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The Relationship between Perfectionism and Procrastination: Examining Trait and Cognitive Conceptualizations, and the Mediating Roles of Fear of Failure and Overgeneralization of Failure

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ABSTRACT

The relationship between perfectionism and procrastination has been established in the literature; however, findings regarding the magnitude of this correlation are inconsistent. Some studies found small-to-medium effects between trait-perfectionism and trait-procrastination, while others found large effects between perfectionistic cognitions and procrastinatory cognitions, suggesting that the association may be stronger when assessed from a cognitive perspective. The present study addressed this inconsistency, by exploring this association using both trait and cognitive measures. There was a significant and positive correlation between perfectionism and procrastination, and the largest effect size was observed between perfectionism (trait and cognitive measures) and procrastinatory cognitions, suggesting that perfectionists are not necessarily procrastinating more but are rather more cognitively distressed by their procrastinatory tendencies.

This study also addressed the mediating roles of two variables: fear of failure (FF), and overgeneralization of failure (OGF). While previous research showed that FF is linked to both perfectionism and procrastination, the role of OGF in this association has been unexamined. Findings in this study showed that FF mediated all (trait and cognitive) pathways between perfectionism and procrastination, and OGF mediated almost all pathways. Further, there was a sequential mediation, via FF followed by OGF, for all (but one) pathways between perfectionism and procrastination. This finding suggests that fear of failure predicts the tendency to overgeneralize failures to one's global sense of self, and this combination of effects drives the association between perfectionism and procrastination.

KEYWORDS: perfectionism; procrastination; perfectionistic cognitions; procrastinatory cognitions; perfectionistic strivings; perfectionistic concerns; fear of failure; overgeneralization of failure

SUMMARY FOR LAY AUDIENCE

Perfectionism is the tendency to set unrealistically high standards for oneself, and to be critical of one's own behaviours. Procrastination is the irrational delay of an intended action, that occurs with awareness of the long-term negative consequences of this delay. Studies have found that perfectionism and procrastination are positively correlated, but mixed findings exist regarding the strength of this relationship. Some studies reported a small-to-medium magnitude, while others reported a large magnitude in the correlation between perfectionism and procrastination. It appears that, when the constructs are measured from a cognitive perspective (underlying thoughts), the correlation is stronger than when they are measured from a trait perspective (tendencies and behaviours). The present study addressed this inconsistency, by exploring both trait and cognitive perspectives. The relationship between perfectionism and procrastination was significant and positive, and the strongest relationship occurred when procrastination was measured from a cognitive perspective, suggesting that perfectionists are not necessarily procrastinating more but are rather more cognitively distressed by their procrastinatory tendencies.

This study also addressed the mediating roles of two variables: fear of failure (FF), and overgeneralization of failure (OGF). FF occurs when an individual is afraid of failure because there are negative consequences associated with failure, while OGF occurs when an individual generalizes a failure to his/her global sense of self (e.g., "I am a failure"). While previous research showed that FF is linked to both perfectionism and procrastination, the role of OGF in this association has been unexamined. Findings in this study showed that FF mediated all the relationships between perfectionism and procrastination (when they were assessed from both trait and cognitive perspectives), and OGF mediated almost all of the relationships. Further, there was a sequential mediation, via FF followed by OGF, for all (but one) relationships between perfectionism and procrastination. This finding suggests that FF predicts the tendency to overgeneralize failures to one's global sense of self, and this combination of effects drives the association between perfectionism and procrastination.

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CHAPTER 1: INTRODUCTION

1. Introduction

1.1 Perfectionism and Procrastination – Overview

Perfectionism and procrastination are both forms of self-regulation failure (Sirois et al., 2017). While previous studies have established the association between these constructs (e.g., Smith et al., 2017), these studies assessed perfectionism and procrastination using mostly trait-driven measures, failing to account for the thought processes underlying these constructs. This poses a limitation in the literature, as a comprehensive understanding of any personality construct necessitates an exploration of the related cognitive components, in addition to the trait-like tendencies, that underlie the given construct (Mischel & Shoda, 1995). As such, the first objective of this study was to examine the relationship between perfectionism and procrastination, using both trait and cognitive measures.

1.1.2 Perfectionism

Perfectionism is a complex construct; its multidimensional nature has made this construct exceedingly difficult to define (Stoeber, 2018). Trait-driven conceptualizations of perfectionism define it as a personality trait, encompassing the tendency to set excessively high standards for performance, and engage in critical evaluations of one's own behaviours (Frost et al., 1990; Hewitt & Flett, 2002). Research has linked this personality trait to a decline in well-being (Curran & Hill, 2017). High levels of perfectionism have also been linked with mental illnesses (DiBartolo et al., 2008), including depression, anxiety, and even suicidality (Casale et al., 2020; Flett et al., 1998; Kawamura et al., 2001; Smith et al., 2018).

Although the vast majority of perfectionism research has occurred in the last few decades, this construct is hardly novel to personality research (Stoeber, 2018); it was first coined by Karen Horney who listed perfectionism as one of ten "neurotic needs", and described it as "the tyranny of the shoulds" (Horney, 1950). Hamachek (1978) shed further light on the complexity of perfectionism, suggesting that it exists in two forms: Normal and Neurotic. While normal perfectionists enjoy the pursuit of striving and accept that they may occasionally fall short of their standards, neurotic perfectionists are consumed by their standards and struggle to be satisfied with any performance that is less than perfect (Hamachek, 1978; Stoeber, 2018). Hamachek's description of the multi-faceted nature of perfectionism was revived a decade later when two separate multidimensional models of perfectionism were devised and reflected in two

of the most often used perfectionism scales today.

The Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990) delineates six different trait-dimensions of perfectionism: personal standards, concern over mistakes, doubts about actions, organization, parental expectations, and parental criticism. Personal standards (PST) encompass high expectations for performance that perfectionists impose on themselves. Concern over mistakes (CM) is the tendency to have an overly negative appraisal of mistakes, such that even minor shortcomings are perceived as failures. Doubts about actions (DA) refer to having uncertainty about day-to-day actions (e.g., not knowing what to do in a situation) and about one's own performance (e.g., not knowing if a task is done well enough). Organization (O) refers to one's need for order and neatness. Parental expectations (PE) refer to high standards imposed upon an individual by his/her parents, and parental criticism (PCR) refers to parents' critical evaluations of any performance that falls short of these demands. The subscales of personal standards, concerns over mistakes, doubts about actions, and organization reflect a personal need for perfection, whereas the subscales of parental expectations and parental criticism reflect a perceived demand for perfection, from others.

The Hewitt and Flett Multidimensional Scale (HFMPS; Hewitt & Flett, 1991; 2004) is another trait model of perfectionism that distinguishes between three trait-dimensions of perfectionism: Self-oriented perfectionism (SOP), socially prescribed perfectionism (SPP), and others-oriented perfectionism (OOP). SOP refers to an individual's tendency to set high personal standards for himself/herself, SPP is an individual's belief that others have established high standards for him/her, and OOP refers to an individual's tendency to set high standards for others. While SOP and SPP represent perceived high standards directed toward the self, OOP individuals demand perfection from others.

Factor analytic studies using both of these models revealed that dimensions of the FMPS and HFMPS could be combined into one model, with two overarching factors: Personal Standards Perfectionism and Evaluative Concerns Perfectionism (Frost et al., 1993; Bieling et al., 2004), also known as Perfectionistic Strivings (PS) and Perfectionistic Concerns (PC), respectively. PS reflect the tendency to set excessively high standards for oneself, while PC reflect the tendency to be overly concerned with making mistakes and with receiving negative evaluations (Stoeber & Otto, 2006). Thus, PS is comprised of 2 dimensions: personal standards, and self-oriented perfectionism; and PC is comprised of 3 dimensions: concerns over mistakes,

doubts about actions, and socially prescribed perfectionism. Consequently, 5 of the 9 subscales of the FMPS and HFMPS were incorporated into the 2-factor model. PS and PC have demonstrated differential associations with positive and negative outcomes. While PS correlated with positive affect, confidence, and goal-driven behaviours (Frost et al., 1993; Stoeber et al., 2008), PC was related to negative affect, anxiety and depression (Damian et al., 2017; Frost et al., 1993; Flett et al., 1998). Yet, recently, the adaptive nature of PS has come into question, as researchers discovered that PS can also be implicated with negative outcomes such as depression, anxiety, and even suicidality (Nepon et al., 2011; Smith et al., 2016; 2018).

While much has been gained from exploring these trait-like tendencies and behavioural patterns of perfectionists, it has come to light that these trait-models alone do not sufficiently capture all aspects of the perfectionism construct (Flett et al., 2018). A comprehensive understanding of perfectionism, or any other personality construct for that matter, cannot be attained without lending consideration to the cognitive elements underlying that construct (Cantor, 1990; Flett et al., 1998). Thus, a major limitation of the current perfectionism literature is that it has been largely trait-driven (Casale et al., 2020).

Cognitive factors play a role in perfectionism, often in the form of negative appraisals and ruminations (Flett et al., 2015; 2018). Perfectionists are often concerned with the evaluative consequences of their perceived failures and are thus likely to react to personal shortcomings with harsh criticism (Flett et al., 2007), a phenomenon known as Perfectionistic Reactivity (Flett & Hewitt, 2016). Thereafter, self-criticism perpetuates a cycle of rumination (Flett et al., 2007; 2018), such that, for the perfectionist, any situation that reflects a failure to meet expectations is accompanied by a pattern of self-critical thoughts about imperfections (Flett et al., 1998). Perhaps excessive rumination is a cognitive mechanism to prevent future shortfalls, by drawing one's attention to the discrepancy between one's current self and future self. Hewitt and Genest (1990) discovered that perfectionists indeed have two distinct self-schemas: the current self-schema and the ideal self-schema. The current self-schema refers to one's current state, while the ideal self-schema represents the "perfect" self, drawing attention to deficits in the current self. While these self-schemas may exist for all individuals, the ideal self-schema is highly activated in perfectionists (Hewitt & Genest, 1990), rendering excessive rumination about one's flaws. Thus, perfectionistic cognitions are reoccurring, automatic thoughts about the need to be perfect and fear of falling short of perfection (Flett et al., 1998), which are activated in response to

perceived discrepancies between the current self and ideal self. The Perfectionism Cognitions Inventory (PerfCI; Flett et al., 1998) was devised to capture these cognitive elements of perfectionism.

While perfectionistic cognitions are closely associated with PC dimensions (concerns over mistakes, doubts about actions, and socially prescribed perfectionism), they are also unique in that they reflect automatic, schematic reactions rather than stable dispositions (Flett et al., 1998; 2007). Furthermore, trait measures of perfectionism do not assess the frequency of cognitive activation, in the form of perfectionism-specific ruminations (Flett et al., 1998). Thus, perfectionistic cognitions capture a unique component of the perfectionism construct, which warrants the need to assess perfectionism from both trait and cognitive perspectives (Casale et al., 2020).

1.1.3 Procrastination

Like perfectionism, procrastination is often explored as a personality trait. It is defined as the "the tendency to postpone that which is necessary to reach some goal" (Lay, 1986, p.475). It occurs when an individual voluntarily delays starting or completing a task, despite knowing that this delay will eventually lead to detrimental consequences (Lay, 1986; Steel, 2007). As there is no "good reason" for the procrastination, it is often termed as an 'irrational' delay (Steel, 2007), reflecting "self-damaging behaviour" (Flett et al., 2016). Damaging indeed it is; procrastination has been linked with maladaptive consequences, including increased levels of stress (Flett et al., 1995), depression (Stainton et al., 2000), and suicidality (Klibert et al., 2011).

That procrastination is conceptualized and explored as a personality trait is not surprising, given that it has been repeatedly associated with high trait-impulsivity and with low conscientiousness (see Steel, 2007). As such, numerous scales have been developed to assess procrastination from a trait perspective. Of those, the General Procrastination Scale (GPS; Lay, 1986) is one that is commonly used to assess trait-like tendencies and general behavioural patterns associated with procrastination (e.g., "I often find myself performing tasks that I had intended to do days before"). While such trait-measures provide insight, they are not without limitations. As it has been observed with the perfectionism construct, trait measures such as the GPS and other scales of this kind do not capture the underlying thoughts that procrastinators experience in the moments before or during task-avoidance (Stainton et al., 2000). A comprehensive assessment of any personality construct requires an exploration of the cognitive,

affective, and behavioural patterns associated with that construct (Mischel & Shoda, 1995); thus, an understanding of the cognitive elements underlying procrastinatory behaviours is essential.

The Procrastinatory Cognitions Inventory (ProcCI; Stainton et al., 2000) has been devised in response to this limitation. Stainton and colleagues (2000) explain that individuals who often engage in procrastinatory behaviours are also likely to experience automatic, negative thoughts about the self (e.g., "I'm such a procrastinator, I'll never reach my goals") and about the task at hand (e.g., "I need to start earlier"). These self-critical thoughts become activated when individuals engage in procrastinatory behaviours, such that, over time, the thoughts become an integral component of procrastinators' self-schema and are, thus, termed 'automatic procrastinatory cognitions'. As such, the ProcCI is not simply a measure of thoughts associated with procrastination, but it also captures the degree of cognitive distress that procrastinators may experience. In fact, Stainton et al. (2000) found that the ProcCI predicted distress above and beyond trait measures of procrastination.

1.1.4 Perfectionism and Procrastination

The relationship between perfectionism and procrastination has been reported in the research literature (see Sirois et al., 2017), and findings show that these constructs are indeed significantly correlated. From a trait perspective, studies have shown that the superordinate dimensions of PS and PC have differential associations with trait procrastination (Sirois et al., 2017). Dimensions of PC have been found to be significantly and positively correlated with trait-procrastination (Sherry et al., 2016; Sirois et al., 2017; Smith et al., 2017); individuals who are overly concerned about making mistakes, filled with self-doubts, and preoccupied with others' evaluations are likely to engage in procrastination behaviours, such as delaying starting or completing important tasks. In contrast, dimensions of PS, which are characterized by high self-imposed standards, were found to be negatively associated with trait-procrastination (Sirois et al., 2017; Smith et al., 2017); individuals who demand perfection of themselves and strive for flawless performance are unlikely to engage in procrastination behaviours. From a cognitive perceptive, Flett, Stainton, and colleagues (2012) reported that perfectionistic cognitions significantly and positively correlated with procrastinatory cognitions. Individuals who experience negative automatic thoughts about the need to attain perfection are also likely to experience negative thoughts reflecting concern about procrastination tendencies.

In examining the literature, however, it becomes clear that studies exploring the

associations between perfectionism and procrastination have been dominated by trait models, as have studies examining perfectionism and procrastination separately. In fact, a significant limitation of the most recent meta-analysis on the perfectionism-procrastination association (Sirois et al., 2017) is that both perfectionism and procrastination were assessed solely from a trait perspective, rendering an analysis that does not at all address the role of cognition in this association. To the researcher's knowledge, only one study examined the perfectionism-procrastination association from a cognitive perspective, and there are no studies that examined the interplay between trait and cognitive measures (e.g., the relationship between trait-perfectionism and procrastinatory cognitions, and between perfectionistic cognitions and trait-procrastination). Thus, the first objective of this study was to examine the association between perfectionism and procrastination, using both trait and cognitive measures, as per the following hypothesis:

>**Hypothesis 1:** *Perfectionistic strivings and perfectionistic concerns (trait dimensions) will show differential associations with procrastination; perfectionistic strivings will significantly and negatively correlate with procrastination (with both trait and cognitive measures), while perfectionistic concerns will significantly and positively correlate with procrastination (with both trait and cognitive measures). Perfectionistic cognitions (cognitive measure) will significantly and positively correlate with procrastination (with both trait and cognitive measures).*

Another limitation in the literature is that the findings regarding the magnitude of the association between perfectionism and procrastination are inconsistent. In their meta-analysis, Sirois et al. (2017) found a small-to-medium, positive average effect size ($r = .23$) between PC and trait-procrastination, and a small-to-medium negative average effect size ($r = -.22$) between PS and trait-procrastination. Yet, Flett, Stainton, and colleagues (2012) found a large and positive effect size ($r = .52$) in the association between perfectionistic cognitions and procrastinatory cognitions. As it stands, there is a lack of clarity in the literature regarding the magnitude of the association between perfectionism and procrastination. Thus, another purpose of this study was to address this inconsistency, and to clarify if differences in effect sizes are attributable to the nature of the measures being employed (e.g., trait versus cognitive measures).

