Adaptive and Maladaptive Outcomes of Perfectionism and Changes After Mindfulness Training

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Abstract

Considerable debate exists in the personality literature regarding the adaptiveness versus maladaptiveness of perfectionism. Study 1 (N = 240) involved a two-phase design to examine main and interactive effects of perfectionism dimensions predicting adaptive outcomes (i.e., well-being, achievement, motivation) and maladaptive outcomes (i.e., psychological distress, repetitive thought, procrastination) over a semester. The results largely supported the 2 × 2 model of perfectionism. Pure personal standards (PSP) predicted higher levels of many of the adaptive outcomes and lower levels of some of the maladaptive outcomes compared to no tendency towards perfectionism. Pure evaluative concerns (ECP) predicted lower levels of adaptive outcomes and higher levels of maladaptive outcomes than no tendency towards perfectionism. A mixed combination buffered both the adaptive benefits of high personal standards and the maladaptive effects of high evaluative concerns. Mediation models indicated that: (1) worry and rumination mediated pure ECP and negative affect, (2) self-regulation mediated pure ECP and procrastination, (3) mindfulness mediated pure PSP and positive affect, and (4) intrinsic motivation mediated pure PSP and goal achievement, while extrinsic motivation did not mediate this relationship. Study 2 used a randomized controlled trial to investigate if perfectionism's adaptive and maladaptive outcomes are altered through mindfulness training. Although the mindfulness group (n = 23) and the control group (n = 25) did not change in adaptive outcomes, the control group increased in ECP and many maladaptive outcomes compared to the mindfulness group. Training in mindfulness, and particularly in observing and non-reactivity, may protect against increases in negative affect, rumination, stress, and procrastination among students.

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LIST OF ABBREVIATIONS

AMS	Academic Motivation Scale – College Version
BIDR	Balanced Inventory of Desirable Responding
DASS-21	Depression Anxiety Stress Scales-21
ECP	Evaluative Concerns Perfectionism
FFMQ	Five Facet Mindfulness Questionnaire
GPA	Grade Point Average
IPS	Irrational Procrastination Scale
MPS	Multidimensional Perfectionism Scale
PANAS	Positive and Negative Affect Schedule
PRF-IN	Personality Research Form – Infrequency Scale
PSP	Personal Standards Perfectionism
PSWQ	Penn State Worry Questionnaire
RRS	Rumination Response Scale
SCMS	Self-Control Self-Management Scale
SLSS	Brief Multidimensional Student Life Satisfaction Scale – College Version

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GENERAL INTRODUCTION

The field of positive psychology has reclaimed an adaptive focus by investigating the well-being and achievement benefits of a number of psychological variables. The fundamental premise of this field is to employ psychological science to conceptually and empirically answer questions such as "what makes for a happy and successful life?" (Grant & Swartz, 2011, p. 61). Furthermore, positive psychology suggests that health and happiness is more than simply the absence of illness, but also the presence of positive traits and experiences (Slade, 2010). One individual difference variable receiving empirical attention to understand its potential adaptive[1] and maladaptive effects on an individual's functioning is perfectionism. Dispositional perfectionism is the tendency to strive towards perfection, improvement, and high standards. Over the past decade, there has been lively debate throughout the personality literature regarding the adaptiveness versus maladaptivess of perfectionism, as the setting and striving for high standards is not in and of itself pathological (Frost, Marten, Lahart, & Rosenblate, 1990). Research to date has led to some inconsistent findings when examining perfectionism in relation to adaptive and maladaptive outcomes (Owens & Slade, 2008). Although perfectionism is related to various forms of psychological distress, this disposition is also indicated as largely adaptive in particular contexts, such as work, sport, and academic contexts (Gotwals, Stoeber, Dunn, & Stoll, 2012; Verner-Filion & Gaudreau, 2010). It is possible that perfectionism may be both adaptive and maladaptive, as it is a multidimensional personality construct.

[1]The term adaptive is used in a psychological context and refers to dispositions or behaviours that help individuals adjust and function in changing social environments.

It is relevant to examine the adaptive and maladaptive aspects of perfectionism in the context of environments that are characterized by high standards. University settings have elevated performance demands, and whether explicitly or implicitly, this environment encourages perfection from students. Moreover, research indicates that two thirds of student samples are classified as perfectionistic (Grzegorek, Slaney, Franze, & Rice, 2004). There is societal relevance to empirically examining perfectionism, as researchers have purported that "a strong case can be made for the claim that perfectionism is *endemic* to Western culture" (Flett & Hewitt, 2002, p. xi). Perfectionism may be an adaptation of a given culture's values as some societies, particularly Western societies, highly emphasize orientation to detail and a willingness to work hard (Somov, 2010). In alignment with positive psychology, it is important to examine the personality construct of perfectionism in relation to subjective well-being and achievement, and determine how these positive outcomes can be encouraged to maintain and enhance the development of healthy student populations.

The current investigation will extend prior perfectionism research by examining a relatively novel theoretical framework, namely the 2 × 2 model. Gaudreau and Thompson (2010) proposed this model, which focuses on all possible combinations of the core perfectionism dimensions rather than the dimensions themselves, in an effort to distinguish the adaptiveness and maladaptiveness of perfectionism. A few studies have examined the 2 × 2 model in university samples; however, these studies employ cross-sectional designs (Douilliez & Lefèvre, 2011; Franche, Gaurdeau, & Miranda, 2012; Gaudreau & Thompson, 2010; Smith, Saklofske, Yan, & Sherry, 2014). Thus, two longitudinal studies were conducted to examine potential adaptive and maladaptive

outcomes of perfectionism in university students, by examining the separate dimensions, as well as the interaction between dimensions when combined within an individual.

The overall aim of this investigation was to examine when and how perfectionism benefits or harms subjective well-being and academic outcomes in students. The current research examined: (1) whether, and in what manner, perfectionism combinations are related to adaptive outcomes (i.e., subjective well-being, achievement, and motivation) and maladaptive outcomes (i.e., psychological distress, procrastination, and negative repetitive thought) over an academic semester, and (2) the stability of these outcomes, namely, if perfectionism's adaptive effects can be enhanced and maladaptive effects minimized over time through the training of mindfulness skills.

Dimensions of Perfectionism

Multidimensional Models of Perfectionism

Early conceptualizations of perfectionism were mainly unidimensional and focused on cognitive correlates. For instance, Beck (1976) conceptualized perfectionism as a form of cognitive dysfunction characterized by dichotomized thinking and overgeneralization. Similarly, Burns (1980) postulated that perfectionists suffer from cognitive impairments, such as those mentioned by Beck, as well as "should" systems (e.g., "I shouldn't have messed up!"). Perfectionism was first conceptualized as a multidimensional construct in 1978, when Hamachek postulated that perfectionism consists of two dimensions: (1) normal perfectionism (i.e., a healthy dimension), and (2) neurotic perfectionism (i.e., an unhealthy dimension; Hamacheck, 1978). Not until more recently has perfectionism been comprehensively conceptualized as a dispositional

construct consisting of multiple dimensions and involving intrapersonal and interpersonal aspects (Hewitt & Flett, 1991).

One of the most studied contemporary models of multidimensional perfectionism was derived by Hewitt and Flett (1991), and consists of self-oriented, other-oriented, and socially prescribed perfectionism. Self-oriented perfectionism involves self-directed perfectionist behaviours and refers to the tendency to set and seek high standards of performance for oneself. Other-oriented perfectionism focuses on the beliefs and expectations of the capabilities of others. It involves the tendency to expect high performance standards of others. Socially prescribed perfectionism involves the perceptions and beliefs that an individual must attain high standards and expectations prescribed by others. Specifically, individuals perceive that significant others expect perfection of them (Hewitt & Flett, 1991).

Prior examinations of the adaptive and maladaptive qualities of Hewitt and Flett's (1991) dimensions of perfectionism lead to inconsistent findings, particularly in the case of self-oriented perfectionism (Kilbert, Langhinrichsen-Rohling, & Saito, 2005). Although self-oriented perfectionism is positively and moderately related to anxiety and depression in clinical samples (Blankstein & Lumley, 2008; Hewitt, Flett, & Ediger, 1996), the research literature concerning self-oriented perfectionism in non-clinical samples is not as well established. Short and Mazmanian (2013) indicated that self-oriented perfectionism in undergraduate university students was unrelated to depression, anxiety, and negative affect, but a small positive correlation was found between self-oriented perfectionism and stress. Furthermore, some studies suggest that this dimension is positively associated (i.e., small to moderate correlations) with various adaptive

outcomes, such as motivation, self-efficacy for learning and performance, adaptive cognitive learning strategies, and effective resource management (Mills & Blankstein, 2000; Miquelon, Vallerand, Grouzet, & Cardinal, 2004). Perhaps, unlike clinical populations, some levels of self-oriented perfectionism in university settings may be related to an internal drive to achieve and may not lead to negative consequences. It is also suggested that self-oriented perfectionism is only related to adaptive outcomes when perfectionists are not overly concerned with mistakes or external evaluation (Stoeber & Yang, 2010); therefore, it is possible that the adaptiveness or maladaptivess of self-oriented perfectionism depends on whether maladaptive dimensions are also present.

In terms of other-oriented perfectionism, a number of studies have found small to moderate positive relationships between this dimension and psychological distress, while other studies have found no relationship between other-oriented perfectionism and anxiety or depression (Chang, Sanna, Chang, & Bodem, 2008). Short and Mazmanian (2013) indicated that other-oriented perfectionism appeared benign in university students and was not associated with positive affect or negative affect, or any other forms of psychological distress, such as depression, anxiety, and stress. Some researchers hypothesize that people with other-oriented perfectionism may be protected against forms of psychopathology because they blame others for negative life events (Shafran & Mansell, 2001). Moreover, research indicates that other-oriented perfectionism is positively associated with histrionic, narcissistic, antisocial, and uncaring personality characteristics (Hewitt & Flett, 1991; Stoeber, 2015). Thus, these perfectionists may not experience high levels of internal distress, but may experience other external maladaptive outcomes, such as interpersonal conflict.

Socially prescribed perfectionism is not involved in the adaptiveness versus maladaptiveness debate, as this dimension is consistently associated with various maladaptive outcomes, such as depression, anxiety, anger, and disordered eating (Hewitt et al., 1996; Flett, Hewitt, & DeRosa, 1996; Mushquash & Sherry, 2012; Nepon, Flett, Hewitt, & Molar, 2011). Longitudinal studies indicate that socially prescribed perfectionism strongly predicts increases in depression over time (O'Connor, Rasmussen, & Hawton, 2010). In addition, high levels of socially prescribed perfectionism are found in individuals who are diagnosed with social phobia, specific phobia, and generalized anxiety disorder (Antony, Purdon, Huta, & Swinson, 1998). These relationships appear to persist across clinical and non-clinical populations (Flett et al., 1996; Wheeler, Blankstein, Antony, McCabe, & Bieling, 2011). Overall, it is clear that socially prescribed perfectionism is a maladaptive form of perfectionism; however, examinations of self-oriented perfectionism result in inconsistent associations with adaptive and maladaptive outcomes.

Frost and colleagues (1990) also developed a multidimensional model of perfectionism that has been extensively examined in the perfectionism literature. This conceptualization consists of six dimensions of perfectionism: concerns over mistakes, doubts about actions, parental criticisms, parental expectations, personal standards, and organization. Research indicates that of these dimensions, personal standards is consistently and most strongly related to adaptive outcomes (e.g., positive affect), while concerns over mistakes is most strongly related to maladaptive outcomes (e.g., negative affect; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993).

Overlap between multidimensional conceptualizations. Hewitt and Flett's (1991) conceptualization and Frost and colleagues' (1990) conceptualization are both considered to involve narrow dimensions of perfectionism. These narrow perfectionism dimensions tend to have common underlying broad dimensions (Frost et al., 1993). When the dimensions from both conceptualizations were initially entered into a factor analysis, two factors emerged: (1) "personal standards perfectionism" (PSP), consisting of high standards, organization, self-oriented perfectionism, and other-oriented perfectionism, and (2) "evaluative concerns perfectionism" (ECP), consisting of concern over mistakes, doubts about actions, socially prescribed perfectionism, parental expectations, and parental criticism (Frost et al., 1993). Frost and colleagues (1993) found that only evaluative concerns perfectionism was related to higher levels of negative affect and depression, while personal standards perfectionism was related to positive affect.

