectionism by actively differentiating pursuit of excellence from the pursuit of perfection. Careful consideration of the choice of perfectionism subscales to indicate risk of maladaptive outcomes is required. Our results suggest the subscale Discrepancy may be the most useful measure to implement in school-based settings to reveal children and adolescents at high risk of hindering their academic success. Self-Oriented Perfectionism and High Standards may be used clinically to distinguish goal-oriented students actively pursuing perfection who may be at risk of adverse consequences at a time of stress versus those pursuing high standards without such adverse consequences. This information, with aforementioned limitations and need for further research kept in mind, can be used to inform targeted prevention approaches in educational settings.

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