In order to determine the degree to which perfectionism and procrastination correlate, it is necessary to first explore the underlying causes shared between these constructs. While there are

many competing explanations, the finding that both perfectionists and procrastinators experiences self-regulation failures has been recently presented by Sirois and colleagues (2017) and is further explored in this study. Self-regulation is a broad term that refers to an individual's ability to regulate affective, cognitive, and behavioural states that arise in the short-term and may impede long-term goal fulfillment (McClelland et al., 2010). For instance, when tasks are perceived to be boring, difficult, unurgent, or even worth-challenging, the decision to disengage reflects a prioritization of short-term desires (Steel, 2007). Self-regulation failure is a central theme in procrastination literature, as research shows that procrastinators often prioritize short-term needs at the expense of long-term goals (Tice & Baumeister, 1997). From the perspective of emotion regulation, when the task at hand becomes associated with negative emotions, those who cannot cope with such emotions may be inclined to procrastinate (Tice & Bratslavsky, 2000; Sirois & Pychyl, 2013); disengaging from the task allows the procrastinator to disengage from the negative emotions related to that task.

Sirois and colleagues (2017) extended these findings in proposing that self-regulation failures are common to both perfectionists and procrastinators, and that self-regulation failures drive the association between perfectionism and procrastination. According to their control theory of self-regulation, the failure to exert the behavioural control necessary to engage in a task occurs when the perfectionist, having high standards and high self-doubts, perceives that a certain goal is not attainable. The perfectionist first perceives a discrepancy between the current state and desired state and, further, deems that he/she does not have the capabilities to reduce this discrepancy. Upon deciding that one's efforts will be in vain, the perfectionist disengages from the task, which leads to procrastination. While this theory describes the role of behavioural control in self-regulation failure in the context of the perfectionism-procrastination association, it does not address the possible role of emotion in self-regulation failure.

As studies have shown that both perfectionists and procrastinators engage in maladaptive emotion-regulation strategies (Sirois & Pychyl 2013; Pychyl & Sirois, 2016), it is possible that emotion-regulation failure (Tice & Bratslavsky, 2000) may explain the association between perfectionism and procrastination. For the perfectionist, starting or completing important tasks may be daunting; since the perfectionist tends to set unrealistic standards, to be concerned with other's evaluations, and to be afraid of making mistakes, these harsh circumstances can trigger unpleasant emotions (Stoeber et al., 2014). In turn, the perfectionist reacts with a defensive

coping style: avoidance (Stoeber et al., 2008); avoiding the task allows the perfectionist to avoid the negative emotions associated with it and, thereby, procrastination provides an immediate recovery from the unpleasant emotional state. As such, this theory is also called 'short term mood repair' (Pychyl & Sirois, 2016). Although the perfectionist may be aware of the detrimental consequences of delaying, he/she prioritizes an improvement in the current mood over the commitment to long-term goals, reflecting poor emotion-regulation strategies (Tice & Bratslavsky, 2000; Sirois & Pychyl, 2013).

Understanding the association between perfectionism and procrastination from the perspective of emotion-regulation can also provide insight on the magnitude of this association. Both the PerfCI and the ProcCI assess negative thought patterns, in the form of ruminations. As studies show that ruminators are more likely to experience negative emotions than those who do not ruminate (Morrow & Nolen-Hoeksema, 1990), it may possible that the ruminative components of perfectionism and procrastination may trigger negative emotions to a stronger extent than traits would. Interpreting this finding in the context of emotion-regulation theory would suggest that: perfectionistic cognitions would exacerbate negative affect, which would further promote avoidant coping strategies and amplify the effects on procrastination. In addition, the ruminative component of procrastinatory cognitions would allow for these negative emotions to remain salient, possibly to a greater extent than procrastinatory traits would. This may explain why Flett, Stainton and colleagues (2012) found that, when both constructs were examined from a cognitive perspective, the magnitude of the perfectionism-procrastination association was relatively large. Thus, in line with these findings and with the emotion-regulation theory, the following is hypothesized:

> *Hypothesis 2: The magnitude of the correlations between perfectionism and procrastination will vary, from largest to smallest effect size, as follows: (1) correlation between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association); (2) correlation between perfectionistic cognitions and trait-procrastination (cognitive-trait association); (3) correlation between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association); and (4) correlation between perfectionistic concerns and trait-procrastination (trait-trait association).*

Further, if the cognitive components of perfectionism do indeed amplify the association between perfectionism and procrastination, then it is also reasonable to explore the incremental

validity of the Perfectionism Cognitions Inventory. Flett, Stainton and colleagues (2012) provide support for the possibility that perfectionistic cognitions may predict procrastinatory cognitions beyond trait-measures of perfectionism, yielding in the following hypothesis:

> **Hypothesis 3**: *Perfectionistic cognitions will explain the variance in procrastinatory cognitions above and beyond the variance accounted by trait-perfectionism (perfectionistic strivings and perfectionistic concerns).*

1.2 Perfectionism, Procrastination, and Fear of Failure

Fear of failure (FF) is a state of concern that individuals may experience in response to perceived failures, when those failures are associated with negative consequences (Birney et al., 1969; Conroy, 2002). As such, FF represents an irrational belief – the belief that being unable to fulfill a goal will result in adverse consequences (Haghbin et al., 2012). Irrational beliefs of this kind are highly familiar to both perfectionists and procrastinators, and fear of failure has been found to be a significant and positive correlate of both perfectionism and procrastination (Flett et al., 1995). Solomon and Rothblum (1984) found that FF constituted a large proportion of the reported causes for procrastination. Similarly, Frost and colleagues (1990) discovered that FF was correlated with all FMPS trait dimensions of perfectionism, except for organization. Further, Conroy (2007) found that, of all dimensions of the HFMPS, fear of failure most strongly correlated with socially prescribed perfectionism, indicating that FF may be especially salient to perfectionists who are concerned with others' evaluations. Furthermore, Flett, Stainton, et al. (2012) examined the association between all of these three constructs, and reported that both perfectionistic cognitions and procrastinatory cognitions strongly correlated with FF.

Interestingly, while FF has been identified as a central component to both perfectionism and procrastination, the mediating role of FF in the procrastination-perfectionism association has not been examined. As previous findings demonstrate that these variables are correlated, it is plausible that perfectionism predicts FF, which predicts procrastination. As the perfectionist is often afraid of making mistakes, a challenging task may raise fear because it may lead to failure, and failure entails adverse consequences for the perfectionist (Conroy et al., 2007). As further support for the emotion-regulation theory described earlier, fear of failure has been found to predict negative affect (Sagar & Stoeber, 2009), and, for the individual who responds to emotional challenges with maladaptive coping strategies, negative affect may promote avoidance

in the form of procrastination (Tice & Bratslavsky, 2000). Thus, the following hypothesis is explored:

> **Hypothesis 4.1** *Fear of failure will mediate all (cognitive, trait, and mixed) pathways between perfectionism and procrastination.*

As this is the first study to explore the mediating effect of FF in the relationships between perfectionism and procrastination, it is also of interest to examine if the magnitude of this mediating effect differs between trait and cognitive associations. Rumination has been found to have many detrimental outcomes (Flett et al., 2016), with negative affect being one of them (Morrow & Nolen-Hoeksema, 1990). Studies show that ruminating can also increase endorsement of irrational beliefs (Szasz, 2011); further, excessive worry, which is conceptually similar to rumination, is related to increased fear of failure (Metzger et al., 1990). Thus, rumination does not only increase negative affect, but it can also contribute to exacerbating irrational beliefs about fear of failure. From these findings, it follows that perfectionism-specific ruminations, which already entail components of fear about making mistakes (e.g., "I should never make the same mistake twice"), would exacerbate FF.

In addition to perfectionistic cognitions, procrastinatory cognitions may also be relevant to FF. As FF predicts negative affect (Sagar & Stoeber, 2009), and negative affect promotes procrastination (Tice & Bratslavsky, 2000), the pathway from FF to procrastination may become cyclic. In turn, cognitive schemas that are associated with procrastination may, overtime, become activated in response to FF. As such, the following hypothesis is made regarding the mediating role of fear of failure:

> **Hypothesis 4.2**: *The magnitude of the indirect effect via fear of failure will be largest in the pathway between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association).*

1.3 Perfectionism, Procrastination, and Overgeneralization of Failure

Overgeneralization of failure (OGF) is a self-critical cognitive process that occurs when an individual who experiences a failure overgeneralizes this failure to his/her self-concept, leading to a reduced sense of self-worth (Carver & Ganellen, 1983). Even in the absence of perceived failures, awareness of personal flaws, even minor ones, can trigger an overgeneralization of failure response (e.g., "noticing one fault of mine makes me think more and more about other faults"). In terms of measurement, OGF exists within a broader scale of

self-critical cognitive processes, known as the Attitudes Toward Self (ATS) Scale, which has been primarily researched in the context of depressive symptomatology. Although Carver and Ganellen (1983) were first to develop a measure of OGF, the term was previously coined by Beck (1967) who identified OGF as one of many cognitive distortions, encompassing the tendency for depressed patients to generalize failures to their sense of self.

Although not widely researched outside of the depression literature, OGF has also been explored in the context of perfectionism. Flett, Goldstein, and colleagues (2012) discovered that OGF is positively related to components of perfectionism, notably those that fall under PC. This association is sensible: persistent concerns about making mistakes, failing to meet others' demands, and incurring negative judgements may lead the perfectionist to adopt an "all of nothing" thinking style (Flett et al., 2018). Perfect performance implies self-adequacy, but anything short of perfection is immediately perceived as sign of self-deficiency.

In contrast to the perfectionism literature, the tendency to overgeneralize failures has not been examined in relation to procrastination. Yet, studies have found that procrastination is correlated with constructs similar to OGF, such as self-efficacy and competence. Self-efficacy is the belief that one has the abilities required to successfully accomplish a goal (Bandura, 1977), and similarly competence refers to having the knowledge and skills required to perform a job well (Gale & Pol, 1975). Studies show that self-efficacy is negatively associated with procrastination (Martin et al.,1996) and low levels of perceived competence predict higher levels of procrastination (Haghbin et al., 2012), such that "procrastinating individuals tend to irrationally believe that they are inadequate or incapable" (p.250). The belief that one is "inadequate" is experienced by individuals who overgeneralize failures to their global sense of self (Carver & Ganellen, 1983). Yet, it should be noted that, unlike self-efficacy and competence, OGF is unique in that deflation of self-worth is conceived specifically in response to failure. Nonetheless, seeing that these constructs predict procrastination suggests that OGF would too. To add, the association between OGF and procrastination is supported by the emotion-regulation theory. As OGF predicts negative affect (Kernis et al., 1989) and negative affect triggers procrastination (Tice & Bratslavsky, 2000), then OGF can lead to procrastination.

Thus, another purpose of this study is to explore the relationships between perfectionism, procrastination and OGF, which, to the researcher's knowledge, has not been examined before. To add, this is also the first study to examine OGF's association with trait-procrastination, and

with cognitive measures of perfectionism and procrastination. As findings demonstrate that perfectionistic traits can lead to OGF and that OGF should theoretically predict procrastination, the following is hypothesized:

> **Hypothesis 5.1**: *Overgeneralization of failure will mediate all (cognitive, trait, and mixed) pathways between perfectionism and procrastination.*

Further, it is also of interest to examine if the mediating effect of OGF is stronger in some associations of perfectionism and procrastination compared to others. The literature shows that OGF is a form of cognitive distortion (Beck, 1967), that can entail negative thought patterns and self-defeating ruminations (Besharat & Shahidi, 2010). Thus, it follows that the cognitive components of perfectionism may be more pertinent and act as stronger triggers for OGF, compared to trait-like tendencies of perfectionism. Such a rationale can also be applied to procrastination; in fact, Stainton et al (2000) explained that "procrastinators may begin with ruminations about their dilatory behaviours, and overtime and in certain contexts, begin to generate overall doubts of self-worth and thoughts of self-condemnation". As such, it appears that the cognitive measures of perfectionism and procrastination are especially pertinent to OGF, leading to the following hypothesis:

> **Hypothesis 5.2:** *The magnitude of the indirect effect via overgeneralization of failure will be largest in the pathway between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association).*

1.4. Perfectionism, Procrastination, Fear of Failure, and Overgeneralisation of Failure

The literature review thus far has suggested that perfectionism may predict FF, which in turn may predict procrastination. There is also evidence to suggest that perfectionism predicts OGF, which in turn would also predict procrastination. Thus, it is expected that FF and OGF would, separately, mediate the association between perfectionism and procrastination. Further, there also exists evidence to suggest that a sequential mediation, via FF followed by OGF, is plausible. The individual who is persistently concerned with the negative consequences of failure may be highly attuned to any sign of failure (e.g., flaws, mistakes and shortcomings). Thus, for individuals high in FF, personal flaws and shortcomings may be very salient and threatening, such that noticing these flaws immediately leads to overgeneralizing. Indeed, Elliot (2005) observed that FF significantly predicted OGF. Further, Haghbin et al. (2012) found that low levels of perceived competence, a construct conceptually similar to OGF, predicted a stronger

association between fear of failure and procrastination; this suggests that OGF may have a role in the association between fear of failure and procrastination. As such, the final hypothesis of this study is:

> **Hypothesis 6:** *There will be a sequential mediation effect, via fear of failure followed by overgeneralization of failure, for all (trait, cognitive, and mixed) pathways between perfectionism and procrastination.*

1.5 Summary of Study Objectives

The literature on perfectionism and procrastination has demonstrated that these constructs are significantly correlated, yet mixed findings exist regarding the magnitude of this association. Further, previous findings were largely trait-driven, and not many studies have addressed the role of cognition in these associations. As such, the first objective of this study is to examine the relationship between perfectionism and procrastination using both trait and cognitive measures, and to clarify the magnitude of this association while also exploring the possibility that effect sizes of correlations can vary based on measures being used (e.g., trait versus cognitive measures).

The second objective of this study is to examine the potential mediating roles of FF and OGF in all pathways (cognitive, trait, and mixed) between perfectionism and procrastination. While research showed that FF is linked to both perfectionism and procrastination, the role of OGF in the perfectionism-procrastination association has been unexamined. Further, the literature provides support for the possibility that mediating effects, via OGF and FF, will be strongest between cognitive measures of perfectionism and procrastination; as such, this possibility will also be explored. Finally, as there exists evidence to support that FF can lead to OGF, the present study will explore the potential sequential mediation effect, of FF followed by OGF, for all pathways (cognitive, trait, and mixed) between perfectionism and procrastination.

CHAPTER 2: METHODS

2. Method

2.1 Participants

Participants were 327 undergraduate university students (73.4% female), recruited from an introductory psychology course at the University of Western Ontario, Canada. Participants' ages ranged from 18 to 27 years, with the average age being 18.86 (SD = 2.67). The ethnic composition of the sample was 45.9% White/European, 34.3% East Asian, 6.1% Middle Eastern, 4.0% South Asian, 2.8% Black, and 6.9 % other. Approximately 85.4% of participants in the sample self-identified as Canadians, and 70% of participants reported English as their first language.

2.2 Measures

2.2.1 Trait Perfectionism

Trait perfectionism was measured using the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990). The FMPS is a 35-item questionnaire that assesses a multitude of perfectionistic tendencies, yielding in six subscales that represent different factors of perfectionism: personal standards (PST; e.g., "it is important to me that I am thoroughly competent in everything I do"), concerns over mistakes (CM; e.g., "if I fail partly, it's as bad as being a complete failure"), doubts about actions (DA; e.g., "even when I do something very carefully, I often feel that it is not quite right"), parental expectations (PE; e.g., "my parents wanted me to be the best at everything"), parental criticism (PCR; e.g., "as a child I was punished for doing things less than perfect"), and organization (O; e.g., "neatness is very important to me"). Responses were recorded on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were summed across each subscale to produce six separate subscale scores, where higher scores indicated higher levels of perfectionism specific to that dimension. An aggregated total score for this scale was not generated.

The FMPS has good internal consistency and test-retest reliability; across multiple studies, alpha coefficients ranged from .74 to .96 for the six subscales (Frost et al., 1990; Rice & Mirzadeh, 2000). In a separate study of adolescents who completed the FMPS twice over a 4 - week period, test-retest reliability coefficients ranged from .70 to .85 across the six subscales (Gavino et al., 2019). The FMPS also demonstrated good convergent validity, yielding positive associations with others measures of perfectionism, including the Burns Perfectionism Scale

(Frost et al., 1990), and with measures of related constructs, such as the Intolerance to Uncertainty subscale of the Obsessive Belief Questionnaire (Gavino et al., 2019). The FMPS also demonstrated predictive validity; for instance, the CM and PCR subscales predicted anxiety symptoms and depressive symptoms (Gavino et al., 2019). Incremental validity was evidenced as the CM subscale predicted depressive symptomatology, above and beyond personality factors such as neuroticism (Rice et al., 2007).