Similar to the narrow dimensions, further analyses of the broad dimensions also revealed inconsistencies with adaptive outcomes. For example, Bieling, Israeli, and Antony (2004) found that personal standards perfectionism was related to both adaptive and maladaptive outcomes. This area is also plagued with other inconsistencies, such that the narrow dimensions of perfectionism subsumed within the broad dimensions change across studies (Stoeber & Otto, 2006). Additionally, the literature is inconsistent in regards to the terminology used to describe the broad dimensions of perfectionism, using the terms "personal standards" and "positive strivings" synonymously, as well as "evaluative concerns" and "perfectionistic concerns" synonymously. To decrease potential confusion within this document, personal standards perfectionism is used to

refer to the conceptually adaptive broad dimension, and evaluative concerns perfectionism is used to refer to the conceptually maladaptive broad dimension.

Although much empirical attention has been given to the adaptiveness of perfectionism, Hewitt and Flett (2007) argue that perfectionism is a "neurotic personality style" and that all forms of perfectionism have maladaptive aspects and are self-defeating as the standards that one set are impossible to achieve. Furthermore, these authors postulate that although some dimensions of perfectionism may be associated with adaptive variables concurrently, perfectionism is associated with psychological distress over time when one does not attain their goals; thus indicating that all perfectionism is maladaptive in the long-term (Hewitt & Flett, 2007). Therefore, longitudinal studies might clarify the outcomes of the perfectionism dimensions over time.

Overall, a large empirical base has developed regarding the adaptive and maladaptive aspects of separate dimensions of perfectionism; however, this method of investigation does not fully examine the potential of these dimensions. By examining the narrow or broad dimensions of perfectionism in isolation from other existing dimensions, interaction effects between the dimensions when they are combined within an individual cannot be observed. For example, although high levels of personal standards may be associated with adaptive outcomes, such as motivation, this finding does not reveal what the overall outcome will be for an individual experiencing high levels of personal standards combined with high levels of evaluative concerns. Failure to examine the combinations of dimensions is a predominant gap in the perfectionism literature and may relate to why there are inconsistent findings related to the adaptiveness versus maladaptiveness of perfectionism.

Tripartite Model of Perfectionism

Prior attempts to examine the combinations of perfectionism dimensions exist, and one of the most investigated efforts is the tripartite model (Stoeber & Otto, 2006). As previously mentioned, the perfectionism literature is inconsistent with regards to conceptualizing the two broad dimensions of perfectionism. To help clarify this matter, Stoeber and Otto (2006) reviewed the existing research and concluded that there is considerable agreement as to which narrow dimensions define the broad dimensions. Specifically, personal standards perfectionism consists of high personal standards and self-oriented perfectionism, and evaluative concerns perfectionism consists of concerns over mistakes, doubts about actions, parental expectations/criticism, and socially prescribed perfectionism. Thus, the authors found that the organization subscale from Frost and colleagues' (1990) conceptualization and the other-oriented perfectionism subscale from Hewitt and Flett's (1991) conceptualization can be excluded when conceptualizing the broad dimensions of adaptive and maladaptive perfectionism (Stoeber & Otto, 2006).

The tripartite model of perfectionism was also conceptualized from this review, integrating the two broad perfectionism dimensions to define three subtypes: (1) healthy perfectionists (high personal standards perfectionism and low evaluative concerns perfectionism), (2) unhealthy perfectionists (high personal standards perfectionism and high evaluative concerns perfectionism), and (3) non-perfectionists (low personal standards perfectionism; Stoeber & Otto, 2006; see Figure 1). That is, to be classified as a perfectionist, an individual must first have high personal standards. The form of perfectionism is then classified as healthy or unhealthy depending on whether the

individual also has low (i.e., healthy) or high (i.e., unhealthy) evaluative concerns. Stoeber and Otto's (2006) review of the perfectionism literature indicated some support for the tripartite model. However, Gaudreau and Thompson (2010) argue that although combining the perfectionism dimensions is essential, there are four relevant combinations of perfectionism rather than three.

2 × 2 Model of Perfectionism

The 2 × 2 model of perfectionism is a relatively new conceptual framework proposed by Gaudreau and Thompson (2010), and is particularly relevant to the adaptiveness versus maladaptiveness perfectionism debate. Similar to the tripartite model, this model examines a combination approach to the perfectionism dimensions; however, the 2 × 2 model examines all four possible combinations. The model posits that examining within-person combinations of the perfectionism dimensions is the key component in differentiating the adaptiveness versus maladaptiveness of perfectionism (Gaudreau & Thompson, 2010). Although the authors suggest that narrow perfectionism dimensions (e.g., self-oriented and socially prescribed) can also be examined within the 2 × 2 model framework, the current investigation examines the broad dimensions (i.e., personal standards and evaluative concerns perfectionism) to investigate a more comprehensive conceptualization of perfectionism.

Consistent with the broad dimensions defined in the tripartite model (Stoeber & Otto, 2006), evaluative concerns perfectionism is described as "a socially prescribed tendency to perceive that others are exerting pressure to be perfect, combined with a propensity to evaluate oneself harshly and to doubt one's capacity to progress towards elevated standards" (Gaudreau & Thompson, 2010, p. 532). Meanwhile, personal

standards perfectionism entails a "self-oriented tendency to set highly demanding standards and to conscientiously strive for their attainment" (Gaudreau & Thompson, 2010, p. 532). Similarly, evaluative concerns perfectionism and personal standards perfectionism represent narrow dimensions from Hewitt and Flett's (1991) model of perfectionism (i.e., self-oriented and socially prescribed), as well as narrow dimensions from Frost and colleagues' multidimensional conceptualization (1990; i.e., concerns over mistakes, doubts about action, parental pressures, and personal standards).

Of particular note, the 2 × 2 model does not posit that there are distinct naturally occurring categories of perfectionism, and data from this model should not be interpreted or analyzed in that manner (Franche et al., 2012; Stoeber, 2012). Thus, the 2 × 2 model refers to "combinations" of perfectionism, rather than "subtypes" of perfectionism as seen in the tripartite model.

Four Perfectionism Combinations of the 2 × 2 Model

As seen in Figure 2, the 2 × 2 model examines all possible combinations of the perfectionism dimensions within an individual: non-perfectionism, pure personal standards perfectionism, pure evaluative concerns perfectionism, and mixed perfectionism.

Non-perfectionism (low personal standards and low evaluative concerns). Non-perfectionists are not personally oriented towards perfectionistic strivings (low personal standards perfectionism), and they do not perceive that significant others are putting pressure on them to pursue perfectionistic standards (low evaluative concerns perfectionism). Individuals with this combination have little to no tendency towards perfectionistic cognitions or behaviours.

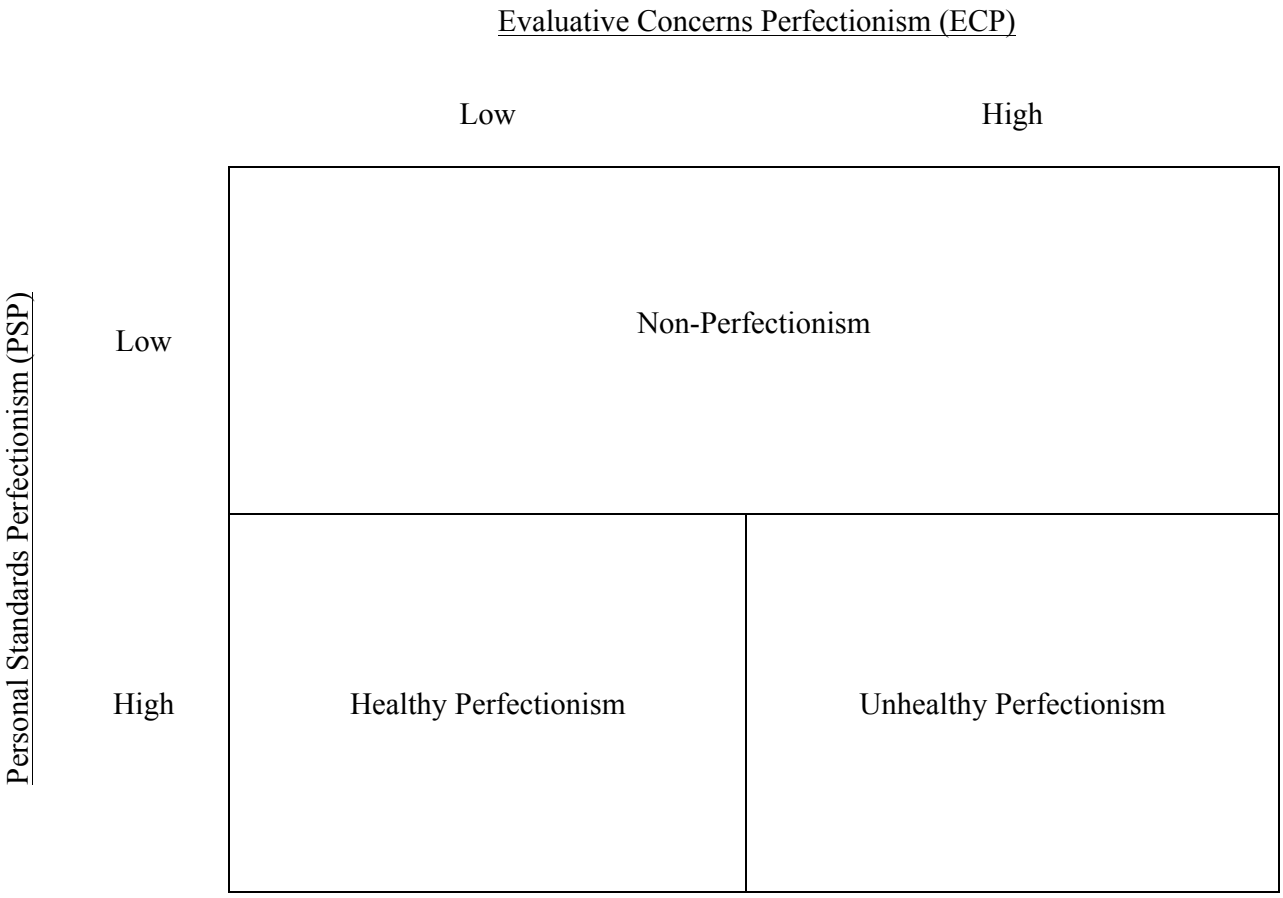

Figure 1. The Tripartite Model of Perfectionism. Adapted from Stoeber and Otto (2006), and Gaudreau and Thompson (2010).

Personal Standards Perfectionism (PSP)	Evaluative Concerns Perfectionism (ECP): Low	Evaluative Concerns Perfectionism (ECP): High
Low	Non-Perfectionism	Pure Evaluative Concerns Perfectionism
High	Pure Personal Standards Perfectionism	Mixed Profile of Perfectionism

Figure 2. The 2 × 2 Model of Perfectionism. Adapted from Gaudreau and Thompson (2010).

Pure personal standards perfectionism (high personal standards and low evaluative concerns). Pure personal standards perfectionists are individually oriented towards setting highly demanding standards and to conscientiously strive for their attainment (high personal standards perfectionism), but they do not perceive that others are exerting pressure on them to be perfect, nor do they harshly evaluate and doubt themselves when pursuing high standards.

Pure evaluative concerns perfectionism (low personal standards and high evaluative concerns). Pure evaluative concerns perfectionists have a combination of high evaluative concerns perfectionism and low personal standards perfectionism. Stoeber and Otto (2006) conceptualized this combination as non-perfectionists in the tripartite model. However, the 2 × 2 model conceptualizes this combination to be the most maladaptive combination. Individuals evaluate themselves harshly and pursue perfectionistic standards derived from perceived external pressure (high evaluative concerns perfectionism) without personally valuing or internalizing these standards (low personal standards perfectionism). Gaudreau and Thompson (2010) conceptualize this combination as a form of externally regulated perfectionism in which values, goals, and motives are mostly derived from pressure exerted by the social environment.

Mixed perfectionism (high personal standards and high evaluative concerns). Mixed perfectionists have coexisting high levels of evaluative concerns perfectionism and personal standards perfectionism. Rather than being categorized as unhealthy perfectionism as in the tripartite model (Stoeber & Otto, 2006), individuals with this combination perceive pressure from significant others to strive towards perfection, and also personally adhere to their own perfectionistic standards (Gaudreau & Thompson,

2010). The 2 × 2 model hypothesizes that mixed perfectionism is associated with more adaptive outcomes and higher levels of goal strivings compared to the combination of pure evaluative concerns perfectionism. Furthermore, the 2 × 2 model posits that mixed perfectionism is associated with less internalization of goal strivings and more maladaptive outcomes compared to pure personal standards perfectionism.

Based on this literature, four hypotheses of the 2 × 2 model are derived (Gaudreau, 2012; Gaudreau & Thompson, 2010). Pure personal standards perfectionism is the most relevant to the discussion of whether a perfectionistic disposition is adaptive. Individuals with high levels of internalized personal standards, without concerns about being negatively evaluated by others, may be inclined towards higher levels of subjective well-being and greater academic achievement, compared to those without perfectionistic tendencies. Gaudreau and Thompson (2010) outline three competing hypotheses for pure personal standards perfectionism and non-perfectionism to examine whether pure personal standards perfectionism is adaptive, maladaptive, or neutral. Hypothesis 1a of the 2 × 2 model suggests that pure personal standards perfectionism is more strongly related to adaptive outcomes, and less strongly related to maladaptive outcomes, than non-perfectionism. Hypothesis 1b of the 2 × 2 model suggests that non-perfectionism is more strongly related to adaptive outcomes, and less strongly related to maladaptive outcome, than pure personal standards perfectionism. Hypothesis 1c of the 2 × 2 model suggests that there are no differences between pure personal standards and non-perfectionism in terms of their relationships to adaptive and maladaptive outcomes.

Next, rather than being classified as non-perfectionistic as in the tripartite model, pure evaluative concerns perfectionism involves perfectionistic standards that are

externally regulated by those significant to one's life. Therefore, this combination should be differentiated from non-perfectionism. Hypothesis 2 of the 2 × 2 model suggests that pure evaluative concerns perfectionism is significantly different from non-perfectionism and is more strongly related to maladaptive outcomes, and less strongly related to adaptive outcomes, than any other combination.

Lastly, mixed perfectionism involves having high levels of internalized personal standards, as well as concerns about being negatively evaluated by others. Hypothesis 3 of the 2 × 2 model suggests that mixed perfectionism is more strongly related to adaptive outcomes and less strong related to maladaptive outcomes than pure evaluative concerns perfectionism. Hypothesis 4 of the 2 × 2 model suggests that pure personal standards perfectionism is more strongly related to adaptive outcomes and less strongly related to maladaptive outcomes than mixed perfectionism.

Notably, adaptiveness and maladaptiveness are not opposite ends of the same spectrum. The absence of a maladaptive outcome does not establish the presence of an adaptive outcome. For instance, the presence of stress is maladaptive; however, the absence of stress is not necessarily adaptive or indicative of an individual's ability to adapt to a changing social environment. However, a high level of satisfaction with life goes beyond baseline functioning and may be considered an adaptive outcome.

Potential Adaptive Outcomes

Subjective Well-being: Life Satisfaction and Positive Affect

Satisfaction with one's life and positive affect (i.e., a general measure of psychological adjustment that includes experiences such as feeling excited, proud, or determined.) are suggested indicators of subjective well-being. Satisfaction with life can

be measured across multiple domains, and relevant domains for university students may include family life, friends or social life, school or academic experience, oneself, living environment, romantic relationships, physical appearance, and overall life (Zullig, Huebner, Patton, & Murray, 2009). Research indicates that although some people are perfectionists across all domains of life, most individuals are perfectionists in select domains (Stoeber & Stoeber, 2009). Particularly in a student sample, individuals revealed high self-oriented perfectionism in the domains of school, work, presentation of documents, orderliness, mail, and oral presentations. Similarly, individuals revealed high socially prescribed perfectionism in the same domains, with the exception of orderliness (Stoeber & Stoeber, 2009). While Hewitt and Flett's (1991) multidimensional model of perfectionism incorporates interpersonal components of perfectionism, evident in the socially prescribed and other-oriented perfectionism dimensions, few studies conducted in university contexts examine dimensions of perfectionism in relation to domains of life satisfaction, beyond academic satisfaction. It is possible that some perfectionists may be excelling academically, while at the same time experiencing maladaptive outcomes due to deteriorating relationships with family, friends, and romantic partners.

Hewitt and Flett's (1991) model was previously examined in relation to these indicators of subjective well-being. Research reveals that self-oriented perfectionism is positively associated with academic satisfaction, while socially prescribed perfectionism is negatively associated with this domain (Verner-Filion & Gaudreau, 2010). Moreover, some research indicates that self-oriented perfectionism is positively associated (i.e., low to moderate correlations) with positive affect (Flett, Blankstein, & Hewitt, 2009). However, findings from Short and Mazmanian (2013) suggest that both self-oriented

perfectionism and other-oriented perfectionism are not correlated with positive affect. These results provide mixed evidence on whether self-oriented perfectionism is positively associated with well-being, or is benign in this regard.

Gaudreau and Thompson (2010) examined the relationships among the perfectionism combinations and positive affect in a university student sample. Findings indicated that pure personal standards perfectionism was associated with higher levels of positive affect compared to non-perfectionism. Pure evaluative concerns perfectionism was associated with lower positive affect compared to non-perfectionism. Moreover, mixed perfectionism was associated with higher positive affect compared to pure evaluative concerns, and lower positive affect compared to pure personal standards. These results support Gaudreau and Thompson's (2010) hypotheses 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model. The authors also examined satisfaction with life, but only within the academic domain. Results indicated that pure personal standards perfectionism was associated with higher academic satisfaction compared to non-perfectionism. Pure evaluative concerns perfectionism was associated with lower academic satisfaction compared to non-perfectionism. Mixed perfectionism was associated with higher academic satisfaction compared to pure evaluative concerns and lower academic satisfaction compared to pure personal standards. These results also support Gaudreau and Thompson's (2010) hypotheses 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism),

hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model.

Achievement: Grade Point Average, Goal Achievement, and Academic Satisfaction

Research commonly assesses academic success in students through academic goal attainment and grade point average (GPA). One benefit to including measures such as GPA and self-rated goal progress in this area of research is that these outcomes may provide more objective achievement measurement, beyond self-report questionnaires. In terms of Hewitt and Flett's (1991) dimensions of perfectionism, research indicates that self-oriented perfectionism is moderately and positively related to achievement striving and high academic performance (Verner-Filion & Gaudreau, 2010). In contrast, socially prescribed perfectionism is associated with poorer test performance (Flett et al., 2009).

Perfectionism combinations of the 2 × 2 model were also examined in relation to academic goal progress (Gaudreau & Thomspon, 2010). Pure personal standards perfectionism was associated with higher academic goal progress compared to non-perfectionism. Pure evaluative concerns perfectionism was associated with lower academic goal progress compared to non-perfectionism. Lastly, mixed perfectionism was associated with higher academic goal progress compared to pure evaluative concerns, and lower academic goal progress compared to pure personal standards. These results support Gaudreau and Thompson's (2010) hypotheses 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model.

Motivation: Self-Regulation, and Intrinsic and Extrinsic Motivation

Self-regulation is a theoretical model used to explain self-governing behaviour (MacKenzie et al., 2012). As described by Kanfer (1970) and Bandura's (1991) model, self-regulation skills are a pattern of awareness that involve focusing on one's behaviour and surroundings. Self-regulation comprises three facets: self-monitoring, self-evaluation, and self-reinforcement. Self-monitoring is the monitoring of the status and context of target behaviour. Self-evaluation occurs when the target behaviour is compared to an internalized standard of that behavior. Self-reinforcement is self-reward, or lack thereof, due to the discrepancy found in self-evaluation (Mezo, 2009). For example, if a student wished to achieve higher grades by spending more time studying, self-regulation skills could be employed. The student would observe and monitor his or her amount of time studying (self-monitoring), compare this amount of time to the amount he or she would like to achieve (self-evaluation), and finally praise oneself or take a break when he or she reaches that goal (self-reinforcement). This iterative feedback loop gradually motivates and enhances self-change and self-control. Self-regulation skills are particularly effective when environmental reinforcement is not present (Mezo & Heiby, 2004), such as studying without the encouragement of an external resource (e.g., a tutor).

Self-regulation is referred to by other terms, in particular self-control, self-management, and self-determination; however, all of these terms refer to this model of self-change (Mezo & Heiby, 2004). Other forms of self-determining behaviour include intrinsic and extrinsic motivation. Intrinsic motivation includes "doing something because it is inherently interesting or enjoyable", while extrinsic motivation concerns "doing something because it leads to a separable outcome" (Ryan & Deci, 2000, p.55).

Furthermore, amotivation is conceptualized as a lack of purpose or intentionality of one's behaviour and relates to the absence of motivation (Ryan & Deci, 2000).

Some research has examined perfectionism in relation to the self-regulatory model. One study indicated that socially prescribed perfectionism is related to low levels of self-evaluation, and self-oriented perfectionism is related to high levels of self-monitoring (Newby, Penney, Flett, Hewitt, & Klein, 2012). Furthermore, research reveals that self-oriented perfectionism is related to intrinsic and self-determined academic motivation (i.e., positive low to moderate correlations), while socially prescribed perfectionism is related to non-self-determined academic motivation (i.e., positive moderate correlation; Mills & Blankstein, 2000; Miquelon et al., 2005). Therefore, it is possible that the internally driven motivational aspects of self-oriented perfection may underlie relationships with adaptive outcomes, such as academic achievement.

Gaudreau and Thompson (2010) examined the relationships among the perfectionism combinations, as indicated in the 2 × 2 model, and academic self-determination. Pure personal standards perfectionism was associated with higher academic self-determination compared to non-perfectionism. Pure evaluative concerns perfectionism was associated with lower academic self-determination compared to non-perfectionism. Furthermore, mixed perfectionism was associated with higher academic self-determination compared to pure evaluative concerns, and lower academic self-determination compared to pure personal standards. These results support Gaudreau and Thompson's (2010) hypotheses 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism),

hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model.

Overall, subjective well-being, achievement, and motivation, appear to be relevant adaptive outcomes in the study of perfectionism among students. Differential relationships have been identified among these variables and perfectionism dimensions and combinations, as measured by the narrow dimensions of Hewitt and Flett's (1991) multidimensional model and the broad dimension combinations of the 2 × 2 model. Specifically, self-oriented perfectionism and pure personal standards perfectionism appear to be positively correlated with adaptive outcome variables, and socially prescribed perfectionism and pure evaluative concerns perfectionism appear to be negatively correlated with adaptive outcomes. While these results are valuable in the understanding of the adaptive aspects of perfectionism, the provided evidence relies on concurrent assessment of the relationships, limiting the ability to conclude that these adaptive variables are successive outcomes of this personality disposition.

Potential Maladaptive Outcomes

Psychological Distress: Depression, Anxiety, Stress, and Negative Affect

High rates of psychological distress exist within university populations. For instance, the rate of diagnosed depression among university students increased from 10% in 2000 to 15% in 2006 (American College Health Association, 2009). More recent rates have doubled, such that 30% of students indicated that depression interfered with their functioning in 2011 (American College Health Association, 2012). As previously discussed, differential relationships are indicated between the dimensions of Hewitt and Flett's (1991) model of perfectionism and forms of psychological distress. That is,

socially prescribed perfectionism is strongly related to high levels of depression, anxiety, stress, and negative affect (Mushquash & Sherry, 2012; Nepon et al., 2011; Short & Mazmanian, 2013), while self-oriented and other-oriented perfectionism reveal inconsistent relationships with psychological distress in student samples (Hewitt et al., 1996; Mills & Blankstein, 2000; Short & Mazmanian, 2013). Short and Mazmanian (2013) indicated that socially prescribed perfectionism was moderately and positively correlated with negative affect, depression, anxiety, and stress. Other-oriented perfectionism was not correlated with negative affect, depression, anxiety, or stress. Moreover, self-oriented perfectionism was not correlated with negative affect, depression, or anxiety, but indicated a low positive correlation with stress. Thus, other-oriented and self-oriented perfectionism appeared benign based on general affectivity.

Gaudreau and Thompson (2010) examined the relationships among the perfectionism combinations of the 2 × 2 model and negative affect. Findings indicated that pure personal standards perfectionism was associated with equal levels of negative affect compared to non-perfectionism. Pure evaluative concerns perfectionism was associated with higher negative affect compared to non-perfectionism. Moreover, mixed perfectionism was associated with lower negative affect compared to pure evaluative concerns perfectionism, and higher negative affect compared to pure personal standards perfectionism. These results support Gaudreau and Thompson's (2010) hypotheses 1c (i.e., pure PSP does not differ from non-perfectionism in terms of maladaptive outcomes), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is less maladaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model.