Trait perfectionism was also measured using The Hewitt Flett Multidimensional Perfectionism Scale (HFMPS; Hewitt & Flett, 1991; 2004). This 45-item questionnaire assesses three trait-dimensions of perfectionism: self-oriented perfectionism (SOP; e.g., "one of my goals is to be perfect in everything I do"), socially prescribed perfectionism (SPP; e.g., "the people around me expect me to succeed at everything I do"), and others-oriented perfectionism (OOP; e.g., "if I ask someone to do something, I expect it to be done flawlessly"). Each subscale was comprised of 15 items, and responses were recorded on a 7-point Likert scale from 1 (*disagree*) to 7 (*agree*). Scores were summed and ranged from 15 to 105 for each subscale, with higher scores indicating higher levels of perfectionism specific to that subscale. An aggregated total score for this scale was not generated.

Satisfactory internal consistency and test-retest reliability for the HFMPS have been reported across multiple studies. In a student sample of 1106 students, alpha coefficients were: α = .89 (SOP), α = .79 (OOP), and α = .86 (SPP) (Hewitt and Flett, 1991). In a separate study, reliability coefficients were: r = .88 (SOP), r = .85 (OOP), and r = .75 (SPP) (Hewitt and Flett, 1991). Convergent validity for the SOP and SPP subscales was supported via positive associations with other measures of perfectionism, including the Burns Perfectionism Scale (Hewitt and Flett, 1991), and with related constructs, including self-criticism and parental pressure (Hill et al., 2004). The subscale assessing OOP showed negative correlations with items measuring perfectionism oriented toward the self (SPP, SOP), supporting discriminant validity (Cockell et al., 2002).

2.2.1.1 Perfectionistic Strivings and Perfectionistic Concerns

The FMPS and HFMPS can be combined into one model, with two overarching factors: perfectionistic strivings (PS) and perfectionistic concerns (PC) (Frost et al., 1993, Bieling et al., 2004). In this study, these superordinate dimensions were used to measure trait-perfectionism. PS was an aggregated score, made up of scores from two subordinate dimensions: personal

standards of the FMPS and self-oriented perfectionism of the HFMPS. PC was also an aggregate score, made up of scores from three subordinate dimensions: concern over mistakes and doubts about actions of the FMPS, and socially prescribed perfectionism of the HFMPS. Some dimensions of the HFMPS and FMPS were not included in the aggregate scores because they did not fit the 2-factor model well (see Stoeber, 2018).

2.2.2 Perfectionistic Cognitions

Perfectionistic cognitions were measured using the Perfectionism Cognitions Inventory (PerfCI; Flett et al., 1998). The 25-item questionnaire provides a measure of reoccurring perfectionistic thoughts that become activated when a person perceives a discrepancy between his/her actual self and ideal self. This perceived discrepancy triggers automatic thoughts, such as "no matter how much I do, it's never enough" and "I can always do better, even if things are almost perfect". The PerfCI assesses how frequently individuals experience perfectionistic thoughts, using a 5-point Likert scale from 0 (*not at all*) to 4 (*all the time*). The total score was computed by taking the sum of all items in the questionnaire, yielding a score ranging between 0 - 100, where higher scores were indicative of frequent thoughts about the need to be perfect.

The PerfCI has demonstrated excellent internal consistency across clinical and non-clinical samples, with Cronbach's alphas of .91 (Flett, Stainton, et al., 2012) and .95 (Flett at al., 2007), respectively. Good test-retest reliabilities, of .67 and .85, were reported for a student and clinical samples, respectively (Flett et al., 1998). Previous studies also found good convergent validity: the PerfCI positively correlated with other measures of perfectionism, including the self-oriented and socially prescribed perfectionism subscales of the HFMPS. PerfCI was reported to predict depression, above and beyond trait measures of perfectionism (Flett et al., 1998), providing support for its predictive validity.

2.2.3 Trait Procrastination

Trait procrastination was measured using the General Procrastination Scale (GPS; Lay, 1986). Lay's 20-item questionnaire assesses individuals' tendencies to procrastinate, with items such as "I often find myself performing tasks that I had intended to do days before" and "I generally delay before starting on work I have to do". Respondents rated the extent to which they identified with such tendencies, using a 5-point Likert scale from 1 (*extremely uncharacteristic*) to 5 (*characteristic*). The total score was the sum of all items in the questionnaire and ranged from 20 - 100, with higher scores indicating higher levels of procrastination. The GPS has

demonstrated good internal consistency with an alpha coefficient of .82 (Lay, 1986), as well as good test-retest reliability with a reliability coefficient of .80 (Ferrari, 1989). The scale also demonstrated good convergent validity; in a sample of 4169 participants, the GPS yielded positive associations (ranging from .70 to .87) with five other scales of perfectionism, including the Decisional Procrastination Scale (DPS), Irrational Procrastination Scale (IPS), Pure Procrastination Scale (PPS), and the Adult Inventory of Procrastination Scale (AIP) (Svartdal & Steel, 2017).

2.2.4 Procrastinatory Cognitions

Procrastinatory cognitions were measured using the Procrastinatory Cognitions Inventory (ProcCI; Stainton et al., 2000). The 18-item questionnaire provides a measure of procrastinatory thoughts that can become activated in response to delaying starting or completing important tasks. When an individual engages in the delay, this behaviour may trigger automatic thoughts, such as "no matter how much I try, I still put things off" and "it would be great if everything in my life were done on time". The ProcCI assesses the frequency of procrastinatory cognitions on a 5-point Likert scale from 0 (*not at all*) to 4 (*all the time*). The total score was computed by summing all items, yielding in a score between 0 - 100, with higher scores indicating more frequent automatic thoughts about one's procrastinatory behaviours.

The ProcCI has shown excellent internal consistency ($\alpha = .93$) (Flett et al., 2012), and good test-retest reliability ($r = .76$) (Stainton et al., 2000). The ProcCI is positively correlated with other measures of perfectionism, such as the General Procrastination Scale ($r = .69$) (Stainton et al., 2000), as well as with measures of related constructs, including negative automatic thoughts ($r = .70$) and agitation ($r = .54$) (Flett at al., 2012), providing support for convergent validity. Further, the ProcCI demonstrated predictive validity, for measures of distress, depression, and general anxiety (Flett at al., 2012). Incremental validity was also evidenced as the ProcCI predicted psychological distress after controlling for other personality traits, such as neuroticism and conscientiousness (Flett et al., 2012).

2.2.5 Fear of Failure

Fear of Failure (FF) was measured using the Performance Failure Appraisal Inventory (PFAI-Revised; Conroy et al., 2002). This 25-item questionnaire is comprised of 5 subscales, corresponding to 5 domains that underlie fear of failure: fear of experiencing shame and embarrassment (e.g., "when I am failing, I worry about what others think about me"), fear of

devaluing one's self-estimate (e.g., "when I am failing, it is often because I am not smart enough to perform successfully"), fear of having an uncertain future (e.g., "When I am failing, I believe that my future plans will change"), fear of important others losing interest (e.g., "when I am not succeeding, people are less interested in me"), and fear of upsetting important others (e.g., "when I am failing, it upsets important others"). Respondents indicated to what extent each item resonated with them, using a 5-point Likert scale from -2 (*Do Not Believe At all*) to 2 (*Believe 100% of the Time*). Subscale scores were comprised of average scores for corresponding items; the total score, which represents a measure for general fear of failure (FF), was obtained by taking the average of all subscale scores. In this study, only the score for general fear of failure was reported.

The PFAI has demonstrated adequate internal consistency with alpha coefficients ranging from .74 to .81 across the five subscales, and .82 for the total score (Conroy et al., 2002). The PFAI had also demonstrated convergent validity, as FF scores for this scale positively correlated with measures of related constructs, including the worry subscale of the sport anxiety scale (SAS). FF scores negatively correlated with optimism and did not correlate with fear of success, providing support for the discriminant validity of this scale (Conroy et al., 2002).

2.2.6 Overgeneralization of Failure

Overgeneralization of failure (OGF) was measured using the overgeneralization of failure subscale, from the Attitudes Towards Self Scale (ATS; Carver and Ganellen, 1983). The 18-item questionnaire assesses three areas of self-regulatory cognitions, including high standards, self-criticism, and overgeneralization of failure. High standards encompasses the tendency to impose high expectations on the self ("I expect a lot of myself"), self-criticism refers to the tendency to be overly critical of one's own behaviours, actions, and performance ("I am not satisfied with anything less than I expected of myself"), and OGF refers to the tendency to generalize failures to one's global sense of self-worth ("when even one thing goes wrong I begin to wonder if I can do well at anything at all"). OGF is the only subscale of the ATS that was administered in the current study. This subscale was comprised of 7 statements, and respondents were asked to rate their agreement with each statement using a 5-point Likert scale from 1 (*extremely untrue*) to 5 (*extremely true*).

The OGF subscale of the ATS has demonstrated good internal consistency, with an alpha coefficient of .82 (Carver and Ganellen, 1983). This subscale also demonstrated predictive

validity; in the initial validation study, findings indicated that ATS predicted depressive scores, as measured by the BDI, and OGF accounted for the strongest predictor in these regression analyses (Carver and Ganellen, 1983).

2.3 Procedure

The current study was approved by Western University's Research Ethics Board (Project ID: 114248). Recruitment was conducted using Western's Psychology Research Participation Pool (SONA) – an online platform for undergraduate students to sign up for studies. After signing up for the study, participants received a letter of information outlining the purpose, procedures, and other relevant details of the study. Importantly, participants were informed that their participation is voluntary, and that they could withdraw from the study at any time without penalty. After providing consent, participants were invited to complete a battery of questionnaires via Qualtrics. The duration of the survey was approximately 60 minutes, and comprised of a demographic questionnaire, followed by the questionnaires described above on perfectionism, procrastination, fear of failure, and overgeneralization of failure. Upon completion, participants were redirected to another window containing the debriefing letter, which explained the purpose of the study with greater detail, the hypothesized results, and provided a list of relevant references. Incomplete data obtained from participants who withdrew from the study (i.e., exited browser before completion) were discarded. Regarding compensation, participants who signed up for the study as part of their introductory psychology course requirements received compensation in terms of research credits. There was no monetary compensation for participation in this study.

CHAPTER 3: RESULTS

3. Results

3.1 Data Screening

  In advance of conducting standard data screening protocols, the data were assessed for the duration that it took participants to complete the survey, and for participants' responses to attention-check questions. It was deemed that a minimum of 14 minutes were required to complete the survey in a feasible and reliable manner. This decision was based on the number of measures in the study, consultation with other researchers, and preliminary testing of the survey by the principal investigator, which took 19 minutes. The cut-off of 14 minutes was based on the possibility that individual differences in the speed of reading and optimality of the testing environment could yield shorter completion times, of up to 5 minutes. As such, participants who completed the survey in 13 minutes or less were removed from the data set. From the initial sample of 357 participants, 18 participants were removed for not meeting the time-for-completion requirement.

  Additionally, 6 attention-check questions were randomly placed throughout the survey; researchers recommend the use of attention-checks to assess for careless responding (Schmitt & Stults, 1985). Further, recent research has shown that attention-check questions do not pose a threat to the validity of a scale (Kung et al., 2018). Thus, participants who incorrectly answered 1 or more of these questions were removed from the data set; 12 participants were removed, yielding a total of 327 participants.

  Standard data screening procedures were employed thereafter, using the IBM SPSS software, version 21. An analysis of the dataset indicated that 1.35% of values were missing. Schafer (1999) notes that when missing values account for 5% or less of the dataset, they do not pose problems; thus, missing values were not removed, and imputations for missing data were not used. To account for missing cases without compromising the sample size, pairwise deletion was implemented in the analyses. Multivariate normality was assessed for all 7 variables of interest: trait-perfectionism (perfectionistic strivings and perfectionistic concerns), perfectionistic cognitions, trait-procrastination, procrastinatory cognitions, fear of failure, and overgeneralization of failure. For these variables, skewness and kurtosis values were examined, as indices of multivariate normality (see Table 1). According to DeCarlo (1997), a normal distribution for any given variable is characterized by skew index (SI) values that do not exceed

|3.00| and kurtosis index (KI) values that do not exceed |10.00|. As seen in Table 1, SI and KI values for the study variables did not exceed the recommend cut-off values and, as such, all variables in the study were deemed to be normally distributed.

An assessment for multivariate outlines was conducted using the Mahalanobis distance (D^2) metric, which measures the distance between a given datapoint and a central (mean) point in a normal distribution. In this way, D^2 detects extreme values that fall in the far ends of the distribution. Outliers are cases that fall within the significance level of $p < .001$ (Kline, 2011). Using this procedure, no outliers were detected for the variables of interest. Multicollinearity, which refers to the presence of unusually high correlations between predictor variables in the study, was also assessed to ensure that predictor variables were in fact measuring relatively distinct constructs. Collinearity is assessed using the variance inflation factor (VIF) and the tolerance statistic; VIF values that are > 10.0 and tolerance values that are < .01 are indicative of a high multicollinearity (Kline, 2011). For all predictor variables in this study, VIF values were $\leq$ 2.96 and tolerance values were $\geq$ .34, indicating that this dataset did not have problematic levels of multicollinearity.

3.2 Preliminary Analyses

Means, standard deviations, and Cronbach's alpha coefficients for all variables in this study are presented in Table 1. Cronbach's alpha coefficients ranged from good to excellent, .88 $\leq \alpha \geq$ .93, for all variables in the study. Bivariate correlations between all variables are presented in Table 2. Correlations between all measures of perfectionism and procrastination were statistically significant, except for the correlation between perfectionistic strivings and trait procrastination, $p > .05$. Regarding fear of failure and overgeneralization of failure: these variables significantly and positively correlated with all trait and cognitive measures of perfectionism and procrastination, $p < .001$

A preliminary observation of the mean scores for the procrastination and perfectionism variables revealed that females scored higher than males for all measures corresponding to these two variables (see Table 3). Thus, a series of independent samples t-tests were conducted to examine if these differences were statistically significant, and if they aligned with the differences found in previous studies. Significant differences between males and females were found for one measure of perfectionism: perfectionistic cognitions, $t(318) = -2.04$, $p < .05$, indicating that females reported significantly higher frequencies of automatic perfectionistic thoughts ($M =$

80.75, $SD = 17.03$), compared to males ($M = 76.45$, $SD = 15.90$). Significant differences were also found for the measure of overgeneralization of failure, $t(321) = -1.98$, $p < .05$, indicating that females reported significantly greater tendencies to overgeneralize failures to their global self-concepts ($M = 24.54$, $SD = 6.16$), compared to males ($M = 23.00$, $SD = 6.34$).

3.3 Correlation Analyses

As hypothesized, perfectionistic cognitions positively and significantly correlated with both trait procrastination ($r = .12$, $p < .05$) and cognitive procrastination ($r = .47$, $p < .001$). The trait-dimension of perfectionistic concerns also yielded positive and significant correlations with both trait procrastination ($r = .21$, $p < .001$) and cognitive procrastination ($r = .48$, $p < .001$). These results suggest that there is a varying but significant relationship between perfectionism and procrastination (when measured from both trait and cognitive perspectives). In contrast, the trait-dimension of perfectionistic strivings did not yield a significant correlation with trait procrastination ($r = -.04$, $p > .05$) and, contrary to what was expected, perfectionistic strivings yielded a small but significant positive association with cognitive procrastination ($r = .14$, $p < .05$). These results suggest that, contrary to the hypothesis, those with perfectionistic strivings are not less likely to have procrastinatory tendencies or less likely to experience procrastinatory cognitions.

3.3.1 Comparison of Effect Sizes

According to Cohen (1992, 1998), the magnitude of Pearson's correlations can be interpreted in terms of effect sizes. The effect size is considered: small when $r = .10$, medium when $r = .30$, and large when $r = .50$. Both perfectionistic concerns (trait measure) and perfectionistic cognitions (cognitive measure) yielded medium-to-large effect sizes ($r = .49$ and $r = .47$, respectively) with procrastinatory cognitions (cognitive measure). Thus, the hypothesis that the association between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association) would have the largest effect size was partially supported, but the large effect size between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association) was not anticipated. Importantly, the effect sizes for the trait-cognitive associations were not consistent; while a large effect size was found between perfectionistic concerns and procrastinatory cognitions, a small effect size ($r = .14$) was observed in the association between perfectionistic strivings and procrastinatory cognitions (trait/str-cognitive association).

The effect size in the association between perfectionistic cognitions and trait

procrastination (cognitive-trait association) was small ($r = .12$). This contrasts the large effect size observed for the association between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association), providing support to the hypothesis that the cognitive-trait association would be weaker than the cognitive-cognitive association. The association between perfectionistic concerns and trait-procrastination (trait-trait association) was of small-to-medium effect size, $r = .23$. Once again, this contrasts the large effect size observed between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association), providing support for the hypothesis that the trait-trait association would be weaker than the trait-cognitive association. The association between perfectionistic strivings and trait-procrastination (trait/str-trait association) was close to zero ($r = -.038$); as hypothesized, this correlation was weaker than that observed between perfectionistic strivings and procrastinatory cognitions (trait/str-cognitive association).

Contrary to what was hypothesized, associations consisting of perfectionistic cognitions did not always produce the greatest effect sizes with procrastination. As mentioned above, the cognitive-cognitive association ($r = .47$) was of comparable, not larger, effect size to the trait-cognitive association ($r = .49$); further, the cognitive-trait association ($r = .12$) was of smaller effect size than the trait-cognitive association ($r = .49$), and also smaller than the trait-trait association ($r = .23$).

3.4 Hierarchical Regression Analysis

Hierarchical regressions predicting procrastinatory cognitions from trait and cognitive measures of perfectionism were conducted to examine the incremental validity of the PerfCI (the cognitive measure of perfectionism), and to assess if perfectionistic cognitions predict further variance in procrastinatory cognitions, beyond the variance attributable to trait-perfectionism. To conduct this regression analysis, the superordinate trait-dimensions of perfectionistic striving and perfectionistic concerns were first entered as predictors in block 1; next, perfectionistic cognitions were entered as a separate predictor in block 2. The results are presented in Table 4. The trait block accounted for 25.5% of the variance in procrastinatory cognitions scores ($F = 52.6, p < .001$) and adding perfectionistic cognitions into the model revealed that perfectionistic cognitions accounted for an additional 12.8% of the variance in procrastinatory cognitions scores ($F = 63.8, p < .001$).

3.5 Mediation Analyses

Mediation analyses were conducted to examine the potential role of fear of failure (FF) and overgeneralization of failure (OGF) in mediating the relationship between perfectionism and procrastination. Mediation was examined in the relationship between the predictor variables of perfectionistic strivings, perfectionistic concerns, and perfectionistic cognitions, and the outcome variables of procrastinatory cognitions and trait-procrastination. The mediating variables of FF and OGF were tested independently and sequentially. Mediation was conducted in Mplus Version 7.4 (Muthén & Muthén, 1998–2012), using bias-corrected bootstrapping to run 1000 bootstrap replications. The hypotheses that both FF and OGF would mediate the relationship between perfectionism and procrastination was assessed by examining the statistical significance of the indirect effects in the mediation models. The statistical significance of the standardized regression coefficients for these indirect effects was assessed using the 95% bias-correlated bootstrapped confidence intervals; mediation occurs when the confidence interval for the indirect effect is completely above or below zero (Hayes & Rockwood, 2017).

The statistical significance of the direct effects was also examined, as it may provide further insight about the nature of the mediation. When the direct and indirect effects are both significant, this suggests that the association between the predictor and outcome variables is not entirely attributable to the presence of the mediator, suggesting that there exists a partial mediation (Baron & Kenny, 1986). In contrast, when an indirect effect is significant, but the direct effect is not, it suggests that the association between the predictor and outcome variables is entirely attributable to the mediator, providing support for a complete mediation (Baron & Kenny, 1986).

3.5.1 Fear of Failure

The mediating role of fear of failure (FF) was examined using two mediation models, with the perfectionistic traits (PS and PC) as predictors in one model (see Table 5 and Figure 1), and perfectionistic cognitions as predictors in another model (see Table 6 and Figure 2); both models contained FF as the mediating variable, and trait-procrastination and procrastinatory cognitions as the outcomes variables. As hypothesized, statistically significant indirect effects were observed between all associations of perfectionism and procrastination, indicating that FF significantly mediated all existing perfectionism-procrastination pathways.

For the trait-perfectionism model (Table 5 and Figure 1), there was a significant and negative total effect between perfectionistic strivings and trait-procrastination (trait/str-trait

association) via FF (β = -.227, *p* < .001, 95% CI [-.376, -.065]). For this association, the indirect effect via FF was also significant (β = -.040, *p* < .035, 95% CI [-.106, -.002]). These results suggest that FF mediated the association between perfectionistic strivings and trait-procrastination. A significant and negative total effect was also observed between perfectionistic strivings and procrastinatory cognitions (trait/str-cognitive association) via FF (β = -.160, *p* = .006, 95% CI [-.327, -.010]). For this association, the indirect effect via FF was also significant (β = -.045, *p* = .020, 95% CI [-.111, -.009]). These results indicate the FF mediated the association between perfectionistic strivings and procrastinatory cognitions.

The direct effect was significant between perfectionistic strivings and trait procrastination (β = -.187, *p* = .004, 95% CI [-.344, -.028]), but non-significant between perfectionistic strivings and procrastinatory cognitions (β = -.115, *p* = .050, 95% CI [-.266, .043]). These results suggest that FF partially mediated the relationship between perfectionistic strivings and trait procrastination (trait/str-trait association), but fully mediated the relationship between perfectionistic strivings and procrastinatory cognitions (trait/str-cognitive association).

A significant and positive total effect was obtained in the pathway between perfectionistic concerns and trait-procrastination (trait-trait association), β = .353, *p* < .001, 95% CI [.179, .510]. For this pathway, the indirect effect via FF was also significant, β = .162, *p* = .017, 95% CI [.007, .351]. The standardized regression coefficient for the direct effect in this trait-trait association was not significant (β = .191, *p* = .058, 95% CI [-.065, .429]), indicating that FF fully mediated the association between perfectionistic concerns and trait-procrastination. A significant and positive total effect was also observed in the pathway between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association), β = .573, *p* < .001, 95% CI [.429, .685]. For this pathway, the indirect effect via FF was significant (β = .183, *p* = .004, 95% CI [.033, .347]), and the direct effect was also significant (β = .390, *p* < .001, 95% CI [.198, .612]). These results indicate that FF partially mediated the relationship between perfectionistic concerns and procrastinatory cognitions. Cumulatively, the results for the trait-perfectionism model showed that FF mediated the association between both dimensions of trait-perfectionism and procrastination (both cognitive and trait measures of procrastination).

For the cognitive-perfectionism model (Table 6 and Figure 2), the indirect effect via FF for the pathway between perfectionistic cognitions and trait-procrastination (cognitive-trait association) was positive and significant (β = .129, *p* < .001, 95% CI [.059, .217]). The direct

effect for this pathway was negative and non-significant (β = - .008, *p* < .889, 95% CI [- .154, - .149]). These results indicate that the association between perfectionistic cognitions and trait-procrastination (cognitive-trait association) was fully mediated by FF. The total effect for this cognitive-trait pathway was not significant; in this case, as indirect and direct effects were of opposite signs, a non-significant total effect may have occurred as a result of suppression (Hayes and Rockwood, 2017). A significant and positive total effect was also obtained between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association). For this pathway, the indirect effect via FF was positive and significant (β = .144, *p* < .001, 95% CI [.070, .221]), and the direct effect was also significant (β = .326, *p* < .001, 95% CI [.183, .452]. These results indicate that FF partially mediated the association between perfectionistic cognitions and procrastinatory cognitions.

3.5.2 Overgeneralization of failure

The mediating role of overgeneralization of failure (OGF) was examined using two mediation models, with perfectionistic traits (PS and PC) as predictors in one model (see Table 7 and Figure 3) and perfectionistic cognitions as predictors in another model (See Table 8 and Figure 4); both models contained OGF as the mediating variable, and trait-procrastination and procrastinatory cognitions as the outcome variables.

For the trait-perfectionism model (Table 7 and Figure 3), a non-significant indirect effect was observed in the pathway between perfectionistic strivings and trait-procrastination (trait/str-trait association), via OGF *(β = .020, p = .228, 95% CI [-.028, .078])*; this was also the case for the indirect effect in the pathway between perfectionistic strivings and procrastinatory cognitions (trait/str-cognitive association), via OGF *(β = .017, p = .275, 95% CI [-.023, .065])*. Contrary to what was hypothesized, these results suggest that OGF did not mediate the association between perfectionistic strivings and procrastination (for both trait and cognitive measures of procrastination).

A significant and positive total effect was observed in the pathway between perfectionistic concerns and trait-procrastination (trait-trait association), via OGF (β = .353, *p* < .001, 95% CI [.179, .509]). For this pathway, the standardized regression coefficient for the indirect effect was significant (β = .147, *p* < .001, 95% CI [.064, .275]), but non-significant for the direct effect (β = .206, *p* = .007, 95% CI [- .007, .377]). Such results indicate that OGF fully mediated the association between perfectionistic concerns and trait-procrastination. For the

pathway between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association), the total effect was significant (β = .573, p < .001, 95% CI [.436, .687]), and the indirect effect via OGF was significant (β = .126, p < .001, 95% CI [.048, .223]). For this trait-cognitive pathway, the direct effect was also significant (β = .447, p < .001, 95% CI [.266, .581]), indicating that FF partially mediated the relationship between perfectionistic concerns and procrastinatory cognitions.

For the cognitive-perfectionism model (Table 8 and Figure 4), a significant and positive indirect effect was observed between perfectionistic cognitions and trait procrastination (cognitive-trait association), via OGF (β = .182, p < .001, 95% CI [.077, .275]) whereas the direct effect for this pathway was negative and non-significant (β = - .062, p = .271, 95% CI [-.204, .079]). These results indicate that OGF fully mediated the association between perfectionistic cognitions and trait procrastination. The total effect for the cognitive-trait pathway was not significant (β = .120, p = .030, 95% CI [- .021, .248]); this may be evidence for suppression, as indirect and direct effects in the pathway were of opposite signs (Hayes and Rockwood, 2017). A significant and positive indirect effect was also observed between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association), via OGF (β = .130, p < .001, 95% CI [.043, .222]). The total effect between perfectionistic cognitions and procrastinatory cognitions was positive and significant (β = .470, p < .001, 95% CI [.347, .578]). In this case, the direct effect was also significant (β = .340, p < .001, 95% CI [.201, .476]), providing support for partial mediation. These results indicate that OGF partially mediated the association between perfectionistic cognitions and procrastinatory cognitions.

3.5.3 Comparison of Indirect Effect

Mediation models employed for this analysis were identical to models in the preceding analyses; FF and OGF were tested separately, and trait perfectionism and cognitive perfectionism predictors were also tested separately, yielding a total of four models. To test the hypotheses that FF and OGF would have the strongest mediating (indirect) effects in the pathway between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association), indirect effects were compared between different pathways of perfectionism and procrastination; thus, for each mediator, indirect effects were compared across two models (cognitive and trait models of perfectionism).

In addition, within each single model, differences between indirect effects were

compared, in order to examine if statistically significant differences might be present. For these comparisons, all variables were standardized (raw scores were converted into z-scores), such that comparisons can be made across different variables. The new parameter, corresponding to the difference between two regression coefficients of indirect effects, was assessed using the 95% bias-correlated bootstrapped confidence intervals; if the interval does not contain zero, it suggests that the difference between the indirect effects being tested is statistically significant (Hayes and Rockwood, 2017)

For models with FF as the mediator (see Table 5 and Table 6), the largest indirect effect was obtained for the association between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association), which does not support the hypothesis that FF will have the strongest mediating effect in the association between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association). In both models pertaining to this analysis, indirect effects were consistently larger when procrastination was assessed from a cognitive perspective rather than a trait perspective. Thus, differences between these indirect effects were tested for statistical differences, separately for each model. The indirect effects for the first model were compared across the following pathways: (1) perfectionistic strivings and trait-procrastination compared with perfectionistic strivings and procrastinatory cognitions, and (2) perfectionistic concerns and trait-procrastination compared with perfectionistic concerns and procrastinatory cognitions (see Table 9). The indirect effects in the second model were compared across the following pathways: (1) perfectionistic cognitions and trait-procrastination compared with perfectionistic cognitions and procrastinatory cognitions (see Table 10). Tests of significance revealed that none of these differences were statistically significant (see Table 9 and Table 10), indicating that the magnitude of the indirect effects for FF were not statically larger in pathways consisting of procrastinatory cognitions compared to those consisting of trait procrastination.

For models with OGF as the mediator (see Table 7 and Table 8), the largest indirect effect was obtained for the association between perfectionistic cognitions and trait-procrastination (cognitive-trait association), which does not support the hypothesis that OGF will have the strongest mediating effect in the association between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association). In both models pertaining to this analysis, indirect effects were consistently larger when procrastination was assessed from a trait

perspective rather than a cognitive perspective. Thus, differences between these indirect effects were tested for statistical differences, separately for each model. The indirect effects for the first model were compared across the following pathways: (1) perfectionistic concerns and trait-procrastination compared with perfectionistic concerns and procrastinatory cognitions (see Table 11). As mediation analyses in the preceding section revealed that OGF did not mediate pathways with perfectionistic strivings, these pathways were not included in this analysis. The indirect effects in the second model were compared across the following pathways: (1) perfectionistic cognitions and trait-procrastination compared with perfectionistic cognitions and procrastinatory cognitions (see Table 12). Tests of significance revealed that none of these differences were statistically significant (see Table 11 and Table 12), indicating that the magnitude of the indirect effects for OGF were not statically larger in pathways consisting of trait procrastination, compared to those consisting of procrastinatory cognitions.

3.5.4 Sequential Mediation

The hypothesis that FF followed by OGF would sequentially mediate the relationship between perfectionism and procrastination was assessed by testing both mediators in a sequential pathway, as part of a single model. Two models were employed, with perfectionistic traits as predictors in one model (see Table 13 and Figure 5) and procrastinatory cognitions as predictors in another model (see Table 14 and Figure 6). In each model, three sets of indirect effects were produced: indirect effects via FF alone, indirect effects via OGF alone, and indirect effects via FF followed by OGF. The focus of this analysis was on the indirect effects produced in in the sequential pathway of FF followed by OGF.

For the trait perfectionism model (Table 13 and Figure 5), the indirect effect in the pathway between perfectionistic strivings and trait-procrastination (trait/str-trait association), via FF and OGF, was significant (β = -.022, p = .010, 95% CI [-.053, -.006]). The indirect effect in the pathway between perfectionistic strivings and procrastinatory cognitions (trait/str-cognitive association), via FF and OGF, was also significant (β = -.017, p = .011, 95% CI [-.040, -.004]). Such results indicate that associations between perfectionistic strivings procrastination (both trait and cognitive measures of procrastination) were mediated sequentially by FF followed by OGF.

The indirect effect in the pathway between perfectionistic concerns and trait-procrastination (trait-trait association), via FF and OGF, was significant (β = .090, p = .001, 95% CI [.031, .168]). For the pathway between perfectionistic concerns and procrastinatory

cognitions (trait-cognitive association), the indirect effect was also significant ($\beta = .070$, $p = .002$, 95% CI [.020, .131]). These results indicate that associations between perfectionistic concerns and procrastination (both trait and cognitive measures of procrastination) were mediated sequentially by FF followed by OGF. Together, these results suggest that when perfectionism is measured from a trait perspective, its association with procrastination is mediated by the sequential effects of FF and OGF.

For the cognitive perfectionism model (Table 14 and Figure 6), the indirect effect in the pathway between perfectionistic cognitions and trait-procrastination (cognitive-trait association), via FF and OGF, was significant ($\beta = .048$, $p = .003$, 95% CI [.007, .090]). In contrast, the indirect effect between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association) was not significant ($\beta = .018$, $p = .148$, 95% CI [-.015, .052]). These results indicate that the association between perfectionistic cognitions and trait-procrastination was mediated by the sequential effects of FF and OGF, but the association between perfectionistic cognitions and procrastinatory cognitions was not.

CHAPTER 4: DISCUSSION

4. Discussion

The purpose of this study was to address two questions: (1) what is the nature of the relationship between perfectionism and procrastination, when assessed using both trait and cognitive measures, and (2) are these associations mediated by fear of failure (FF) and overgeneralization of failure (OGF), independently and sequentially. Previous studies have examined associations between trait perfectionism and trait procrastination (see Sirois et al., 2017), as well as associations between perfectionistic cognitions and procrastinatory cognitions (Flett, Stainton, et al., 2012). However, associations between trait-perfectionism and procrastinatory cognitions (trait-cognitive association) and between perfectionistic cognitions and trait procrastination (cognitive-trait association) have been unexamined. This was the first study to examine both the trait and cognitive measures of perfectionism and procrastination, and to assess the mediating roles of FF and OGF in these associations.