Procrastination

Procrastination is commonly defined as a tendency to delay tasks that need to be completed (Lay, 1986). Although competing conceptualizations of procrastination have been posited, namely the avoidance (putting off to avoid fear of failure), arousal (putting off to seek thrills), and decisional (putting off decisions) model, recent evidence more strongly supports the conceptualization that procrastination is an irrational delay (Steel, 2010). Procrastination, which has been described as a failure of self-regulation, is implicated as an outcome of perfectionism and is relevant to the academic context as this behaviour is often a barrier to goal attainment (Ferrari, 2001). Differential relationships exist between the dimensions of perfectionism and procrastination. Specifically, Flett, Blankstein, Hewitt, and Koledin (1992) indicated that socially prescribed perfectionism was moderately and positively associated with general and academic procrastination. Self-oriented and other-oriented perfection were not related to procrastination, but all three dimension of perfectionism were associated with an increased fear of failure. Procrastination has yet to be investigated in relation to the 2 × 2 model of perfectionism.

Negative Repetitive Thought: Worry and Rumination

Chronic worry is commonly defined as a chain of thoughts that are relatively uncontrollable, negatively affect-laden, and related to events with uncertain outcomes (Borkovec, Robinson, Pruzinsky, & DePree, 1983). Worry is a dimension underlying many anxiety disorders, such as generalized anxiety disorder, social phobia, panic disorder, and obsessive-compulsive disorder (Starcevic et al., 2007). Rumination is also related to negative affect and involves self-focused attention on past events (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Thus, like worry, the repetitive thought style of

rumination leads to unconstructive consequences and is a cognitive vulnerability marker of psychopathology (Goring & Papageorgiou, 2008).

Nolen-Hoeksema (1991) proposed a highly influential conceptualization of rumination within the Response Styles Theory of Depression. Within this conceptual framework, a ruminative response to negative events prolongs depressive episodes over time. The main aspects of this construct consist of reflection and brooding (Treynor et al., 2003). Reflection is neutrally affect-laden and is defined as engaging in contemplation to overcome problems and difficulties. Brooding is negatively affect-laden and concerns self-criticism and "moody pondering". Reflection is more self-focused, while brooding rumination focuses more on emotional symptoms and is typically more strongly associated with psychological distress (Treynor et al., 2003). Empirical evidence supports the Response Styles Theory of Depression and research suggests that brooding rumination prolongs depressed mood, even when controlling for initial levels of depression (Nolen-Hoeksema, Morrow, & Fredrickson, 1993).

Research conducted by Short and Mazmanian (2013) indicated that, among university students, higher levels of socially prescribed and self-oriented perfectionism, but not other-oriented perfectionism, are related to higher levels of worry and brooding rumination. Furthermore, empirical evidence suggests that worry and brooding rumination mediate the relationship between socially prescribed perfectionism and negative affect, when considered together and independently (Short & Mazmanian, 2013). Therefore, negative repetitive thought might be a mechanism underlying perfectionism and maladaptive outcomes, such as psychological distress. However, these

results were based on concurrent measurements. The 2 × 2 model has not been examined in relation to negative repetitive thoughts.

Research to date examining psychological distress reveals robust relationships with socially prescribed perfectionism and pure evaluative concerns perfectionism. Although relationships are indicated with separate narrow perfectionism dimensions, procrastination and negative repetitive thought have not been examined in relation to the 2 × 2 model. Similar to the research focusing on adaptive outcomes, prior studies rely on cross-sectional designs and concurrent assessment. Longitudinal designs are relevant to determine maladaptive outcomes related to perfectionism in academic contexts. Additionally, it may be beneficial to examine how adaptive outcomes can be enhanced and maladaptive outcomes minimized for perfectionistic students.

Mindfulness

Mindfulness involves "bringing one's complete attention to the present experience on a moment-to-moment basis" (Marlatt & Kristellar, 1999, p. 68). Furthermore, it is described as a process that directs attention to current stimuli in an accepting and non-judgmental way (Brown & Ryan, 2003). The construct of mindfulness is associated with ameliorating psychological distress and maintaining one's well-being (Kabat-Zinn, 1994). Although this technique originated from Eastern meditation traditions, in recent decades it has been incorporated into many interventions used for various psychological and medical complaints, such as depression, anxiety, chronic physical health problems, personality disorders, substance abuse, eating disorders, and brain injuries (Bédard et al., 2012; Keng, Smoski, & Robins, 2011). Mindfulness is also discussed in the context of positive psychology, as a potential method to increase well-

being and enhance existing strengths (Slade, 2010). Studies indicate that mindfulness training outside of psychotherapy increases subjective well-being, and when taught to university students, improvements in mood, sleep, and self-regulation are the result (Caldwell, Harrison, Adams, Quin, & Greeson, 2010; Canby, Cameron, Calhoun, & Buchanan, 2014; Short, Mazmanian, Ozen, & Bédard, 2015). Even brief mindfulness training, consisting of only two to five classes, leads to reductions in stress, depression, anxiety, anger, and fatigue (Ditto, Eclache & Goldman, 2006; Tang et al., 2007).

Role of Mindfulness in Perfectionism

Theory and research suggests that mindfulness may help enhance adaptive outcomes and minimize maladaptive outcomes related to perfectionism. Early conceptualizations of perfectionism characterize the personality construct with cognitive errors, such as dichotomized thinking, overgeneralization, and "should" systems (Beck, 1976; Burns, 1980). However, some research suggests that cognitive distortions related to perfectionism are resistant to change (Blatt & Zuroff, 2002). Additionally, maladaptive perfectionism is related to decreased levels of self-acceptance (Flett, Besser, Davis, & Hewitt, 2003; Lundh, 2004). Thus, mindfulness training, with its focus on the acceptance of internal and external stimuli, may be a better approach to targeting perfectionism.

Rather than attempting to change levels of perfectionism, training of present-moment awareness, acceptance, non-judgment, and non-reactivity, could enhance or minimize the outcomes related to perfectionism. For instance, acceptance and non-judgment may help perfectionists disengage from cycles of negative repetitive thought by accepting when they fall short of their standards. Furthermore, present-moment awareness may enhance one's ability to self-monitor and encourage the self-regulation of

goal-directed behaviours. Mindfulness training, with its clear emphasis on acceptance, could be a promising approach in maintaining healthy student populations.

Previous research investigated the relationships between dispositional levels of mindfulness, perfectionism, and related maladaptive outcomes (Short & Mazmanian, 2013). The findings suggested that both worry and rumination underlie the link between socially prescribed perfectionism and negative affect. A multiple mediator model was examined in both a low dispositional mindfulness group and a high dispositional mindfulness group, to offer preliminary evidence towards the role of mindfulness in maladaptive perfectionism. The high dispositional mindfulness group had lower levels of socially prescribed perfectionism, negative repetitive thought, and psychological distress compared to the low dispositional mindfulness group. Additionally, when the mediation model was examined in the high mindfulness group, the mediating effect of rumination was not present. Thus, mindfulness skills may have a useful role in reducing the maladaptive outcomes of socially prescribed perfectionism, by decreasing the effects of rumination. Moreover, dispositional mindfulness is moderately and positively related to many adaptive outcomes, including self-regulation and achievement (Howell & Buro, 2011). A recent pilot study examining mindfulness training in psychology graduate students indicated enhanced levels of mindfulness and self-regulation skills after four sessions (Short et al., 2015). Employing a training program for undergraduate students could test the effects of mindfulness on enhancing adaptive outcomes and minimizing maladaptive outcomes associated with perfectionism.

Current Investigation

Prior studies examining the adaptiveness versus and maladaptiveness of perfectionism contributed many novel findings to the personality literature. However, many studies focus only on adaptive outcomes or only on maladaptive outcomes and employ cross-sectional designs. Some authors argue that longitudinal studies are needed to determine whether perfectionism is related to subsequent adaptive or maladaptive outcomes once individuals do not "perfectly" attain their goals (Hewitt & Flett, 2007). The current investigation consists of two studies. Study 1 examines whether perfectionism combinations predict adaptive outcomes (i.e., subjective well-being, achievement, and motivation) and maladaptive outcomes (i.e., psychological distress, procrastination, and negative repetitive thought) over an academic semester. Study 2 examines whether these relationships change overtime through mindfulness training.

STUDY 1

Research suggests that the dimensions of perfectionism are moderately and positively correlated, yet can be related to different outcomes (Stoeber, 2012). Moreover, although research has examined perfectionism in relation to various adaptive (e.g., positive affect, motivation) and maladaptive outcomes (e.g., negative affect, depression), inconsistencies regarding the adaptiveness versus maladaptivess of these dimensions still plague the literature. One potential reason for these inconsistencies may be due to the fact that the perfectionism dimensions are often investigated in isolation, rather than examining the interaction between dimensions. The 2 × 2 model addresses this issue by presenting a conceptual framework that encompasses all possible combinations of

personal standards and evaluation concerns (i.e., pure personal standards perfectionism, pure evaluative concerns perfectionism, mixed perfectionism, non-perfectionism).

The 2 × 2 model may be considered more comprehensive than the tripartite model, as this model only consists of three perfectionism combinations (i.e., healthy perfectionism, unhealthy perfectionism, and non-perfectionism). Although the combinations of the tripartite model and the 2 × 2 model were previously described (see General Introduction), it is relevant to highlight the commonalities and differences between these theoretical frameworks. The main commonality between the models is that pure personal standards perfectionism of the 2 × 2 model overlaps with healthy perfectionism of the tripartite model (i.e., high PSP/low ECP). Both models suggest that this combination is the most adaptive form of perfectionism.

There are two main differences between the 2 × 2 model and the tripartite model of perfectionism. First, the tripartite model conceptualizes that both non-perfectionism of the 2 × 2 model (i.e., low ECP/low PSP) and pure evaluative concerns perfectionism of the 2 × 2 model (i.e., high ECP/low PSP) are non-perfectionism. Therefore, if an individual does not have high personal standards, regardless of whether they have high evaluative concerns, they are not considered a perfectionist. Second, the tripartite model defines unhealthy perfectionism as the combination of high evaluative concerns perfectionism and high personal standards perfectionism, rather than classifying this combination as a mixed profile of perfectionism as seen in the 2 × 2 model (Gaudreau & Thomson, 2010). The 2 × 2 model describes mixed perfectionism (i.e., high PSP/high ECP) as less maladaptive than pure evaluative concerns (i.e., low PSP/high ECP). Therefore, the 2 × 2 model suggests that high personal standards buffer the effects of

evaluative concerns, while the tripartite model conceptualizes high personal standards to exacerbate the effects of evaluative concerns (i.e., high PSP/high ECP is more maladaptive than low PSP/high ECP; Stoeber & Otto, 2006).

The 2 × 2 model was originally validated in relation to various academic-related outcomes among students, including self-determined motivation, academic satisfaction, positive affect, negative affect, and academic goal progress (see findings described in the general introduction; Gaudreau & Thompson, 2010). Since then, only a few studies have examined this model in academic contexts. Franche and colleagues (2012) investigated the hypotheses of the 2 × 2 model among Asian Canadians and European Canadians. Narrow perfectionism dimensions were used (i.e., self-oriented perfectionism and socially-prescribed perfectionism) and the results supported most of the hypotheses. Specifically, non-perfectionism was associated with lower GPA scores than pure self-oriented perfectionism (hypothesis 1a of the 2 × 2 model), but with higher GPA scores than pure socially prescribed perfectionism (hypothesis 2 of the 2 × 2 model). The findings from this study also indicated that mixed perfectionism was related to higher GPA scores than pure socially prescribed perfectionism (hypothesis 3 of the 2 × 2 model), but to similar GPA scores as pure self-oriented perfectionism (i.e., disproving hypothesis 4 of the 2 × 2 model). Furthermore, cross-cultural differences were found in academic satisfaction, such that all four hypotheses of the 2 × 2 model were supported among European Canadians; however, only hypothesis 1a (i.e., pure self-oriented perfectionism is more adaptive than non-perfectionism) and hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure socially prescribed perfectionism) of the 2 × 2 model were supported among Asian Canadians (Franche et al., 2012). Another study,

conducted in China, examined performance outcomes in a work rather than academic context (Li, Hou, Chi, Liu, & Hager, 2014). The 2 × 2 model was examined among IT employees in relation to job burnout and the findings supported hypotheses 1a (i.e., pure PSP is less maladaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., mixed perfectionism is more maladaptive than pure PSP), but did not support hypothesis 3 (i.e., the findings indicated that mixed perfectionism and pure ECP did not differ in job burnout; Li et al., 2014).

Although the 2 × 2 model was originally tested in relation to academic outcomes (Gaudreau & Thompson, 2010), much of the growing research investigating the 2 × 2 model has been conducted in the areas of exercise and sport psychology. Overall, studies with dancers, soccer players, coaches, and mixed samples of athletes provide support for pure personal standards perfectionism as an adaptive perfectionism combination (hypothesis 1a of the 2 × 2 model; e.g., Cumming & Duda, 2012; Hill, 2013; Mallinson, Hill, Hall, & Gotwals, 2014), as well as a neutral combination (hypothesis 1c of the 2 × 2 model; e.g., Cumming & Duda, 2012; Gaudreau & Verner-Filon, 2012; Hill, 2013). The findings from this area also support the differentiation of pure evaluative concerns from non-perfectionism (hypothesis 2 of the 2 × 2 model; e.g., Gaudreau & Verner-Filon, 2012; Hill, 2013; Mallinson et al., 2014). Finally, the findings indicate that mixed perfectionism is more adaptive and less maladaptive than pure evaluative concerns perfectionism (hypothesis 3 of the 2 × 2 model; e.g., Gaudreau & Verner-Filon, 2012; Hill, 2013; Mallinson et al., 2014), and less adaptive and more maladaptive than pure personal standards perfectionism (hypothesis 4 of the 2 × 2 model; e.g., Mallinson et al., 2014). Thus, there is much research suggesting that pure evaluative concerns

perfectionism and pure personal standards perfectionism capture expressions of perfectionism, beyond what is expressed in mixed perfectionism. Although the hypotheses of the 2 × 2 model are fully supported for some outcomes, such as positive sport experience and sport burnout, only partial support is received for other outcomes, including sport devaluation and body-related concerns (Cumming & Duda, 2014; Hill, 2013; Mallinson et al., 2014).

In terms of well-being outcomes, a recent study by Smith and colleagues (2014) examined combinations of perfectionism dimensions in relation to depression, anxiety, and stress among Canadian and Chinese university students. Findings indicated that mixed perfectionism (i.e., high PSP/high ECP) was more maladaptive than pure evaluative concerns perfectionism (i.e., low PSP/high ECP); thus, the authors suggested that these results support the tripartite model of perfectionism rather than the 2 × 2 model of perfectionism. Similarly, another study among university students indicated no support for hypothesis 3 of the 2 × 2 model (i.e., the results indicated that pure ECP and mixed perfectionism did not differ in outcomes); however, the findings did support hypothesis 2 of the 2 × 2 model (i.e., pure ECP is more maladaptive than non-perfectionism; Douilliez & Lefèvre, 2011). Therefore, some of the distinctions between the 2 × 2 model and tripartite model are theoretically and empirically relevant (e.g., not describing low PSP/high ECP as non-perfectionism), while other unique features of the 2 × 2 model are not consistently supported (i.e., high PSP/high ECP is less maladaptive than low PSP/high ECP). Notably, these studies solely examined maladaptive outcomes in students. Some researchers have suggested that the 2 × 2 model may successfully predict differences between perfectionism combinations in terms of adaptive outcomes, but may

not adequately account for differences, or lack of differences, between perfectionism combinations in maladaptive outcomes (Hill, 2013).

The findings from these different fields of psychology highlight the fact that differential effects of perfectionism combinations may exist among different cultures, ages, and outcomes. Less research has focused on adaptive outcomes among university students, which is the context in which the 2 × 2 model was originally developed. One way research can further the empirical support of the 2 × 2 model, specifically in university students, is to investigate both adaptive and maladaptive outcomes and to go beyond cross-sectional research designs by examining predictive relationships.

Aims and Hypotheses of Study 1

The primary aim of Study 1 was to examine in what manner (i.e., main and interactive effects) perfectionism is related to adaptive outcomes (i.e., subjective well-being, achievement, and motivation) and maladaptive outcomes (i.e., psychological distress, negative repetitive thought, and procrastination) over an academic semester. That is, is the relationship between personal standards perfectionism and adaptive and maladaptive outcomes altered in the presence or absence of evaluative concerns perfectionism (or vice versa)? Given that mindfulness training may play a role in changing the outcomes of perfectionism, levels of mindfulness were also examined in relation to the 2 × 2 model. A secondary aim of this study was to examine why or how (i.e., indirect effects) perfectionism is related to adaptive and maladaptive outcomes. Possible mediators were explored in the relationships between perfectionism dimensions and subjective well-being, and perfectionism dimensions and academic-related outcomes.

Primary Hypotheses

Hypotheses regarding the 2 × 2 model of perfectionism are delineated from the conceptualization derived by Gaudreau and Thompson (2010), and supported by recent studies in academic and sport contexts (e.g., Franche et al., 2012; Mallinson et al., 2014).

Hypothesis 1a. Pure personal standards perfectionism predicts higher adaptive outcomes and lower maladaptive outcomes than non-perfectionism[2].

Hypothesis 1b. Non-perfectionism predicts lower adaptive outcomes and higher maladaptive outcome than pure personal standards perfectionism.

Hypothesis 1c. There are no differences between pure personal standards and non-perfectionism in terms of their relationships with adaptive and maladaptive outcomes.

Hypothesis 2. Pure evaluative concerns perfectionism is different from non-perfectionism and predicts higher maladaptive outcomes and lower adaptive outcomes.

Hypothesis 3. Mixed perfectionism predicts higher adaptive outcomes and lower maladaptive outcomes than pure evaluative concerns perfectionism.

Hypothesis 4. Pure personal standards perfectionism predicts higher adaptive outcomes and lower maladaptive outcomes than mixed perfectionism.

Secondary Hypotheses

Hypotheses regarding possible mediators are based on previous research examining the dimensions of perfectionism in relation to well-being and academic-related outcomes (e.g., Lo & Abbott, 2013; Short & Mazmanian, 2013):

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[2] It is relevant to note that Stoeber (2012) criticized hypothesis 1 of the 2 × 2 model for containing contradictory predictions. Given the existing mixed findings regarding the adaptiveness versus maladaptiveness of high personal standards, all three alternative hypotheses were evaluated in the current study. Gaudreau (2013) suggests that this approach aligns with an open-ended theoretical system that could incorporate boundary conditions in the future once this novel model is adequately evaluated.

Hypothesis 5. Negative repetitive thoughts mediate the relationship between evaluative concerns and negative affect, independent of personal standards.

Hypothesis 6. Self-regulation difficulties mediate the relationship between evaluative concerns and procrastination, independent of personal standards.

Hypothesis 7. Mindfulness mediates the relationship between personal standards and positive affect, independent of evaluative concerns.

Hypothesis 8. Motivation mediates the relationship between personal standards and academic goal achievement, independent of evaluative concerns.

Method

Participants

Inclusion criteria consisted of being enrolled in an undergraduate class at Lakehead University and being 18 years of age or older. The targeted sample size was $N = 300$ during participant recruitment, which allowed for potential incomplete responses and attrition, and was a realistic goal based on the study's online format. Of the 329 participants who completed Phase 1 of the study, 244 participants completed Phase 2 (74% completion rate). A measure of infrequency was included to detect carelessness or other non-purposeful responding. Three participants during Phase 1 and one participant during Phase 2 obtained a total score greater than the cut-off of four, and were removed from the analyses (Jackson, 1984). Furthermore, five participants completed Phase 1 outside of the study time frame (i.e., first 35 days of the academic semester) and one participant completed Phase 2 outside of the study time frame (i.e., last 35 days of the academic semester) and these participants were also removed from the analyses. Bivariate correlations revealed that those who completed Phase 2 did not differ on any of

the study variables compared to those who did not complete Phase 2 (*p*s > .05). Demographic characteristics of the final sample (i.e., successfully screened completers of both Phase 1 and 2; *N* = 240) are presented in Table 1, and are consistent with other student samples recruited from Lakehead University (Short & Mazmanian, 2013).

Measures

To evaluate the relationships among perfectionism and adaptive and maladaptive outcomes, a number of self-report instruments were completed twice over the academic semester during two data collection periods. The instruments included: a demographic information form, and measures of: (1) perfectionism, (2) mindfulness (3) adaptive outcomes (i.e., positive affect, satisfaction with life, self-regulation, motivation, academic average, satisfaction with average, and academic goal achievement, (4) maladaptive outcomes (i.e., negative affect, depression, anxiety, stress, worry, rumination, and procrastination), (5) social desirability, and (6) infrequency. A "past few weeks" time frame was used for all of the outcome measures to be consistent with the short-term longitudinal nature of the study. This time frame has been used in similar longitudinal designs (Mackinnon et al., 2011). Since perfectionism is conceptualized and empirically supported as a stable construct, a long-term time frame (i.e., "generally") was used for those measures. Higher scores indicate higher levels of the construct for each measure.

Demographic Information Form. The Demographic Information Form (Appendix A) was developed for this study to capture the distribution of demographic characteristics in the study sample. Participants were asked to provide information on their age, sex, sexual orientation, ethnicity, locality, relationship status, employment status, annual family income, education, and mental health.

Table 1

Demographic Characteristics of Study 1 Final Sample (N = 240)

Variable	Mean (*SD*) / *n* (Frequency)
Age (years)	21.98 (5.60)
Sex (female)	208 (86.7%)
Sexual Orientation (exclusively heterosexual)	206 (85.8%)
Primary Ethnicity (white)	219 (91.3%)
Where From	
City (10, 000 or more)	173 (72.1%)
Town (1,000 – 9, 999)	48 (20.0%)
Village (100 – 999)	19 (7.9%)
Marital Status	
Married	15 (6.3%)
Common Law	2 (0.8%)
Divorced/Separated	0 (0.0%)
Committed Relationship	115 (47.9%)
Single	108 (45.0%)
Employment Status	
Full-Time	19 (7.9%)
Part-Time	137 (57.1%)
Unemployed	83 (34.6%)
Annual Family Income	
$0 – $19, 999	41 (17.1%)
$20, 000 – $39, 999	20 (8.3%)
$40, 000 – $59, 999	26 (10.8%)
$60, 000 – $79, 999	40 (16.7%)
$80, 000 – $99, 999	22 (9.2%)
$100, 000 – $119, 999	27 (11.3%)
$120, 000 – $139, 999	18 (7.5%)
$140, 000 – $159, 999	16 (6.7%)
$160, 000 – $179, 999	11 (4.6%)
$180, 000 – $199, 999	7 (2.9%)
greater than $200, 000	8 (3.3%)
Educational Status (Full-Time)	212 (88.3%)
Year of University	
First	67 (27.9%)
Second	58 (24.2%)
Third	58 (24.2%)
Fourth	51 (21.3%)
Fifth or more	6 (2.5%)
Diagnosed with Psychological Condition (Yes)	38 (15.8%)
Receiving Treatment for Psychological Condition	
Counselling/ Therapy	12 (5.0%)
Medication	17 (7.1%)

Perfectionism Measures

Multidimensional Perfectionism Scale (MPS-HF; Hewitt & Flett, 1991). The MPS-HF (Appendix B) is a 45-item self-report measure of perfectionism, based on the conceptualization of perfectionism by Hewitt and Flett (1991). This measure incorporates both intrapersonal and interpersonal aspects of perfectionism, with 15 questions assessing each of the three narrow dimensions. The subscales include self-oriented (e.g., "One of my goals is to be perfect in everything that I do"), other-oriented (e.g., "If I ask someone to do something, I expect it to be done flawlessly"), and socially prescribed (e.g., "The people around me expect me to succeed at everything that I do"; Hewitt & Flett, 1991). Participants rate their responses on a seven-point Likert scale, ranging from one (strongly disagree) to seven (strongly agree). The validity and reliability of the MPS-HF has been well established in both clinical and non-clinical populations. Test-retest reliability over a three-month period is high for the self-oriented, other-oriented, and socially prescribed subscales (r = .88, .85, .75, respectively; Hewitt & Flett, 1991). Cronbach's alphas for the self-oriented, other-oriented, and socially prescribed subscales are .91, .85, .78, respectively (O'Conner, O'Connor, & Marshall, 2007). Studies support the validity of the MPS-HF. The MPS-HF subscales correlate strongly with measures of personal standards and self-criticism (rs = .42 to .75, $p < .05$; Hewitt & Flett, 1991).