4.1 Correlation Analyses: Findings and Future Directions

The first objective of this study was to investigate whether a relationship exists between trait and cognitive measures of perfectionism and procrastination. Perfectionistic cognitions were significantly and positively associated with both trait-procrastination and procrastinatory cognitions. Thus, individuals who experience reoccurring thoughts about the need to be perfect are also more likely to procrastinate, and to experience reoccurring negative thoughts about their procrastinatory behaviours, as suggested by previous findings (Flett, Stainton, et al., 2012). The trait dimension of perfectionistic concerns also significantly and positively correlated with trait-procrastination and procrastinatory cognitions. Individuals who are overly concerned about making mistakes, preoccupied with how others perceive them, and full of self-doubts are not only more likely to have procrastinatory tendencies (Flett et al., 1992; Smith et al., 2016; Sherry et al., 2016), but are also more like to experience negative automatic thoughts about their procrastinatory tendencies.

These findings may be viewed from the perspective of emotion-regulation failure (Tice & Bratslavsky, 2000; Tice et al., 2001). In response to aversive and worth-challenging tasks, both perfectionists and procrastinators engage in the maladaptive coping strategy of avoidance (Sirois & Kitner, 2015; McGregor & Elliot, 2002). For the perfectionist, thoughts about the need to complete a task flawlessly or preoccupation with others' evaluations can trigger a host of

negative emotions (Flett et al., 1998; Dunkley et al., 2012). In order to reconcile the negative emotions associated with the task, the perfectionist is compelled to avoid the task, leading to procrastination (Dunkley et al., 2003). Thus, the association between perfectionism and procrastination can be attributed to a mood-regulation failure; being unable to cope with the negative affect elicited by the task at hand, the perfectionist abandons the task or delays taking necessary action, rather synchronously to the term "out of sight, out of mind". Yet, not completely "out of mind", as, on the cognitive level, the perfectionist is very much burdened by thoughts about this delay (Flett, Stainton, et al., 2012). Future research will be necessary to ascertain casual links between perfectionism and procrastination and to examine the role of affect corresponding to the theory of emotion-regulation.

While both perfectionistic cognitions and perfectionistic concerns are positively associated with procrastination, the literature shows that perfectionistic strivings tend to relate negatively to procrastination (e.g., Smith et al., 2017). The results in this study, however, do not support this claim. Although a negative association was found between perfectionistic strivings and trait-procrastination, Pearson's *r* essentially approached zero, and was not statistically significant using an a priori *p* < .05. Further, a significant and positive correlation was found between perfectionistic strivings and procrastinatory cognitions. Thus, having high personal standards and striving for flawlessness does not significantly reduce one's propensity toward perfectionistic tendencies; in fact, findings in this study provide evidence that unrealistic high standards imposed on the self are related to deliberating and negative thoughts about inaction.

Although the positive correlation between perfectionistic strivings and procrastinatory cognitions was unanticipated, this result provides insight on the cognitive components of procrastination and on the unique nature of the trait-dimension of perfectionistic strivings (PS). That PS did not significantly correlate with trait-procrastination but yielded positive and significant correlations with procrastinatory cognitions may suggest that, although sometimes framed as the "adaptive" side of perfectionism (e.g., Rice & Preusser, 2002), PS can confer at least some vulnerability to procrastination, in the form of self-defeating ruminations. Further, this form of distress may be unique, as it is not captured by procrastinatory tendencies, but rather reflected in the cognitive expression of procrastination. Perhaps the rumination triggered by the avoidance of important tasks which is reflected in the ProcCI, is supressed when procrastination is measured from a trait perspective; indeed, Flett and colleagues (2016) found that brooding

rumination is strongly associated with procrastinatory cognitions. Future research should examine if rumination has a mediating role in the association between perfectionistic strivings and procrastinatory cognitions.

A related objective in this study was to compare the magnitudes of the correlations between perfectionism and procrastination, when these constructs were examined from both trait and cognitive perspectives. Published findings of the magnitude of the correlation between perfectionism and procrastination are inconsistent, with some yielding small-to-medium effects between perfectionism and procrastination (e.g., Sirois et al., 2017), and others yielding large effects (Flett, Stainton, et al., 2012). In this study, it was hypothesized that the relationship between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association) would yield the largest effect size. However, the findings in this study only partially supported this hypothesis; both the cognitive and trait measures of perfectionism (perfectionistic cognitions and perfectionistic concerns) correlated with procrastinatory cognitions at comparable, medium-to-large, effect sizes. Thus, findings from this study are partially aligned with those of Flett, Stainton and colleagues (2012), who found a large effect size in the association between perfectionistic cognitions and procrastinatory cognitions.

It was also hypothesized that procrastination, assessed from a trait perspective, would show a larger association with perfectionistic cognitions than with perfectionistic concerns. This, hypothesis was not supported. The cognitive-trait association ($r = .12$) was of smaller effect size than the trait-trait association ($r = .23$), although both relationships were not especially large. One explanation for this finding is that perfectionistic cognitions are not entirely different from the trait-dimension of perfectionistic concerns. While the former is a measure of automatic negative thoughts and the latter is a measure of trait-like tendencies, they may have shared components. In fact, Flett et al. (1998) found that perfectionistic cognitions strongly correlated with socially prescribed perfectionism ($r = .67$) and concern over mistakes ($r = .64$), which are dimensions underlying perfectionistic concerns. A strong association between perfectionistic cognitions and perfectionistic concerns ($r = .63$) was also found in this study. As both measures intend to capture personality aspects relevant to perfectionism, it should not come as surprise that a conceptual overlap may exist between them. Yet, this interpretation should be considered with caution, as it is not intended to imply that cognition does not play a unique role in the expression of perfectionism. On the contrary, results from the hierarchical regression analysis showed that

perfectionistic cognitions contributed additional variance in the prediction of procrastinatory cognitions, above and beyond that of the trait-model of perfectionism (strivings and concerns). Further insight can be gained from examining what components of perfectionistic cognitions (e.g., ruminations, self-criticism) uniquely predict procrastinatory cognitions, and to what extent, if at all, these components are captured by the trait-dimension of perfectionistic concerns.

Cumulatively, the findings in this study show that effect sizes were largest between procrastinatory cognitions and both perfectionistic cognitions and perfectionistic concerns (trait-cognitive association, and cognitive-cognitive association). This suggests that, it is procrastinatory cognitions, and not perfectionistic cognitions, that amplify the perfectionism-procrastination association. Although not hypothesized, results also showed that, for any measure of perfectionism, the effect size was always larger when procrastination was measured from a cognitive perspective. For instance, for perfectionistic concerns, correlations were of small-to-medium effect size with trait procrastination ($r = .23$), but of medium-to-large effect size with procrastinatory cognitions ($r = .49$). Similarity, perfectionistic strivings' association with trait-procrastination was approaching zero ($r = -.04$), but its association with procrastinatory cognitions was larger ($r = .14$). Associations with perfectionistic cognitions were of small effect size with trait-procrastination ($r = .12$), but of medium-to-large effect size with procrastinatory cognitions ($r = .47$). These findings indicate that the cognitive expression of procrastination, in terms of automatic thoughts, plays a vital role in the link between perfectionism and procrastination.

Further, these findings provide a necessary clarification regarding current inconsistencies in the literature. A small-to-medium effect size, as reported by Sirois et al. (2017), is indeed found between perfectionism and procrastination when the constructs are measured from a trait perspective. However, when using cognitive measures, specifically for procrastination, the magnitude of this association increases (Flett, Stainton, et al., 2012). As such, it may be possible that, due to an overemphasis on the trait components of procrastination, the degree of association between perfectionism and procrastination has been underestimated in the literature. In examining this possibility, an important question that must be raised is: why would perfectionism demonstrate a larger association with procrastinatory cognitions than with trait procrastination? Two interpretations for these findings are considered.

At first glance, it may appear that the Procrastinatory Cognitions Inventory (ProcCI) is

"better" at capturing procrastination compared to the trait measure of procrastination (GPS). However, a second and more plausible interpretation of these findings is that there is a unique aspect in the cognitive expression of procrastination that is strongly linked to perfectionism. The ProcCI is a measure of automatic, negative, and self-defeating thoughts that are triggered by procrastination, while the GPS is a measure of procrastination tendencies. Thus, the ProcCI assesses "difficulties both in terms of performance and feelings about the self" (Flett, Stainton, et al., 2012, p.234). As such, it may be the case that perfectionists with high scores on the ProcCI are not necessarily procrastinating more, but are rather more cognitively distressed by their procrastinatory tendencies

We can take smoking as an example. Not all individuals who smoke are troubled by their smoking tendencies, and not all smokers who are distressed will be distressed to the same extent. Even when we control for the actual amount of smoking behaviours, we are likely to discover that, at the cognitive level, some individuals will be more distressed by their smoking habits than others. As with smoking, not all individuals who procrastinate will experience the same level of distress associated with their procrastination. Thus, findings in this study shed light on a very important reality that may exist for perfectionists: they may be more burdened by the cognitive distress associated with their procrastination than their actual procrastinatory acts. Although further research is necessary to ascertain this claim, Stainton et al. (2000) provided support for this rationale, in finding that the Procrastinatory Cognitions Inventory mediated the correlation between trait-procrastination and negative affect**.** They found that, in the absence of automatic negative thoughts, the association between emotional distress and procrastination diminished.

4.2 Mediation Analyses: Findings and Future Directions

Another objective in this study was to investigate whether the variables of fear of failure (FF) and overgeneralization of failure (OGF), independently and sequentially, mediated the associations between perfectionism and procrastination. Results show that FF mediated all associations between perfectionism and procrastination. This result is unsurprising, as fear of failure's association with both perfectionism and procrastination has been long-established (Frost et al., 1990; Solomon & Rothblum, 1984). In being preoccupied with thoughts about achieving perfection and concerns about making mistakes, the perfectionist who is faced with a challenging task is inevitably overwhelmed by the possibility of failure and what that failure would mean. Indeed, studies show that both perfectionistic cognitions and perfectionistic concerns are

positively are associated with FF (Flett, Stainton, et al., 2012; Conroy et al., 2007)

The pathway from FF to procrastination can be interpreted from the lens of emotion-regulation failure (Tice & Bratslavsky, 2000). When an individual fears failure, he/she is also likely to experience a high degree of negative affect (Conroy et al., 2002, Sagar & Stoeber, 2009), and, according to the theory of emotion-regulation failure, the individual who seeks to escape negative emotions will resort to avoidant coping strategies (Sirois & Pychyl, 2013); avoiding the task allows the perfectionist to avoid the negative emotions associated with it, which, in this case, are triggered by FF. Thus, in this way, FF leads the perfectionist to engage in procrastination. Indeed, studies have shown that FF is associated with both trait-procrastination (Haghbin et al., 2012) and with procrastinatory cognitions (Flett, Stainton, et al., 2012).

Interestingly, while the indirect effects via FF were positive for pathways with perfectionistic concerns and perfectionistic cognitions, indirect effects were negative for pathways with perfectionistic strivings, including both pathways with trait and cognitive measures of procrastination. This finding is consistent with the literature; while individuals with perfectionistic concerns are driven by a fear of failing, those with perfectionistic strivings are driven by a motivation to succeed (Slade & Owens, 1998). As such, those with perfectionistic strivings are less likely to be overwhelmed by fears of failures and are thus less likely to procrastinate. Yet, results from the correlation analyses contradict these findings, as they revealed a positive correlation between perfectionistic strivings and procrastinatory cognitions. Together, these findings may imply that FF is a central driving mechanism in the association between perfectionistic strivings and procrastinatory cognitions. Indeed, in this study, FF fully mediated the trait/str-cognitive association. These findings further shed light on the inconsistent links that can be found between perfectionistic strivings and procrastination (e.g., Sirois et al., 2017).

The magnitude of the indirect effects via FF were examined and compared. Results show that the indirect effect was largest for the association between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association). These results did not support the hypothesis that the association between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association) would yield the largest indirect effect. Results also revealed that indirect effects via FF were greater in pathways with procrastinatory cognitions, rather than pathways with trait-procrastination. Interestingly, this pattern was also observed in the

correlation analyses, which yielded greater effect sizes in associations with procrastinatory cognitions. Given that FF is associated with emotional distress in perfectionists (Conroy et al., 2002), and that the indirect effect via FF was greater in pathways with procrastinatory cognitions, then perhaps these findings suggest that perfectionists who also experience procrastinatory cognitions are likely to be more distressed. This preposition should be interpreted with caution as indirect effects between trait and cognitive pathways of procrastination were not statistically significant. Future research should examine the role of distress in these associations.

Importantly, the PFAI, which was used to measure fear of failure in this study, is comprised of 5 categories: shame and embarrassment, devaluing one's self-estimate, having an uncertain future, having important others losing interest, and upsetting important others (Conroy et al., 2002). Future research can extend the insight gained from this study, by exploring which domains of fear of failure are more pertinent to the perfectionism-procrastination association. For instance, Sagar and Stoeber (2009) found that, of all 5 domains, fear of shame and embarrassment was most pertinent to the association between perfectionism and negative affect. A similar investigation could be conducted for the perfectionism-procrastination link.

Regarding OGF, this variable mediated the pathways between perfectionistic concerns and both trait and cognitive measures of procrastination, as well as the pathways between perfectionistic cognitions and both trait and cognitive measures of procrastination. In being concerned about making mistakes, thinking about never repeating mistakes, and worrying about the consequences associated with mistakes, the perfectionist who is faced with a challenging task is highly attuned to any current or previous flaws and failures (Flett & Hewitt, 2007). In becoming aware of them, the perfectionist may generalize those failures to his/her global sense of self, yielding a feeling of *being* a failure. Flett, Goldstein, et al. (2012) found support for this, in discovering that all dimensions underlying perfectionistic concerns (concern over mistakes, doubts about actions, and socially prescribed perfectionism) positively correlated with OGF.

The pathway from OGF to procrastination can be interpreted from the perspective of emotion-regulation failure (Tice & Bratslavsky, 2000). Perceiving oneself as inherently flawed is likely to be distressing; Indeed, Kernis and colleagues (1989) found that OGF predicted negative affect. Thus, to relieve the unpleasant emotions triggered by overgeneralizing failures, the perfectionist, in accordance with the theory of emotion-regulation failure, will engage in avoidant coping mechanisms, such as procrastination (Sirois & Pychyl, 2013). In this way, OGF

may lead the perfectionist to engage in procrastinatory tendencies and cognitions.

Importantly, OGF did not mediate any of the pathways to perfectionistic strivings. This means that a sense of self-deficiency that may arise in reaction to failure does not underly the relationship between perfectionistic strivings and procrastination. Such a finding is unsurprising given that those with perfectionistic strivings have a more optimistic orientation following perceived failures (Lizmore et al., 2017), whereas OGF reflects a pessimistic orientation as is focused on maintaining a negative view of the self (Carver & Ganellen, 1983). To add, being motivated to achieve success rather than avoid failure (Slade & Owens, 1998), it could be that those with perfectionistic strivings are not as hypersensitive to personal shortcomings as individuals with perfectionistic concerns are. Notably, as associations between OGF and procrastination have not been previously examined in the literature, findings from this study are not only novel but also provide an avenue for further research.

The magnitude of the indirect effects via OGF were examined for all pathways, excluding those with perfectionistic strivings. While it was hypothesized that the largest indirect effect would be observed in the association between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association), the indirect effect was found to be largest for the association between perfectionistic cognitions and trait-procrastination (cognitive-trait association). Further, in contrast to indirect effects via FF, the indirect effects via OGF were consistently larger in pathways consisting of trait-procrastination rather than procrastinatory cognitions. This may suggest that, while FF may be linked to increased ruminations about procrastinatory tendencies, OGF may be more pertinent to procrastinatory tendencies. However, this preposition should be interpreted with caution as indirect effects between trait and cognitive pathways of procrastination were not statistically significant.

Finally, the sequential mediation analysis revealed that, except for the association between perfectionistic cognitions and procrastinatory cognitions, all other perfectionism-procrastination associations were mediated by the sequential effects of FF followed by OGF. These findings suggest that FF predicts the tendency to overgeneralize failures to one's sense of self, and this combination of effects drives the association between perfectionism and procrastination. Indeed, McGregor and Elliot (2005) discovered that FF significantly predicted OGF. To add, Kernis and colleagues (1989) found that OGF predicted lower levels of motivation for task-engagement, suggesting a direct link between OGF and procrastination. Finally, the link

between perfectionism and FF has also been established (e.g., Flett, Stainton, et al., 2012) and, together, these findings show that the sequential pathway is indeed supported by the literature. Of note is the significance of this sequential mediation for the pathways consisting of perfectionistic strivings. These pathways were not mediated by OGF alone. Yet, when OGF was combined with FF, the sequential mediation was significant. Again, these findings highlight the complex nature of perfectionistic strivings' association with procrastination.