Multidimensional Perfectionism Scale (MPS-F; Frost et al., 1990). The MPS-F (Appendix C) is a 35-item self-report measure of perfectionism, based on the conceptualization of perfectionism by Frost and colleagues (1990). This measure assesses six dimensions: personal standards (e.g., "I set higher goals than most people"), concern over mistakes (e.g., "The fewer mistakes I make, the more people will like me"), parental

expectations (e.g., “My parents have expected excellence from me”), parental criticism (e.g., “My parents never tried to understand my mistakes”), doubts about actions (e.g., “I usually have doubts about the simple everyday things I do”) and organization (e.g., “Neatness is very important to me”). Items are rated on a five-point Likert-type scale ranging from one (strongly disagree) to five (strongly agree). Cronbach’s alphas for the subscales range from .77 to .93, and the subscales correlate strongly with other measures of perfectionism, such as Burns’ Perfectionism Scale (r = .85; Frost et al., 1990).

Adaptive Outcome Measures

Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The FFMQ (Appendix D) is a 39-item measure of mindfulness and is comprised of a total score and five subscales. The subscales include observing (e.g., “When I’m walking, I deliberately notice the sensations of my body moving”), describing (e.g., “I’m good at finding words to describe my feelings”), acting with awareness (e.g., “I find it difficult to stay focused on what’s happening in the present”; reverse scored), non-judging of inner experience (e.g., “I believe that some of my thoughts are abnormal or bad and I shouldn’t think that way”; reverse scored), and non-reactivity to inner experience (e.g., “I perceive my feelings and emotions without having to react to them”; Baer et al., 2006). Participants rate their responses on a five-point Likert-type scale, ranging from one (never true) to five (always true). The reliability and validity of the FFMQ is established. Cronbach’s alphas for the five subscales range from .72 to .92 (Baer et al., 2008). Additionally, the five facets correlate as expected to other measures of mindfulness (e.g., Mindful Attention Awareness Scale), and measures of well-being (Baer et al, 2008).

Brief Multidimensional Students' Life Satisfaction Scale – College Version (SLSS-C; Zullig et al., 2009.). The SLSS-C (Appendix E) is an 8-item self-report measure consisting of one item for each of the seven domains of life satisfaction (i.e., family, friends, school, self, living environment, romantic relationships, and physical appearance), and one item for global life satisfaction (e.g., "I would describe my satisfaction with my overall life as"). Participants are asked to respond based on a seven-point Likert-type scale, ranging from one (terrible) to seven (delighted). This measures is determined to be reliable and valid in university students, and Cronbach's alphas cluster around .80 (Zulli et al., 2009; Zullig, Teoli, & Ward, 2011).

Positive and Negative Affect Schedule – Positive Affect (PANAS-PA; Watson, Clark, & Tellegen, 1988). The PANAS (Appendix F) is a 20-item scale that was developed as a self-report instrument designed to measure positive affect (PANAS-PA; e.g., "Excited") and negative affect (PANAS-NA; e.g., "Irritable"). The positive affect scale of the PANAS was employed in this study as an adaptive outcome measure. Items are administered using a five-point Likert-type scale ranging from one (very slightly) to five (extremely). The PANAS-PA scale has an internal consistency of .89 (Crawford & Henry, 2004). Correlations among the PANAS-PA scale and the Depression Anxiety Stress Scales have ranged from -.30 to -.48 (Crawford & Henry, 2004).

Academic Average. Participants were asked to provide their current overall average[3] as a measure of academic achievement (Appendix G). In addition, participants were asked to rate their satisfaction with their average based on a five-point Likert-type scale ranging from one (very dissatisfied) to five (very satisfied).

[3]Academic average out of 100 is the grade point average displayed on transcripts at the university where the study was conducted.

Academic Goal Achievement. Goal progress and attainment was measured during each data collection period, using three items: "to what extent have you attained this goal", "to what extent have you made progress in the pursuit of this goal", and "to what extent are you satisfied with the progress made in the pursuit of this goal" (Appendix G). Participants were asked to indicate their two most important academic goals for the semester during Phase 1, and were reminded of their goals during Phase 2. Participants were asked to respond using a nine-point Likert-type scale ranging from one (not at all) to nine (totally). Ratings were made separately for each of the two goals and then summated across ratings and across goals. These items have been employed in previous research to measure academic goal achievement and indicate an internal consistency of .90 (Gaudreau & Thompson, 2010).

Self-Control Self-Management Scale (SCMS; Mezo, 2009). The SCMS (Appendix H) is a 16-item self-report measure of self-regulation, comprised of three subscales: self-monitoring (e.g., "When I am working towards something, it gets all of my attention"), self-evaluation (e.g., "I make sure to track my progress regularly when I am working on a goal"), and self-reinforcement (e.g., "I congratulate myself when I make some progress"). Participants report how well the items describe them on a six-point Likert-type scale, ranging from zero (very undescriptive of me) to five (very descriptive of me). Cronbach's alphas for the total score and self-monitoring, self-evaluation, and self-reinforcement subscales are .81, .74, .75, and .78, respectively (Mezo, 2009). Test-retest reliabilities range from .62 to .65 (Mezo, 2009). The validity of the SCMS is demonstrated in prior studies (Mezo & Short, 2012). The total scale and subscales

correlate strongly with the Self-Control Questionnaire and the Self-Control Schedule, with correlations ranging from .30 to .65.

Academic Motivation Scale – College Version (AMS; Vallerand et al., 1992). The AMS (Appendix I) is a 28-item self-report instrument, measuring academic motivation by asking participants "why do you go to university?" The measure consists of seven subscales that are combined to form three scales: intrinsic motivation (e.g., "Because I experience pleasure and satisfaction while learning new things"), extrinsic motivation (e.g., "Because I think that a university education will help me better prepare for the career I have chosen"), and amotivation (e.g., "Honestly, I don't know; I really feel like I am wasting my time in school"). Participants respond based on a seven-point Likert-type scale, ranging from one (does not correspond at all) to seven (corresponds exactly). Cronbach's alphas for the subscales range from .62 to .91, and the three-factor structure is supported (α = .81-.89; Vallerand et al., 1992). Test-retest correlations over a two-week period range from .71 to .83. The AMS positively correlates with other measures of motivation (Vallerand et al., 1992).

Assessment of Maladaptive Outcomes

Depression Anxiety Stress Scales – 21 (DASS-21; Antony, Bieling, Cox, Enna, & Swinson, 1998). The DASS-21 (Appendix J) is a 21-item self-report measure that yields three factors: depression (e.g., "I felt I wasn't worth much as a person"), anxiety (e.g., "I felt I was close to panic"), and stress (e.g., "I found it hard to wind down"). Participants respond based on a four-point Likert-type scale (0 = did not apply to me at all, 3 = applied to me very much). Cronbach's alphas range from .82 to .90 for the three scales (Henry & Crawford, 2005). Moreover, the scales of the DASS-21 correlate

positively with measures of negative affect, and negatively with measures of positive affect (Henry & Crawford, 2005).

Positive and Negative Affect Schedule – Negative Affect (PANAS-NA; Watson et al., 1988). The negative affect subscale of the PANAS was employed as a maladaptive outcome measure (Appendix F). Details regarding the format of the PANAS-NA are presented in the prior description of this measure. Cronbach's alpha for the PANAS-NA subscale is .85 (Crawford & Henry, 2004). Correlations among the PANAS-NA scale and the Depression Anxiety Stress Scale range from .60 to .67 (Crawford & Henry, 2004).

Irrational Procrastination Scale (IPS; Steel, 2002; 2010). The IPS (Appendix K) is a 9-item measure based on the conceptualization that procrastination is an irrational delay (e.g., "My life would be better if I did some activities or tasks earlier"; Steel, 2002; 2010). Participants respond based on a one to five-point Likert-type scale ranging from one (not [or very seldom] true) to five (very often [or always] true). Cronbach's alpha for the IPS is .91 and the scale correlates positively with other measures of procrastination, and negatively with measures of well-being (Steel, 2010).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ (Appendix L) is a 16-item measure of worry (Meyer et al., 1990). Participants rate items on a one to five point Likert-type scale ranging from "not at all typical of me" to "very typical of me" (e.g., "As soon as I finish one task, I start to worry about everything else I have to do"). Test-retest reliabilities range from .74 to .93, with re-test periods of 2 to 10 weeks (Molina & Borkovec, 1994). Cronbach's alphas range from .80 to .95 (Brown, Anthony, & Barlow, 1992). The PSWQ correlates strongly

with other measures of worry, and measures of anxiety and depression (Segerstrom, Tsao, Alden, & Craske, 2000; van Rijsoort, Emmelkamp, & Vervaeke, 1999).

Ruminative Responses Scale - Brooding (RRS; Treynor et al., 2003). Rumination was assessed using a 10-item version of the Ruminative Responses Scale that was developed by Nolen-Hoeksema and Marrow (1991; Appendix M). This instrument excludes items of the RRS that measure depressive symptoms, rather than rumination, to eliminate conceptual overlap (Treynor et al., 2003). The 5-item brooding subscale was used as a measure of preoccupation with depressing, morbid, or painful memories or thoughts (e.g., "Think 'Why do I always react this way?'"). The items are rated on a Likert-type scale, ranging from zero (almost never) to three (almost always). Cronbach's alpha is .90 and test-re-test reliability over a one-year time span is .71 (Treynor et al., 2003). The RRS correlates strongly with measures of depression (Treynor et al., 2003).

Validity Measures

Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1988). The BIDR (Appendix N) measures self-deception (i.e., tendency to give favourably biased but honest self-descriptions) and impression management (i.e., tendency to give favourable self-descriptions in order to be perceived better by others; Paulhus, 1988). It was included as a measure of social desirability, with the purpose to control for response bias. The measure consists of 40 items rated on a seven-point Likert-type scale ranging from one (not true) to seven (very true). The BIDR is comprised of two subscales: self-deception (e.g., "I always know why I like things") and impression management (e.g., "I always obey laws, even if I'm unlikely to get caught"). Cronbach's alpha for the total scale is .83 and it correlates strongly with other measures of social desirability (Paulhus, 1988).

Personality Research Form – Infrequency Scale (PRF – IN; Jackson, 1984). The Infrequency Scale of the PRF was included to identify carelessness or other non-purposeful responding (Appendix O). It consists of 16 true-false items (e.g., "I have never had any hair on my head") that were divided to appear at the beginning, middle, and end of the questionnaire batteries. Scores greater than four indicate responses that are implausible or pseudo-random in manner, possibly due to carelessness, poor comprehension, passive non-compliance, confusion, or gross deviation (Jackson, 1984).

Procedure

Lakehead University's Research Ethics Board reviewed and approved the current study (Appendix P). The researcher visited undergraduate classes and orally informed students of the opportunity to participate in research that investigates "how personality relates to well-being and academic-related outcomes" (Appendix Q). The same information was provided in written format to students enrolled in online classes or where with the instructor preferred email correspondence. Participants were presented with an incentive of two bonus marks for participating in the study. One bonus mark was given for completing Phase 1 and the second bonus mark was given for completing Phase 2. Participants were asked to provide their name and email address to complete the Phase 2 questionnaire battery (Appendix R); however, contact information was destroyed after completion of this follow-up battery. All data were coded with a number and not associated with contact information. The students were given an information letter (Appendix S), which included a website to access if they wished to participate.

Participants completed the Phase 1 questionnaire battery during the first month (i.e., 35 days) of the academic semester. Approximately two months later, during the last

month (i.e. 35 days) of the semester, participants completed the Phase 2 questionnaire battery. On average, Phase 2 occurred 60.36 days after Phase 1 (*SD* = 2.77; range = 55 to 67). Bivariate correlations indicated that the length of time between Phase 1 and Phase 2 was not correlated with any of the study variables. Both questionnaire batteries were completed through a secured website service (i.e., SurveyMonkey). Participants first read a consent form (Appendix T) and indicated consent before continuing to the questionnaire battery. The demographic information form appeared at the beginning of the battery. The questionnaires were in a consistent order for each participant. Each questionnaire battery took approximately 60 minutes to complete. A debriefing form (Appendix U) was presented at the end of each battery.

Results

Data Screening

Non-significant Little's MCAR tests indicated that missing data were missing completely at random at Phase 1 and Phase 2 ($p > .05$; Little, 1988). A single imputation using the expectation maximization algorithm provides unbiased parameter estimates comparable to multiple imputation and improves statistical power when data are missing completely at random and less than 5% of the data are missing overall (Scheffer, 2002). Moreover, the Hayes and Preacher's (2014) mediation macro supports single imputation. Given that less than 1% of values were missing for Phase 1 and Phase 2, an expectation maximization algorithm in SPSS 22.0 was used to impute missing data.