The finding that FF followed by OGF did not mediate the pathway from perfectionistic cognitions to procrastinatory cognitions was surprising, given that, when examined separately, both variables mediated the cognitive-cognitive association. When tested together, the indirect effect via OGF became insignificant. This may suggest that FF had a significantly stronger impact on the association between perfectionism cognitions and procrastinatory cognitions, such that indirect effects via OGF and via both mediators became insignificant. So, while OGF alone does mediate the association, when it is combined with FF, it loses its significance because FF is a stronger mediator.

It may be that, when measuring both perfectionism and procrastination from a cognitive perspective, there is a greater focus on preventing future failures, rather than on the interpretation of current or past failures. Perhaps, because FF is central to the thoughts of perfectionists and procrastinators, they are constantly thinking about what they need to do in order to avoid failure. Flett et al. (1998) explained that the PerfCI does not only capture thoughts about current imperfections, but it also captures concerns about the need to achieve perfection in the future (e.g., "I've got to keep working on my goals"). Similarity, the ProcCI captures concerns about current procrastination and also about the need to avoid procrastination in the future (e.g., "I should be more responsible") (Stainton et al., 2000). As such, ruminating about the need to prevent failures may be more pertinent to the dual-cognitive association, than are self-evaluative interpretations of current or past failures.

4.3 Implications

The increase in the strength of the association between perfectionism and procrastination that is observed when procrastination is measured from a cognitive perspective has practical and theoretical implications. From a therapeutic perspective, there may be a necessity to explore the underlying thought processes that procrastinators experience in order to devise an effective intervention that would not only address procrastinatory habits, but also the maladaptive

thoughts that may accompany these habits. Further, based on the theory of mood-regulation, it appears that affect plays an important role in procrastination (Sirois & Pychyl, 2013), and findings across various studies show that negative thoughts can trigger negative affect (e.g., Stainton et al., 2000). From this perspective, therapeutic approaches that emphasize the interplay between thoughts and emotions may be even more effective for reducing procrastination; as such, cognitive-behavioural therapy (CBT) has been found to be a very effective approach for reducing procrastination (Rozental et al., 2018).

Further, findings from this study suggest that perfectionists, who are likely already distressed from their perfectionistic demands and cognitions, are additionally burdened by the "added weight" of their self-defeating, procrastinatory thoughts. This heightened level of distress may have clinical consequences. As both perfectionism and procrastination confer vulnerability to depression independently (Smith et al., 2016; Flett et al., 2016), it may be that individuals who are jointly burdened by perfectionistic tendencies and procrastinatory thoughts may be at heightened risk for depression. From a therapeutic perspective, treating individuals who are suffering from both perfectionism and procrastination may require a tailored approach which addresses the overlap in cognitive, affective, and behavioural components underlying these conditions. For instance, rumination is a key component in both perfectionistic cognitions and procrastinatory cognitions (Flett, Stainton, et al., 2012; Flett et al., 2016). Thus, rumination-reduction interventions, such as mindfulness-based therapies (see Hawley et al., 2014), may be one way to effectively target both perfectionism and procrastination. Additionally, as findings in this study show that both FF and OGF play an important role in the perfectionism-procrastination link, this might be another area of overlap that can be targeted. Studies show that FF is linked to reduced levels of self-compassion (Neff et al., 2005) and OGF is related to reduced mindfulness (Feldman et al., 2007). As such, interventions that implement both elements of mindfulness and self-compassion may prove to be useful for individuals who are jointly burdened by perfectionistic habits and procrastinatory thoughts (e.g., James & Rimes, 2018).

4.4 Limitations and Future Directions

Several limitations exist in this study, and they are discussed in terms of the implications that they can pose for this study and future research. First, it should be noted that participants in this study were undergraduate students from a single university. This sample may not be demographically and geographically representative, as all individuals were between the ages of

18-27 and were living in Ontario, Canada. As a result, findings from this study may not be generalizable to other populations. In addition, as almost three quarters of the sample were females, results obtained in this study may be less applicable to male populations. Another methodological limitation of this study is the self-report nature of the measures employed. As with any self-report questionnaire, concerns exist regarding the close-ended nature of rating scales which may fail to sufficiently capture participants' experiences, whether or not participants comprehend those questions correctly, and the extent to which their responses are honest and free of bias (Schwartz, 1999).

A conceptual limitation in this study is the operational definition used for trait-perfectionism. The overarching dimensions of perfectionistic strivings and perfectionistic concerns encompass various subordinate dimensions which, when examined separately, can provide more insight on the perfectionism-procrastination association. For instance, studies have found that, of all subscales of the HFMPS, socially prescribed perfectionism (SPP) was most strongly predictive of depression (Sherry et al., 2003). As such, it may be that certain subscales that have been submerged under the superordinate dimensions may be more pertinent to the perfectionism-procrastination association than others. Future studies may benefit from exploring associations between procrastination and subscales of perfectionism, as this may provide further insight regarding the components of perfectionism (e.g., fear of making mistakes, setting high standards, others' standards) that are most relevant to procrastination.

The decision to measure the superordinate dimensions of perfectionism as composite variables represents another methodological limitation in this study. In examining the association between perfectionism and procrastination, Smith et al. (2017) found that perfectionistic strivings supressed the association between perfectionistic concerns and trait-procrastination. To address this, Smith et al. (2017) recommended measuring PS and PC as latent rather than composite factors. As this recommendation was not adopted in this study, it may be that the degree of association between PC and measures of procrastination was underestimated. Future studies should measure trait-perfectionism using latent factors and examine if this methodological approach bears any influence on the effect size obtained for the association between PC and (both trait and cognitive) procrastination.

Regarding the statistical procedures used in this study (correlation and mediation), two limitations are noted. As correlation does not imply causation, the results obtained in this study

cannot, alone, provide definitive support for the underlying self-regulation models, which illustrated the pathway between perfectionism and procrastination. Future studies can use experimental designs to gain greater insights on the mechanisms linking perfectionism to procrastination. As this was a cross-sectional study, it is also important to note that findings from the mediation analyses may not hold true longitudinally (Maxwell & Cole, 2007); in instances where indirect effects were found to be statistically significant, these effects may be negligible longitudinally. As an example, the finding that perfectionistic concerns positively predicted FF which positively predicted procrastinatory cognitions can be unsubstantiated in the long-term. Future studies should investigate if the indirect effects of FF and OGF are replicable in a longitudinal design.

Regarding employing a longitudinal design, there are benefits that can also be gained on a more conceptual level. Smith et al. (2016) argue that the use of cross-sectional designs in perfectionism literature may paint an inaccurate depiction, particularly regarding the association between perfectionistic strivings and depression; PS confer vulnerability to depression overtime, via a multitude of stressful events. Following from this, it is also possible that the association between PS and procrastination, which was found to be of small effect size, may be larger when examined longitudinally. Although Rice and colleagues (2012) did conduct a study assessing the longitudinal association between perfectionism and procrastination, they did not examine PS or any of its subordinate dimensions. As findings from this study show that FF and OGF can pave the pathway from perfectionism to procrastination, there is good reason to hypothesize that perfectionistic thoughts and tendencies can, over the long term, have detrimental effects on procrastinatory tendencies and cognitions.

On a final note, another limitation in this study is that the consequences of the perfectionism-procrastination association were not explored. Arguably, one of the most important findings in this study is that the magnitude of the association between perfectionism and procrastination increased when procrastination was measured from a cognitive perspective. Such findings lend support to the possibility that procrastination-specific ruminations are detrimental. Future studies should explore this avenue of research by examining if the association between perfectionism and procrastinatory cognitions is associated with greater distress, such as greater levels of depression, than the association between perfectionism and trait-procrastination.

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Table 1.

Descriptive Statistics

Variable	*M*	*SD*	Skewness	Kurtosis	α
Perfectionistic strivings	105.06	21.08	-.27	-.25	.92
Perfectionistic concerns	108.42	25.21	.23	-.10	.91
Perfectionistic cognitions	79.53	16.83	-.18	-.33	.92
Trait procrastination	61.21	12.92	-.05	-.29	.88
Procrastinatory cognitions	59.10	14.53	-.25	-.51	.93
Fear of failure	3.36	.65	-.38	.14	.90
Overgeneralization of failure	24.09	6.25	-.29	-.40	.88

Table 2.

Bivariate correlations between measures of perfectionism, procrastination, fear of failure, and overgeneralization of failure

Variable	1	2	3	4	5	6	7
1. Perfectionistic strivings	1.00						
2. Perfectionistic concerns	$.54^{**}$	1.00					
3. Perfectionistic cognitions	$.67^{**}$	$.63^{**}$	1.00				
4. Trait procrastination	-.04	$.23^{**}$	$.12^{*}$	1.00			
5. Procrastinatory cognitions	$.14^{*}$	$.49^{**}$	$.47^{**}$	$.59^{**}$	1.00		
6. Fear of failure	$.22^{**}$	$.68^{**}$	$.42^{**}$	$.28^{**}$	$.48^{**}$	1.00	
7. Overgeneralization of failure	$.36^{**}$	$.57^{**}$	$.53^{**}$	$.31^{**}$	$.43^{**}$	$.60^{**}$	1.00

Note. $**p < .01, * p < .05$

Table 3.

Mean scores of study variables for males and females, and t-test results

Variable		N	*M*	*SD*	*t*-test	*p*
Perfectionistic strivings	Male	86	104.60	21.23	-.30	.76
	Female	238	105.40	20.95		
Perfectionistic concerns	Male	86	106.40	24.56	-.93	.35
	Female	233	109.35	25.36		
Perfectionistic cognitions	Male	86	76.45	15.90	-2.04	.04
	Female	234	80.75	17.03		
Trait procrastination	Male	86	59.71	12.83	-1.22	.22
	Female	235	61.69	12.92		
Procrastinatory cognitions	Male	86	58.51	14.04	-.407	.69
	Female	239	59.25	14.72		
Fear of failure	Male	86	3.31	3.37	-.64	.53
	Female	233	3.37	.62		
Overgeneralization of failure	Male	87	23.00	6.34	-1.98	.05
	Female	236	24.54	6.16		

Table 4.

Hierarchical regression analyses predicting procrastinatory
cognitions from trait-perfectionism and perfectionistic cognitions

Predictor	β	R^2	R^2 Change	F Change
Trait block		.26	.26	52.60**
Perf. strivings	-.16			
Perf. concerns	.57			
Cognitive block		.38	.13	63.75**
Perf. strivings	-.43			
Perf. concerns	.37			
Perf. cognitions	.54			

Note. Perf. = perfectionistic. **$p < .01$

Table 5.

Summary of indirect, direct, and total effects for the trait-perfectionism mediation model, examining perfectionistic strivings, perfectionistic concerns, fear of failure, trait-procrastination and procrastinatory cognitions

	Outcome Variable: Trait-Procrastination								
	Total Effects			Direct Effects			Indirect Effects		
	Regression	CI		Regression	CI		Regression	CI	
	Coefficient	Lower	Upper	Coefficient	Lower	Upper	Coefficient	Lower	Upper
	(β)	.5%	.5%	(β)	.5%	.5%	(β)	.5%	.5%
Perf. Strivings	-.227	-.376	-.065	-.187	-.344	-.028			
Fear of Failure							-.040	-.106	-.002
Perf. Concerns	.353	0.179	0.510	.191	-.065	.429			
Fear of Failure							.162	.007	.351
	Outcome Variable: Procrastinatory Cognitions								
Perf. Strivings	-.160	-.327	-.10	-.115	-.266	.043			
Fear of Failure							-.045	-.111	-.009
Perf. Concerns	.573	.429	.685	.390	.198	.612			
Fear of Failure							.183	.033	.347

Note. Perf. = perfectionistic. β represents standardized regression coefficients

Predictor variable is trait-perfectionism (perfectionistic strivings and perfectionistic concerns); mediator variable is fear of failure; outcome variables are trait-procrastination and procrastinatory cognitions.
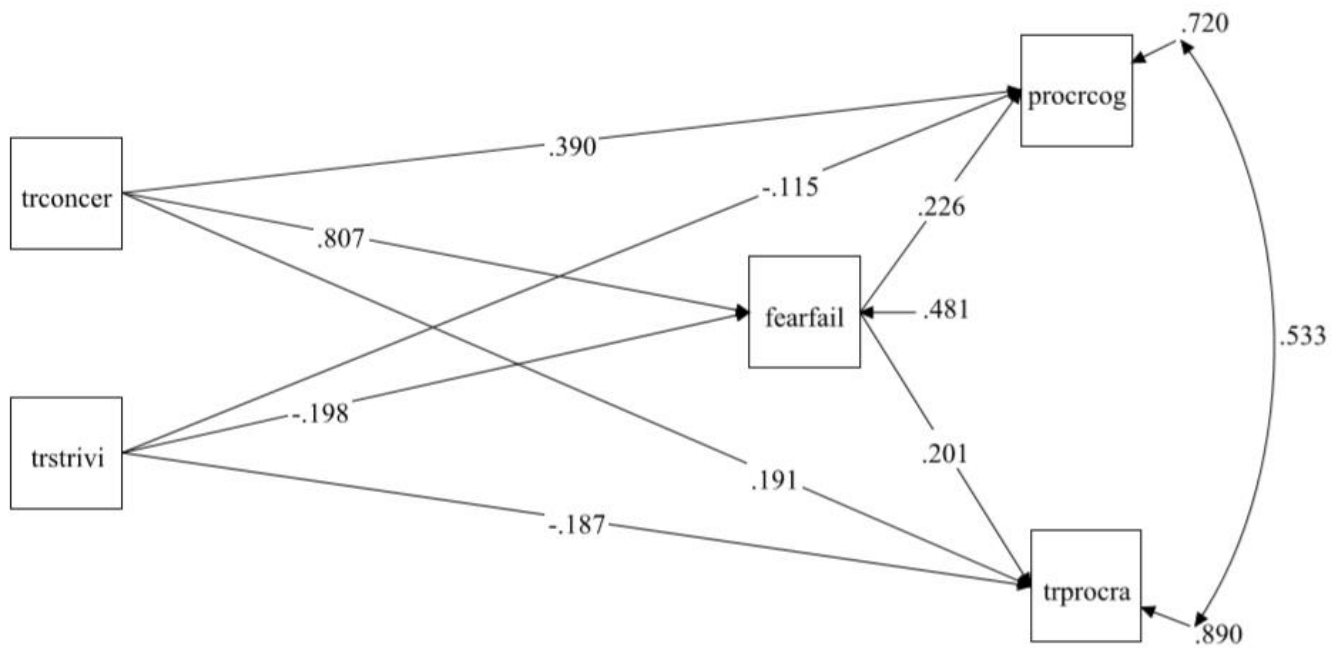
Figure 1. Trait-perfectionism mediation model, examining perfectionistic strivings, perfectionistic concerns, fear of failure, trait-procrastination, and procrastinatory cognitions

Note. trconcer = perfectionistic concerns; trstrivi = perfectionistic strivings; fearfail = fear of failure; trprocra = trait-procrastination; procrcog = procrastinatory cognitions

All regression coefficients are standardized

Predictor variables is trait-perfectionism (strivings and concerns); mediator variable is fear of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Pathways not statistically significant: perfectionistic concerns to trait procrastination (β = .191, *p* = .06, 95% CI [-.065, .429]); perfectionistic strivings to procrastinatory cognitions (β = -.115, *p* = .05, 95% CI [-.266, .043])

Table 6.

Summary of indirect, direct, and total effects for the cognitive-perfectionism mediation model, examining perfectionistic cognitions, fear of failure, trait-procrastination and procrastinatory cognitions

Outcome Variable: Trait-Procrastination

	Total Effects			Direct Effects			Indirect Effects		
	Regression Coefficient (β)	CI Lower .5%	Upper .5%	Regression Coefficient (β)	CI Lower .5%	Upper .5%	Regression Coefficient (β)	CI Lower .5%	Upper .5%
Perf. Cognitions	.120	-.027	.248	-.008	-.154	.149			
Fear of Failure							.129	.059	.217
Outcome Variable: Procrastinatory Cognitions									
Perf. Cognitions	.470	.347	.578	.326	.183	.452			
Fear of Failure							.144	.070	.221

Note. Perf. = perfectionistic. β represents standardized regression coefficients

Predictor variable is perfectionistic cognitions; mediator variable is fear of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Figure 2. Cognitive-perfectionism mediation model examining perfectionistic cognitions, fear of failure, trait-procrastination, and procrastinatory cognitions

Note. perfcog = perfectionistic cognitions; fearfail = fear of failure; trprocra = trait-procrastination; procrcog = procrastinatory cognitions

All regression coefficients are standardized

Predictor variable is perfectionistic cognitions; mediator variable is fear of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Pathways not statistically significant: perfectionistic cognitions to trait procrastination (β = -.008, p = .89, 95% CI [-.154, .149])

Table 7.