Skewness and kurtosis for all scales and subscales were within acceptable limits (Tabachnick & Fidell, 2007). Following recommendations by Tabachnick and Fidell (2007), outliers were screened by examining scores above or below three standards

deviations from the total scale mean. Scores three standard deviations above the mean were replaced with one value higher than the highest score that was not an outlier, while scores three standard deviations below the mean were replaced with one value lower than the lowest score that was not an outlier. Nine outliers were replaced. The study scales were examined in relation to a measure of social desirability. Bivariate correlations indicated that some of the study instruments were significantly correlated with the BIDR and its subscales (*r*s = .08 to .40); however, the effect sizes associated with the intercorrelations between the study instruments remained when controlling for the BIDR scores. Therefore, social desirability was not controlled for in the subsequent analyses.

Type I and II Error Rates and Effect Sizes

Given the multiple analyses planned for Study 1, a number of options were considered to address the potential for a high Type I error rate. Specifically, a Bonferroni correction was considered to reduce the potential of Type I error in the correlation and hierarchical regression analyses; however, this approach is often considered too stringent for testing a priori hypotheses and can result in false negatives (Scheirs, 1992). Thus, test statistics are evaluated at both the .05 and .01 alpha levels. Additionally, effect sizes are emphasized and described according to Cohen's (1992) guidelines: $r = .10$ or $R^2 = .01$ suggests a small effect, $r = .30$ or $R^2 = .09$ suggests a medium effect, and $r = .50$ or $R^2 = .25$ suggests a large effect. The bootstrapped procedure for testing mediation controls Type I error (Hayes & Preacher, 2014); thus, no additional corrections were considered.

Descriptive Statistics, Reliability, and Validity of Study Instruments

The scale characteristics of the measures of perfectionism and adaptive and maladaptive outcomes were investigated. Descriptive statistics and reliability estimates

are presented in Table 2. The internal consistencies of the measures were estimated using coefficient alphas, and are all above the acceptable threshold of .70 (Nunnally, 1978). In terms of the overall level of distress in the student sample, the DASS-21 mean scores for the depression and stress scales are in the normal severity range and the mean score for the anxiety scale is in the mild severity range based on a five-point classification system (i.e., normal – mild – moderate – severe – extremely severe; Anthony et al., 1998).

Relationships between Perfectionism and Adaptive and Maladaptive Outcomes

Pre-analyses. To assess the broad dimensions of evaluative concerns perfectionism and personal standards perfectionism, separate composite measures were created. Raw scores from the socially prescribed perfectionism subscale of the MPS-HF, and the concerns over mistakes, doubts about actions, parental criticisms, and parental expectations subscales of the MPS-F were converted to z-scores and summed to calculate the composite score of evaluated concerns perfectionism. Next, raw scores from the self-oriented perfectionism subscale of the MPS-HF and the personal standards subscale of the MPS-F were converted to z-scores and summed to calculate the composite score of personal standards perfectionism. Previous research supports the combination of these subscales (λs = .57-.92; Gaudreau & Thompson, 2010). Furthermore, principle components factor analyses supported a two-factor solution in the present sample. Standardized scores, rather than factor scores, were used in the subsequent analyses to reduce multicollinearity in the hierarchical regressions and for consistency throughout the analyses. Reliability estimates indicated high internal consistencies of the evaluative concerns and personal standards composites in this sample (α = .86 and .83, respectively).

Table 2

Descriptive Statistics and Reliability Estimates of Study 1 Instruments at Both Phases

	Mean	*SD*	Potential Range	Actual Range	Coefficient alpha
Perfectionism Measures					
Self-Oriented Phase 1	71.50	14.38	15 – 105	34 – 105	.89
Socially Prescribed Phase 1	52.80	13.06	15 – 105	18 – 96	.85
Personal Standards Phase 1	23.92	5.22	7 – 35	8 – 35	.80
Concerns About Mistakes Phase 1	22.00	8.11	9 – 45	9 – 45	.92
Parental Expectations Phase 1	13.99	4.81	5 – 25	5 – 25	.85
Parental Concerns Phase 1	8.46	3.98	4 – 20	4 – 20	.86
Doubts About Actions Phase 1	11.41	3.73	4 – 20	4 – 20	.78
Adaptive Outcomes					
FFMQ Mindfulness Phase 1	123.08	13.29	39 – 195	86 – 160	.88
Academic Average Phase 1	77.64	7.90	0 - 100	53 – 100	--
Satisfaction with Average Phase 1	3.17	1.21	1 – 5	1 – 5	--
Goal Achievement Phase 1	34.77	9.54	6 – 54	6 – 54	.85
SCMS Self-Regulation Phase 1	53.56	11.12	0 – 80	20 – 78	.87
AMS Intrinsic Motivation Phase 1	54.60	13.11	12 – 84	15 – 84	.91
AMS Extrinsic Motivation Phase 1	67.74	10.81	12 – 84	34 – 84	.89
AMS Amotivation Phase 1	6.95	4.13	4 – 28	4 – 21	.90
BMSLSS Life Satisfaction Phase 1	5.50	1.15	1 – 7	2 – 7	--
PANAS Positive Affect Phase 1	33.35	7.21	10 – 50	16 – 49	.89
FFMQ Mindfulness Phase 2	123.88	18.79	39 – 195	67 – 177	.88
Academic Average Phase 2	76.28	7.80	0 – 100	55 – 96	--
Satisfaction with Average Phase 2	3.16	1.07	1 – 5	1 – 5	--
Total Goal Achievement Phase 2	36.21	11.22	6 – 54	6 – 54	.89
SCMS Self-Regulation Phase 2	52.95	10.76	0 – 80	20 – 78	.87
AMS Intrinsic Motivation Phase 2	55.17	13.17	12 – 84	12 – 83	.92
AMS Extrinsic Motivation Phase 2	65.90	11.27	12 – 84	28 – 84	.89
AMS Amotivation Phase 2	7.93	5.07	4 – 28	4 – 24	.90
BMSLSS Life Satisfaction Phase 2	5.48	1.10	1 – 7	2 – 7	--
PANAS Positive Affect Phase 2	31.27	7.77	10 – 50	10 – 49	.91
Maladaptive Outcomes					
PANAS Negative Affect Phase 1	22.03	7.21	10 – 50	10 – 45	.88
IPS Procrastination Phase 1	26.47	6.92	9 – 45	12 – 45	.90
PSWQ Worry Phase 1	54.41	13.30	16 – 80	23 – 80	.93
RRS-B Rumination Phase 1	6.16	3.26	0 – 15	0 – 15	.82
DASS-21 Depression Phase 1	4.49	4.77	0 – 21	0 – 19	.92
DASS-21 Anxiety Phase 1	4.83	4.31	0 – 21	0 – 18	.84
DASS-21 Stress Phase 1	7.23	4.79	0 – 21	0 – 21	.88
PANAS Negative Affect Phase 2	21.65	7.27	10 – 50	10 – 44	.89
IPS Procrastination Phase 2	26.27	6.96	9 – 45	11 – 45	.90
PSWQ Worry Phase 2	53.57	13.27	16 – 80	24 – 80	.94
RRS-B Rumination Phase 2	5.55	3.26	0 – 15	0 – 15	.83
DASS-21 Depression Phase 2	4.68	4.54	0 – 21	0 – 20	.90
DASS-21 Anxiety Phase 2	4.78	4.14	0 – 21	0 – 20	.83
DASS-21 Stress Phase 2	7.27	4.55	0 – 21	0 – 21	.86

Bivariate correlations. Bivariate correlational analyses were employed to examine the relationships among evaluative concerns perfectionism and personal standards perfectionism at Phase 1, and the measures of adaptive and maladaptive outcomes at Phase 1 and Phase 2 (see Table 3). Given the longitudinal nature of Study 1, correlational findings are focused on Phase 2 outcomes.

Evaluative concerns perfectionism at Phase 1 generally correlated as expected with the adaptive and maladaptive outcome measures at Phase 2. With respect to the adaptive outcome measures, ECP was negatively correlated with goal achievement, satisfaction with academic average, mindfulness, self-regulation, life satisfaction, and positive affect. Small effects were found for the academic-related outcomes (i.e., goal achievement and satisfaction with academic average) and medium to large effects were calculated for self-regulation, mindfulness, and the subjective well-being outcomes (i.e., life satisfaction and positive affect). ECP was not correlated with academic average, intrinsic motivation, or extrinsic motivation. ECP was positively correlated with all of the maladaptive outcome measures, including amotivation, procrastination, worry, rumination, negative affect, depression, anxiety, and stress. Small effects were calculated for the academic-related outcomes (i.e., amotivation and procrastination) and medium effects were calculated for the well-being measures. A similar pattern of correlations was found between ECP and the outcomes at Phase 1.

Personal standards perfectionism at Phase 1 correlated as expected with many of the adaptive outcomes at Phase 2. PSP positively correlated with academic average, intrinsic motivation, and extrinsic motivation. PSP was not related to satisfaction with average, goal achievement, self-regulation, life satisfaction, and positive affect. PSP

positively correlated with many of the maladaptive outcomes, including worry, rumination, negative affect, depression, anxiety, and stress. All of the correlations between PSP and the adaptive and maladaptive outcomes at Phase 2 were small effects. A similar pattern of correlations was found between PSP and the outcomes at Phase 1.

Inter-correlations between the outcomes at Phase 1 (above diagonal) and inter-correlations between the outcomes at Phase 2 (below diagonal) were as expected, with the exception of academic average, intrinsic motivation, and extrinsic motivation. These measures did not correlate with some of the well-being outcomes (e.g., depression, anxiety, and stress), but did correlate as expected with other academic outcomes (e.g., satisfaction with average, goal achievement, procrastination, self-regulation).

Bivariate correlations were also conducted to examine the relationships between evaluative concerns perfectionism, personal standards perfectionism, and satisfaction with specific life domains. ECP was negatively correlated with life satisfaction in every domain, including small effects for friends (r = -.29, p < .01), school (r = -.28, p < .01), and romantic relationships (r = -.20, p < .01), and medium effects for family (r = -.40, p < .01), self (r = -.43, p < .01), environment (r = -.35, p < .01), and physical appearance (r = -.43, p < .01). Partial correlation analyses indicated that this pattern of results between ECP and the life domains remained when PSP was entered as a control variable. PSP did not correlate with any domains, except for small negative correlations with self (r = -.16, p < .05) and physical appearance (r = -.22, p < .01) domains. Partial correlation analysis indicated that PSP was no longer negatively correlated with any of the life domains when ECP was entered as a control variable; in fact, PSP was positively correlated with the domains of family (pr = .16, p < .05) and environment (pr = .15, p < .05).