Summary of indirect, direct, and total effects for the trait-perfectionism mediation model, examining perfectionistic strivings, perfectionistic concerns, overgeneralization of failure, trait-procrastination and procrastinatory cognitions

	Outcome Variable: Trait-Procrastination								
	Total Effects			Direct Effects			Indirect Effects		
	Regression	CI		Regression	CI		Regression	CI	
	Coefficient	Lower	Upper	Coefficient	Lower	Upper	Coefficient	Lower	Upper
	(β)	.5%	.5%	(β)	.5%	.5%	(β)	.5%	.5%
Perf. Strivings	-.226	-.376	-.065	-.247	-.400	-.086			
OGF							.020	-.028	.078
Perf. Concerns	.353	.179	.509	.206	-.007	.377			
OGF							.147	.064	.275
	Outcome Variable: Procrastinatory Cognitions								
Perf. Strivings	-.160	-.327	-.011	-.177	-.330	-.038			
OGF							.017	-.023	.065
Perf. Concerns	.573	.436	.687	.447	.266	.581			
OGF							.126	.048	.223

Note. Perf. = perfectionistic; OGF = overgeneralization of failure. β represents standardized regression coefficients

Predictor variable is trait-perfectionism (perfectionistic strivings and perfectionistic concerns); mediator variable is overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions
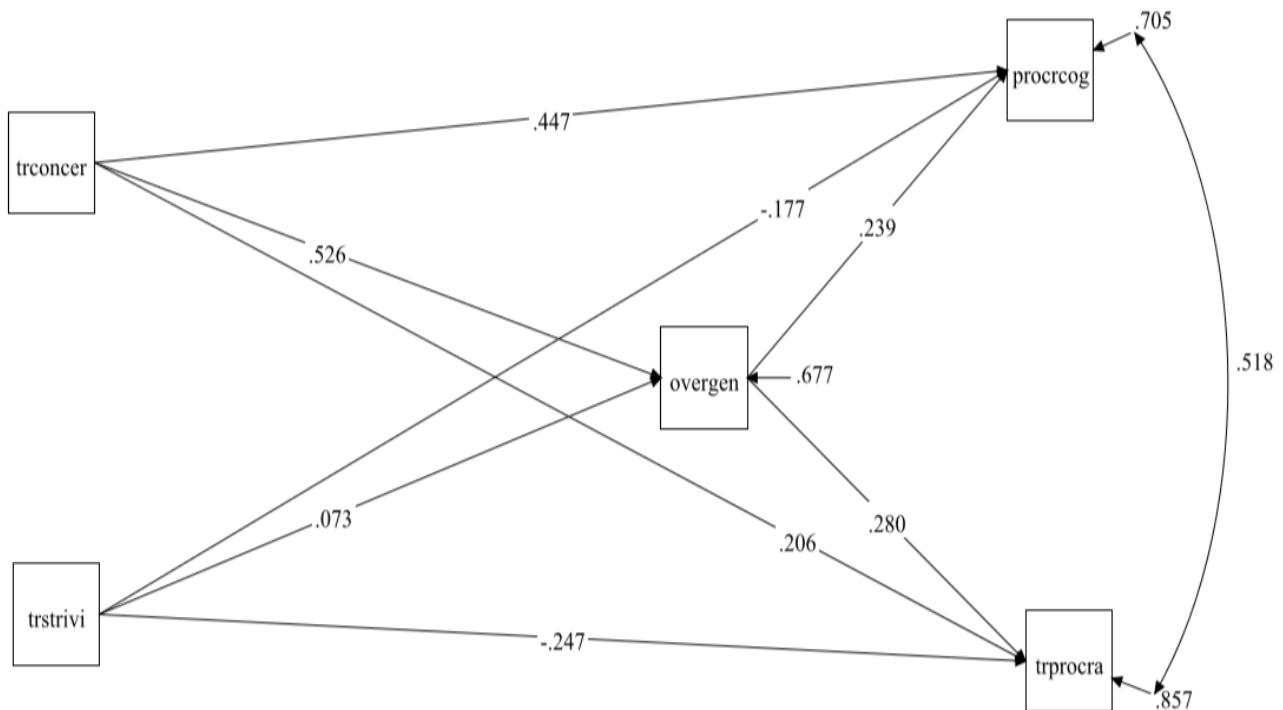
Figure 3. Trait-perfectionism mediation model, examining perfectionistic strivings, perfectionistic concerns, overgeneralization of failure, trait-procrastination and procrastinatory cognitions

Note. trconcer = perfectionistic concerns; trstrivi = perfectionistic strivings; overgen = overgeneralization of failure; trprocra = trait-procrastination; procrcog = procrastinatory cognitions

All regression coefficients are standardized

Predictor variable is trait-perfectionism (strivings and concerns); mediator variable is overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Pathways not statistically significant: perfectionistic concerns to trait procrastination ($\beta = .206$, $p = .007$, 95% CI [-.007, .377]); perfectionistic strivings to overgeneralization of failure ($\beta = .073$, $p = .26$, 95% CI [-.101, .234])

Table 8.

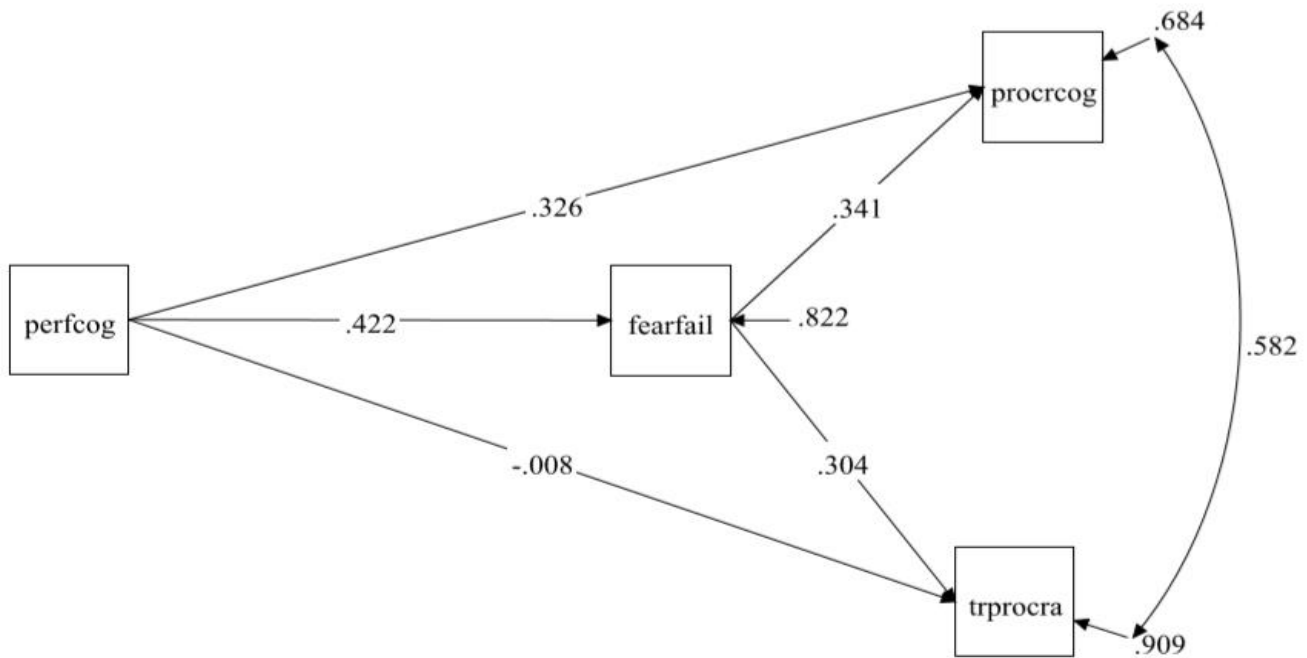*Summary of indirect, direct, and total effects for the cognitive-perfectionism mediation model, examining*
perfectionistic cognitions, overgeneralization of failure, trait-procrastination and procrastinatory cognitions

Outcome Variable: Trait-Procrastination

	Total Effects			Direct Effects			Indirect Effects		
	Regression Coefficient (β)	CI Lower .5%	Upper .5%	Regression Coefficient (β)	CI Lower .5%	Upper .5%	Regression Coefficient (β)	CI Lower .5%	Upper .5%
Perf. Cognitions	.120	-.021	.248	-.062	-.204	.079			
OGF							.182	.077	.275

Outcome Variable: Procrastinatory Cognitions

Perf. Cognitions	.470	.347	.578	.340	.201	.476			
OGF							.130	.043	.222

Note. Perf. = perfectionistic; OGF = overgeneralization of failure. β represents standardized regression coefficients

Predictor variable is perfectionistic cognitions; mediator variable is overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions
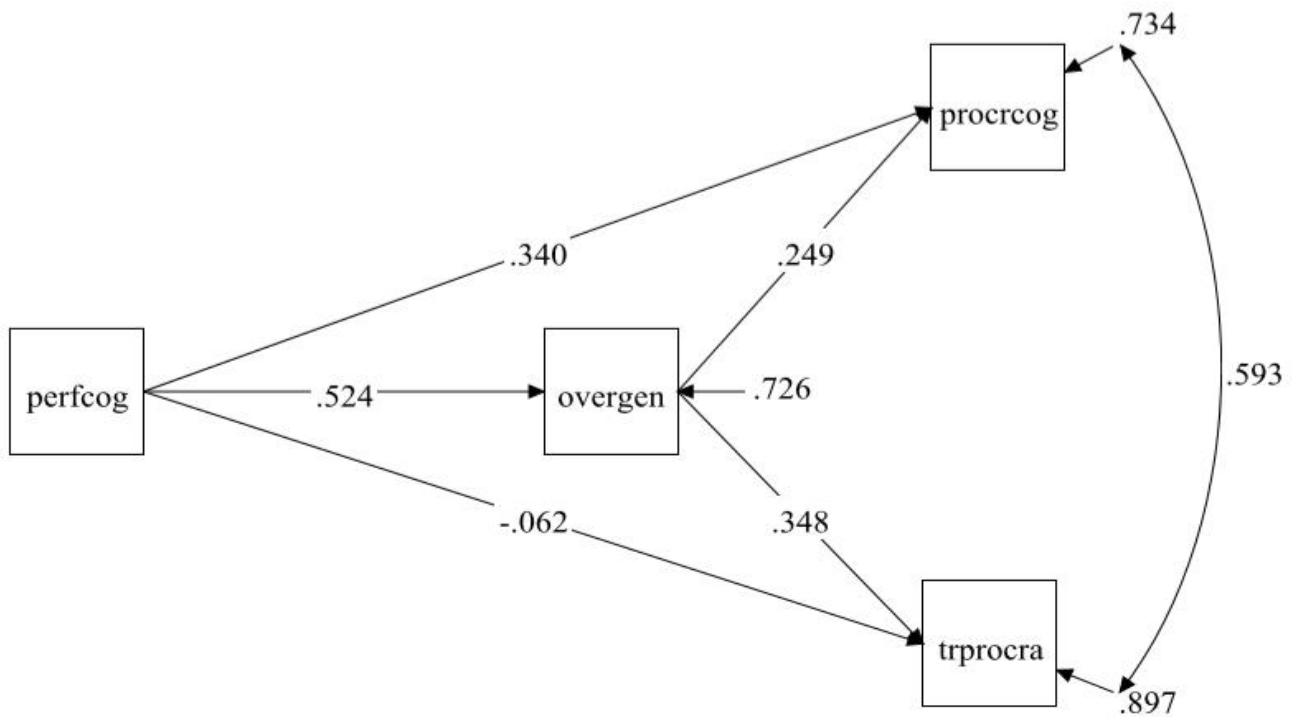
Figure 4. Cognitive-perfectionism mediation model, examining perfectionistic cognitions, overgeneralization of failure, trait-procrastination, and procrastinatory cognitions

Note. perfcog = perfectionistic cognitions; overgen = overgeneralization of failure; trprocra = trait-procrastination; procrcog = procrastinatory cognitions

All regression coefficients are standardized

Predictor variable is perfectionistic cognitions; mediator variable is overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Pathways not statistically significant: perfectionistic cognitions to trait procrastination (β = -.062, *p* = .27, 95% CI [-.204, .079])

Table 9.

Comparison of indirect effects, via fear of failure, between pathways consisting of trait-perfectionism

	Indirect Effects			Differences between Indirect Effects		
	Regression Coefficient (B)	CI		ΔB	CI	
		Lower .5%	Upper .5%		Lower .5%	Upper .5%
M1: Perfectionistic strivings and trait procrastination	-.040	-.108	.-010			
M2: Perfectionistic strivings and procrastinatory cognitions	-.045	-.144	-.008			
M2-M1				-.020	-.034	.050
M3: Perfectionistic concerns and trait procrastination	.162	.007	.346			
M4: perfectionistic concerns and procrastinatory cognitions	.183	.026	.349			
M4-M3				.005	-.167	.136

Table 10.

Comparison of indirect effects, via fear of failure, between pathways consisting of perfectionistic cognitions

	Indirect Effects			Differences between Indirect Effects		
	Regression Coefficient (B)	CI		ΔB	CI	
		Lower .5%	Upper .5%		Lower .5%	Upper .5%
M1: Perfectionistic cognitions and trait procrastination	.129	.056	.221			
M2: Perfectionistic cognitions and procrastinatory cognitions	.144	.073	.230			
M2-M1				-.015	-.076	.037

Table 11.

Comparison of indirect effects, via generalization of failure, between pathways consisting of trait-perfectionism

	Indirect Effects			Differences between Indirect Effects		
	Regression Coefficient (B)	CI		ΔB	CI	
		Lower .5%	Upper .5%		Lower .5%	Upper .5%
M1: Perfectionistic concerns and trait procrastination	.147	.061	.279			
M2: perfectionistic concerns and procrastinatory cognitions	.126	.046	.228			
M2-M1				.021	-.059	.101

Table 12.

Comparison of indirect effects, via generalization of failure, between pathways consisting of perfectionistic cognitions

	Indirect Effects			Differences between Indirect Effects		
	Regression Coefficient (B)	CI		ΔB	CI	
		Lower .5%	Upper .5%		Lower .5%	Upper .5%
M1: Perfectionistic cognitions and trait procrastination	.130	.081	.275			
M2: Perfectionistic cognitions and procrastinatory cognitions	.182	.042	.221			
M2-M1				.052	-.039	.125

Table 13.

Summary of indirect, direct, and total effects for the trait-perfectionism sequential-mediation model, examining perfectionistic strivings, perfectionistic concerns, fear of failure followed by overgeneralization of failure, trait-procrastination and procrastinatory cognitions

	Total Effects			Direct Effects			Indirect Effects		
	Regression	CI		Regression	CI		Regression	CI	
	Coefficient	Lower	Upper	Coefficient	Lower	Upper	Coefficient	Lower	Upper
	(β)	.5%	.5%	(β)	.5%	.5%	(β)	.5%	.5%
Outcome Variable: Trait-Procrastination									
Perf. Strivings	-.226	-.376	-.066	-.022	-.390	-.057			
FF							-.018	-.072	.019
OGF							-.040	.005	.109
FF & OGF							-.022	-.053	-.006
Perf. Concerns	.353	.179	.510	.148	-.141	.395			
FF							.073	-.078	.250
OGF							.042	-.002	.122
FF & OGF							.090	.031	.168
Outcome Variable: Procrastinatory Cognitions									
Perf. Strivings	-.160	-.327	-.010	-.146	-.303	.001			
FF							-.028	-.085	.009
OGF							.031	.003	.078
FF & OGF							-.017	-.040	-.004
Perf. Concerns	.573	.429	.685	.356	.144	.557			
FF							.114	-.049	.268
OGF							.033	-.002	.099
FF & OGF							.070	.020	.131

Note. Perf. = perfectionistic; FF = Fear of failure; OGF = overgeneralization of failure. β represents standardized regression coefficients

Predictor variable is trait-perfectionism (perfectionistic strivings and perfectionistic concerns); mediator variables are fear of failure and overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Figure 5. Trait-perfectionism sequential-mediation model, examining perfectionistic strivings, perfectionistic concerns, fear of failure, overgeneralization of failure, trait-procrastination, and procrastinatory cognitions

Note. trconcer = perfectionistic concerns; trstrivi = perfectionistic strivings; fearfail = fear of failure; overgen = overgeneralization of failure; trprocra = trait-procrastination; procrcog = procrastinatory cognitions

All regression coefficients are standardized

Predictor variable is trait-perfectionism (strivings and concerns); mediator variables are fear of failure, followed by overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions

Pathways not statistically significant: perfectionistic strivings to overgeneralization of failure (β = .161, p = .008, 95% CI [-.009, .317]); perfectionistic concerns to overgeneralization of failure *(β = .168, p = .03, 95% CI [-.029, .352]);* perfectionistic strivings to procrastinatory cognitions *(β = -.146, p = .01, 95% CI [-.303, .001]);* perfectionistic concerns to trait-procrastination *(β = .148, p = .14, 95% CI [-.141, .395]);* fear of failure to procrastinatory cognitions *(β = -.142, p = .07, 95% CI [-.058, .324]);* fear of failure to trait procrastination *β = -.091, p = .30, 95% CI [-.104, .302])*

Table 14.

Summary of indirect, direct, and total effects for the cognitive-perfectionism sequential-mediation model, examining perfectionistic cognitions, fear of failure followed by overgeneralization of failure, trait-procrastination and procrastinatory cognitions

	Total Effects			Direct Effects			Indirect Effects		
Outcome Variable: Trait-Procrastination									
	Regression Coefficient (β)	CI Lower .5%	Upper .5%	Regression Coefficient (β)	CI Lower .5%	Upper .5%	Regression Coefficient (β)	CI Lower .5%	Upper .5%
Perf. Cognitions	.120	-.020	.247	-.091	-.229	.065			
FF							.081	.003	.169
OGF							.013	.013	.164
FF & OGF							.048	.007	.090
Outcome Variable: Procrastinatory Cognitions									
Perf. Cognitions	-.470	.347	.578	.294	-.303	.001			
FF							.127	.045	.205
OGF							.031	-.022	.099
FF & OGF							.018	-.015	.052

Note. Perf. = perfectionistic; FF = fear of failure; OGF = overgeneralization of failure. β represents standardized regression coefficients.

Predictor variable is perfectionistic cognitions; mediator variables are fear of failure and overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions
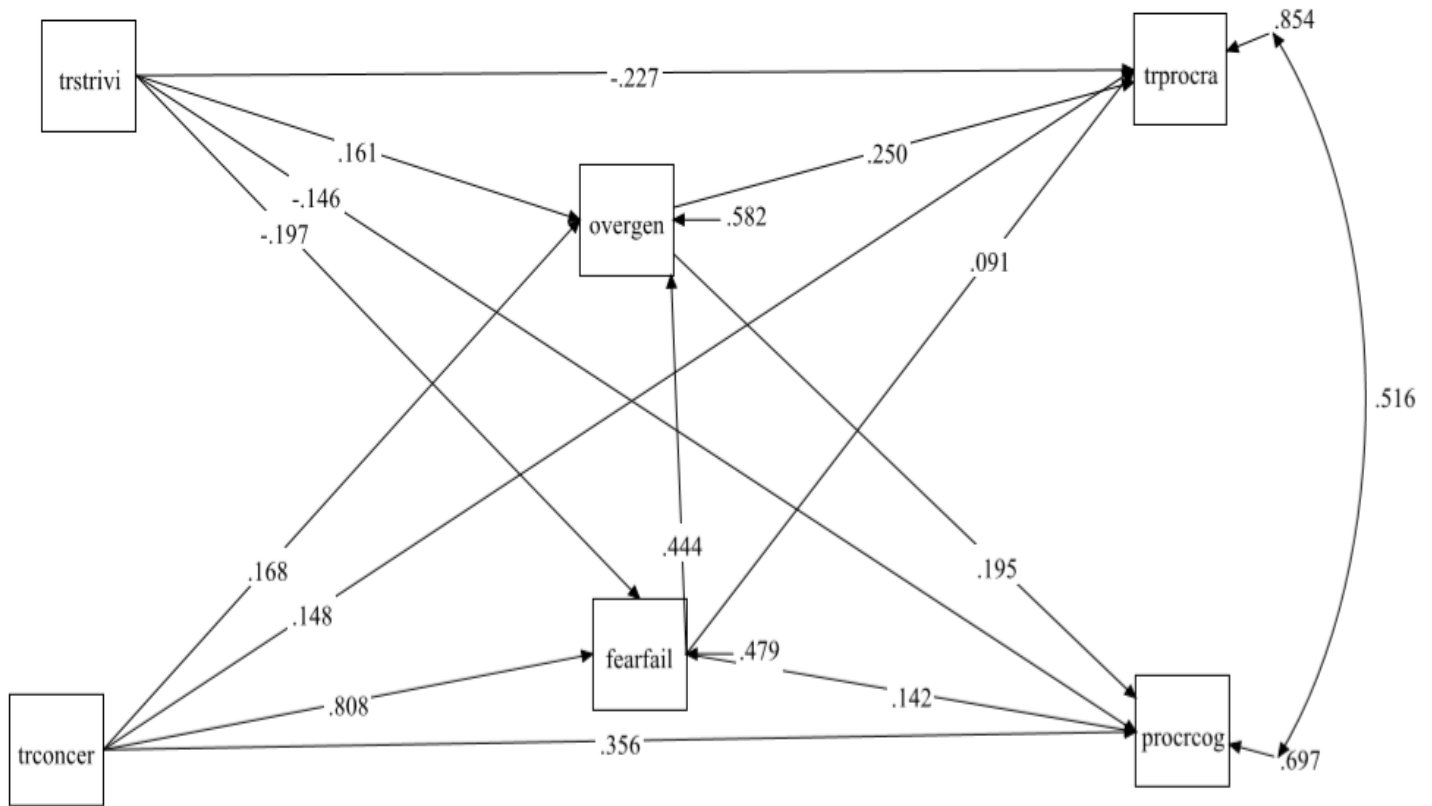
Figure 6. Cognitive-perfectionism sequential-mediation model, examining perfectionistic cognitions, fear of failure, overgeneralization of failure, trait-procrastination and procrastinatory cognitions

Note. perfcog = perfectionistic cognitions; fearfail = fear of failure; overgen = overgeneralization of failure; trprocra = trait-procrastination; procrcog = procrastinatory cognitions

All regression coefficients are standardized

Predictor variable is perfectionistic cognitions; mediator variables are fear of failure, followed by overgeneralization of failure; outcome variables are trait-procrastination and procrastinatory cognitions

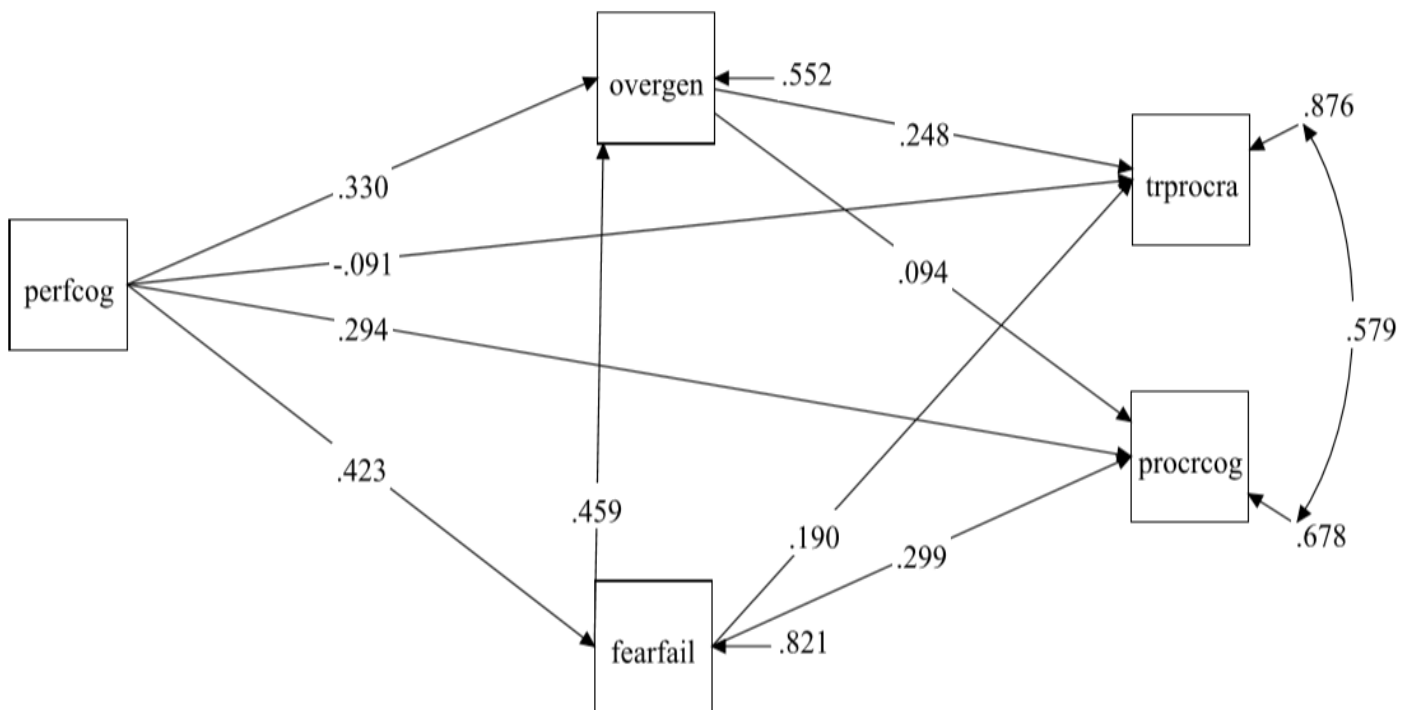Pathways not statistically significant: overgeneralization of failure to procrastinatory cognitions (β = .094, p = .14, 95% CI [-.089, .260]), perfectionistic cognitions to trait procrastination (β = -.091, p =.12, 95% CI [-.229, .065])

APPENDIX A:
List of Abbreviations

Measures	
PC	perfectionistic concerns
PS	perfectionistic strivings
FF	fear of failure
OGF	overgeneralization of failure
Associations	
trait-trait association	perfectionistic concerns and trait-procrastination
trait-cognitive association	perfectionistic concerns and procrastinatory cognitions
trait/str-trait association	perfectionistic strivings and trait-procrastination
trait/str-cognitive association	perfectionistic strivings and procrastinatory cognitions
cognitive-trait association	perfectionistic cognitions and trait-procrastination
cognitive-cognitive association	perfectionistic cognitions and procrastinatory cognitions
Scales	
FMPS	Frost Multidimensional Perfectionism Scale
HFMPS	Hewitt-Flett Multidimensional Perfectionism Scale
PerfCI	Perfectionism Cognitions Inventory
GPS	General Procrastination Scale
ProcCI	Procrastinatory Cognitions Inventory
PFAI	Performance Failure Appraisal Inventory
ATS	Attitudes Towards Self Scale

APPENDIX B:

List of Hypotheses

Hypothesis 1*:* Perfectionistic concerns and perfectionistic strivings (trait dimensions) will show differential associations with procrastination; perfectionistic strivings will significantly and negatively correlate with procrastination (with both trait and cognitive measures), while perfectionistic concerns will significantly and positively correlate with procrastination (with both trait and cognitive measures). Perfectionistic cognitions (cognitive measure) will significantly and positively correlate with procrastination (with both trait and cognitive measures).

Hypothesis 2: The magnitude of the correlations between perfectionism and procrastination will vary, from largest to smallest effect size, as follows: (1) correlation between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association); (2) correlation between perfectionistic cognitions and trait-procrastination (cognitive-trait association); (3) correlation between perfectionistic concerns and procrastinatory cognitions (trait-cognitive association); and (4) correlation between perfectionistic concerns and trait-procrastination (trait-trait association).

Hypothesis 3: Perfectionistic cognitions will explain the variance in procrastinatory cognitions above and beyond the variance accounted by trait-perfectionism (perfectionistic strivings and perfectionistic concerns).

Hypothesis 4.1: Fear of failure will mediate all (cognitive, trait, and mixed) pathways between perfectionism and procrastination.

Hypothesis 4.2: The magnitude of the indirect effect via fear of failure will be largest in the pathway between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association).

Hypothesis 5.1: Overgeneralization of failure will mediate all (cognitive, trait, and mixed) pathways between perfectionism and procrastination.

Hypothesis 5.2: The magnitude of the indirect effect via overgeneralization of failure will be largest in the pathway between perfectionistic cognitions and procrastinatory cognitions (cognitive-cognitive association).

Hypothesis 6: There will be a sequential mediation effect, via fear of failure followed by overgeneralization of failure, for all (trait, cognitive, and mixed) pathways between perfectionism and procrastination.

APPENDIX C:

Ethics Approval

1. Initial Approval From

Western
Research

Date: 31 July 2019

To: Dr. Donald Saklofske

Project ID: 114248

Study Title: Perfectionism and Procrastination: The mediating role of fear of failure and overgeneralization of failure

Short Title: Perfectionism and Procrastination

Application Type: NMREB Initial Application

Review Type: Delegated

Full Board Reporting Date: 06/Sep/2019

Date Approval Issued: 31/Jul/2019 10:30

REB Approval Expiry Date: 31/Jul/2020

Dear Dr. Donald Saklofske

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

Document Name	Document Type	Document Date	Document Version
Debriefing Form Revised 30.07.2019	Debriefing document	30/Jul/2019	2- Revised
LOI & Consent. Revised 30.07.2019	Written Consent/Assent	30/Jul/2019	2- Revised
Online Survey- Revised. 30.07.2019	Online Survey	30/Jul/2019	2-Revised
Recruitment Script. Revised. 30.07.2019	Recruitment Materials	30/Jul/2019	2- Revised

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Katelyn Harris, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

2. April 2020 Amendment Approval Form

Date: 24 April 2020

To: Dr. Donald Saklofske

Project ID: 114248

Study Title: Perfectionism and Procrastination: The mediating role of fear of failure and overgeneralization of failure

Application Type: NMREB Amendment Form

Review Type: Delegated

Full Board Reporting Date: 01/May/2020

Date Approval Issued: 24/Apr/2020 11:45

REB Approval Expiry Date: 31/Jul/2020

_____

Dear Dr. Donald Saklofske,

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the amendment, as of the date noted above.

Documents Approved:

Document Name	Document Type	Document Date	Document Version
LOI & Consent. Clean. 25.02.2020	Written Consent/Assent	25/Feb/2020	Clean
Online Survey.Clean. 30.07.2019 (no amendment)	Online Survey	30/Jul/2019	Clean. No Amendment

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Katelyn Harris, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

CARRICULUM VITAE
LITAL YOSOPOV

EDUCATION

2018 – 2020	**Master of Science, Clinical Psychology**
	University of Western Ontario

2013 – 2017	**Bachelor of Arts (Honours), Psychology/Business**
	York University

Honours Thesis*: The Correlates of Perfectionistic Symptomatology, including the Experience of Shame and the Overgeneralization of Failure*

AWARDS AND DISTINCTIONS

2017	**Summa Cum Laude [Highest Academic Distinction]**
	York University

2013 – 2017	**Member of Dean's Honour Roll**
	York University

2013 – 2014	**Dean's Award for Academic Excellence in the Faculty of Liberal Arts and Professional Studies [$450]**
	York University

2013	**York University Entrance Scholarship [$8,000]**
	York University

EMPLOYMENT HISTORY

2018 – 2020	**Graduate Teaching Assistant**
	University of Western Ontario

2017 – 2018	**Client Service Representative**
	TD Canada Trust Bank

2016 – 2017	**Projects Coordinator**
	York University

2016	**Research Assistant**
	York University

SERVICE ACTIVITIES

2020   **COVID-19 Support-Line Volunteer**
                                        University of Western Ontario & London Middlesex Health Unit

2018 – 2020   **Advocacy through Action, Committee Member**
                                        University of Western Ontario

PROFESSIONAL ACTIVITIES

2020   **Clinical Psychology Practicum Student**
                                        University Hospital, London Health Sciences Centre

2019 – 2020   **Co-supervisor for Psychology Honours Thesis Student, Catherine Li**
                                        University of Western Ontario

2019 – 2020   **Ad Hoc Journal Reviewer**
                                        Journal of Happiness Studies
                                        Journal of Personality and Individual Differences
                                        Current Psychology Journal

RESEARCH CONTRIBUTIONS

Conference Symposia:

Lau, C., Chiesi, F., Yosopov, L., & Saklofske, D.H. (2019. March). *The combinative role of traits cheerfulness and seriousness in predicting resiliency and well-being: A moderated mediation model.* Poster presented at the Western Student Research Forum, London, Ontario.

Yosopov, L., Lau, C., & Saklofske, D.H. (2019. May). *Humour and Life Satisfaction: the mediating role of resiliency.* Poster presented at the WWW2019 Conference, Waterloo, Ontario.

Yosopov, L., Lau, C., & Saklofske, D.H. (2019. September). *Does emotional intelligence predict emotional toughness? The mediating role of resiliency in the relationship between emotional intelligence and satisfaction with life*. Poster presented at the OACCPP Conference, Toronto, Ontario.