Table 3

Bivariate Correlations Between Measures at Both Phases

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. ECP Evaluative Concerns	**.85****	.53**	-.40**	-.03	-.30**	-.28**	-.43**	-.09	.12	.28**	-.51**	-.30**	.44**	.41**	.39**	.45**	.45**	.45**	.48**
2. PSP Personal Standards		**.85****	.02	.20**	-.10	-.09	.09	.14*	.19**	.03	-.20**	.01	.23**	.04	.29**	.27**	.26**	.27**	.33**
3. FFMQ Mindfulness	-.50**	-.16*	**.82****	.16*	.22**	.28**	.58**	.26**	-.02	-.12	.39**	.43**	-.35**	-.39**	-.19**	-.40**	-.37**	-.25**	-.35**
4. Academic Average	-.08	.22**	.09	**.79****	.61**	.04	.16*	.01	-.17*	-.09	-.02	.04	.08	-.18**	.12	-.06	.01	-.05	-.02
5. Satisfaction with Average	-.26**	-.08	.24**	.59**	**.71****	.35**	.30**	.06	-.07	-.17*	.27**	.22**	-.12	-.29**	-.14*	-.21**	-.24**	-.25**	-.23**
6. Goal Achievement	-.20**	-.04	.33**	.17*	.38**	**.46****	.41**	.10	.03	-.15*	.30**	.32**	-.31**	-.34**	-.20**	-.18**	-.32**	-.19**	-.27**
7. SCMS Self-Regulation	-.38**	.09	.64**	.19**	.34**	.45**	**.74****	.38**	.23**	-.32**	.58**	.58**	-.39**	-.54**	-.26**	-.31**	-.50**	-.30**	-.34**
8. AMS Intrinsic Motivation	-.01	.20**	.24**	.04	.04	.17**	.30**	**.62****	.38**	-.21**	.25**	.39**	-.13*	-.26**	-.13*	-.05	-.22**	-.07	-.11
9. AMS Extrinsic Motivation	.06	.21**	.01	-.09	.02	.05	.24**	.43**	**.63****	-.21**	.09	.20**	.05	-.08	.11	.21**	-.04	.06	.07
10. AMS Amotivation	.26**	.09	-.19**	-.14*	-.24**	-.26**	-.33**	-.01	-.11	**.61****	-.35**	-.22**	.28**	.30**	.17*	.22**	.50**	.29**	.33**
11. SLSS Life Satisfaction	-.49**	-.11	.55**	.08	.37**	.35**	.60**	.19**	.18**	-.27**	**.77****	.60**	-.54**	-.40**	-.45**	-.48**	-.66**	-.49**	-.57**
12. PANAS Positive Affect	-.31**	-.02	.51**	.02	.22**	.42**	.56**	.25**	.13	-.20**	.58**	**.66****	-.33**	-.44**	-.41**	-.31**	-.52**	-.31**	-.42**
13. PANAS Negative Affect	.42**	.18**	-.54**	-.16*	-.24**	-.29**	-.45**	-.06	-.01	.33**	-.51**	-.31**	**.67****	.39**	.56**	.56**	.68**	.64**	.71**
14. IPS Procrastination	.29**	.01	-.46**	-.12	-.15*	-.46**	-.49**	-.19**	.00	.23**	-.32**	-.46**	.33**	**.77****	.40**	.46**	.49**	.35**	.49**
15. PSWQ Worry	.38**	.29**	-.53**	.01	-.16*	-.30**	-.30**	-.10	.13	.15*	-.38**	-.43**	.56**	.29**	**.78****	.59**	.53**	.54**	.63**
16. RRS-B Rumination	.36**	.17**	-.52**	-.19**	-.33**	-.32**	-.37**	-.05	.19**	.26**	-.46**	-.41**	.51**	.41**	.59**	**.64****	.59**	.58**	.70**
17. DASS-21 Depression	.46**	.20**	-.57**	-.08	-.32**	-.39**	-.56**	-.09	-.06	.47**	-.59**	-.53**	.60**	.46**	.45**	.64**	**.66****	.69**	.76**
18. DASS-21 Anxiety	.47**	.23**	-.44**	-.15*	-.29**	-.30**	-.43**	.04	.06	.35**	-.51**	-.34**	.62**	.31**	.42**	.53**	.67**	**.67****	.78**
19. DASS-21 Stress	.42**	.28**	-.57**	-.12	-.27**	-.37**	-.46**	-.03	.03	.35**	-.56**	-.43**	.69**	.39**	.58**	.63**	.76**	.75**	**.70****

Note. Inter-correlations between Phase 1 and Phase 2 measures are bolded and underlined. Bivariate correlations with Phase 1 ECP and PSP and Phase 1 outcomes are above the diagonal and shaded grey. The remaining bivariate correlations above the diagonal are inter-correlations between the Phase 1 outcomes. Bivariate correlations with Phase 1 ECP and PSP and Phase 2 outcomes are below the diagonal and shaded grey. The remaining bivariate correlations below the diagonal are inter-correlations between the Phase 2 outcomes.

**p <. 05; *p < .01.

Moderation Analyses: Testing the 2 × 2 Model of Perfectionism

Pre-analyses. This study explored the 2 × 2 model using a longitudinal design. To first determine whether the adaptive and maladaptive outcomes changed from the beginning of the semester to the end of the semester paired *t*-tests comparing Phase 1 and Phase 2 means were conducted (see Table 4).

The results indicated that over two thirds of the outcomes did not significantly change between Phase 1 and Phase 2, with the exception of academic average, extrinsic motivation, amotivation, positive affect, and rumination. These changes are considered small effect sizes according to Cohen's (1992) guidelines for Cohen's *d*. Given the relative stability of the outcome variables from the beginning of the semester to the end of the semester, the following moderation analyses evaluate the 2 × 2 model by examining whether evaluative concerns perfectionism and personal standards perfectionism interact to predict subsequent levels of the outcomes (i.e., the temporal relationship), rather than predicting change in the outcomes.

Prior to conducting the moderation analyses, bivariate correlational analyses were used to examine the relationships between the demographic variables and the study variables. With the exception of age, the demographic variables were not correlated with the study variables (*p*s > .01). Age was negatively correlated with Phase 1 evaluative concerns perfectionism (r = -.16), Phase 2 negative affect (r = -.18) and worry (r = -.21), and positively correlated with Phase 2 mindfulness (r = .21), *p*s < .01. Therefore, age was included as a covariate in the moderation analyses[4].

[4]The moderation analyses were also conducted without controlling for age, which resulted in the same pattern of results.

Table 4

Paired t-Tests Comparing Differences in Phase 1 and Phase 2 Outcomes

	Phase 1 *M (SD)*	Phase 2 *M (SD)*	*t*	Cohen's *d*	*r*
FFMQ Mindfulness	123.80 (17.51)	123.88 (18.79)	-.09	-0.01	.82**
Academic Average	77.64 (7.90)	76.28 (7.80)	2.75**	0.27[a]	.79**
Satisfaction with Average	3.17 (1.21)	3.16 (1.07)	.22	0.01	.71**
Goal Achievement	34.77 (9.54)	36.21 (11.22)	-2.05	-0.13	.46**
SCMS Self-Regulation	53.57 (11.12)	52.96 (10.76)	1.19	0.07	.74**
AMS Intrinsic Motivation	54.60 (13.11)	55.17 (13.17)	-.77	-0.05	.62**
AMS Extrinsic Motivation	67.74 (10.81)	65.90 (11.27)	2.98**	0.19	.63**
AMS Amotivation	6.95 (4.13)	7.92 (5.07)	-3.63**	-0.24[a]	.61**
SLSS Life Satisfaction	5.50 (1.15)	5.48 (1.10)	.51	0.03	.77**
PANAS Positive Affect	33.35 (7.21)	31.27 (7.77)	5.20**	0.34[a]	.66**
PANAS Negative Affect	22.03 (7.21)	21.65 (7.27)	.99	0.07	.67**
IPS Procrastination	26.47 (6.92)	26.27 (6.96)	.65	0.04	.77**
PSWQ Worry	54.41 (13.30)	53.57 (13.27)	1.46	0.09	.78**
RRS-B Rumination	6.16 (3.26)	5.55 (3.26)	3.41**	0.22[a]	.64**
DASS-21 Depression	4.49 (4.77)	4.68 (4.54)	-.76	-0.05	.66**
DASS-21 Anxiety	4.83 (4.31)	4.78 (4.14)	.23	0.02	.67**
DASS-21 Stress	7.23 (4.79)	7.27 (4.55)	-.17	-0.01	.70**

Note. [a]small effect size (d = 0.20-0.49), [b]medium effect size (d = 0.50-0.79); [c]large effect size ($d \geq$ 0.80).
*$p < .05$; **$p < .01$.

Hierarchical regression analyses. Following the statistical procedure outlined by Gaudreau and Thompson (2010), a series of moderated hierarchical linear regressions were employed to test the hypotheses of the 2 × 2 model (Cohen, Cohen, West, & Aiken, 2003). Centering predictor variables before they are entered into hierarchical regressions for moderation analysis is recommended in order to decrease multicollinearity between interaction terms and its corresponding main effects (Cohen et al., 2003). In the present study, evaluative concerns and personal standards perfectionism are composite measures created by z-scores; thus, the variables were not centered. The interaction term was calculated by multiplying the z-scores. In Step 1 of each hierarchical regression, age was entered as a control variable. In Step 2, evaluative concerns perfectionism and personal standards perfectionism at Phase 1 were entered as predictors. In Step 3, the interaction term (ECP × PSP) was entered. The adaptive and maladaptive outcomes at Phase 2 were entered as criterion variables in separate regressions.

For the regression analyses with a significant R^2 change at Step 2 (i.e., interaction effect), simple slope analyses were conducted to examine low (-1 *SD*) and high (+1 *SD*) levels of ECP. For regression analyses with a non-significant R^2 change at Step 2 (i.e., no interaction effect), the interaction term was dropped and the main effects model was used to examine the hypotheses of the 2 × 2 model, as outlined by Gaudreau (2012). Results of the hierarchical regression analyses examining interaction and main effects of Phase 1 evaluative concerns and personal standards predicting Phase 2 outcomes are displayed in Table 5 (i.e., adaptive outcomes) and Table 6 (i.e., maladaptive outcomes).

Predicted values and 95% confidence intervals for each perfectionism combination is presented in Table 7. Significant differences between the combinations are observed when the 95% confidence intervals do not overlap. These contrasts at high

(+1 *SD*) and low (-1 *SD*) levels of evaluative concerns and personal standards perfectionism are used to evaluate the 2 × 2 model.

Mindfulness. Hierarchical regression analysis indicated an interaction effect between evaluative concerns and personal standards predicting mindfulness (t = -2.34, p < .05; see Figure 3). Simple slopes analysis indicated that the slope for low level (-1 *SD*) ECP was significant (t = 3.32, p < .01), and the slope for high level (+1 *SD*) ECP was not significant (t = .16, p > .05). Similarly, predicted values support hypothesis 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and this study.

Academic average. In the absence of an interaction effect, the main effects model was examined. The results indicated a main effect of ECP (t = -3.61, p < .01) and a main effect of PSP (t = 4.75, p < .01). Predicted values support hypothesis 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and this study.

Satisfaction with average. Given that there was no interaction effect, the main effects model was examined. The findings indicated a main effect of ECP (t = -4.16, p < .01), but no main effect of PSP (t = 1.22, p > .05). Predicted values support hypothesis 1c (i.e., pure PSP does not differ from non-perfectionism in terms of adaptiveness), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and the present study.

Goal achievement. The main effects model was examined since there was no interaction effect. The results indicated a main effect of ECP (t = -3.17, p < .01), but no main effect of PSP (t = 1.17, p > .05). Predicted values support hypothesis 1a (i.e., pure PSP does not differ from non-perfectionism in terms of adaptiveness), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and the current study.

Self-regulation. In the absence of an interaction effect, the main effects model was examined. Results indicate a main effect of ECP (t = -8.87, p < .01) and a main effect of PSP (t = 6.04, p < .01). Predicted values support hypothesis 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and the present study.

Intrinsic motivation. There was no interaction effect, thus, the main effects model was examined. The findings indicated a main effect of ECP (t = -1.87, p < .05) and a main effect of PSP (t = 3.92, p < .01). Predicted values support hypothesis 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and this study.

Extrinsic motivation. The main effects model was examined since there was no interaction effect. The results indicated no main effect of ECP (t = -.97, p > .05), but a main effect of PSP (t = 3.25, p < .01). Predicted values support hypothesis 1a (i.e., pure

PSP is more adaptive than non-perfectionism) and hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP) of the 2 × 2 model and the current study.

Overall life satisfaction. The findings indicated no interaction effect; therefore the main effects model was examined. The results indicated a main effect of ECP (t = -9.28, p < .01) and a main effect of PSP (t = 3.16, p < .01). Predicted values support hypothesis 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and this study.

Positive affect. Since there was no interaction effect, main effects were examined. The results indicated a main effect of ECP (t = -5.66, p < .01) and a main effect of PSP (t = 2.80, p < .01). Predicted values support hypothesis 1a (i.e., pure PSP is more adaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is less adaptive than non-perfectionism), hypothesis 3 (i.e., mixed perfectionism is more adaptive than pure ECP), and hypothesis 4 (i.e., pure PSP is more adaptive than mixed perfectionism) of the 2 × 2 model and this study.

Negative affect. Hierarchical regression analysis indicated an interaction effect between evaluative concerns perfectionism and personal standards perfectionism at Phase 1 predicting negative affect at Phase 2 (t = 1.93, p < .05; see Figure 4). Simple slopes analysis indicated that the slope for low level (-1 *SD*) ECP was significant (t = -2.05, p < .01), and the slope for high level (+1 *SD*) ECP was not significant (t = .64, p > .05). Similarly, predicted values support hypothesis 1a (i.e., pure PSP is less maladaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is more maladaptive than non-

perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and the current study.

Amotivation. In the absence of an interaction effect, the main effects model was examined. The findings indicated a main effect of ECP ($t = 3.92$, $p < .01$), but no main effect of PSP ($t = -1.05$, $p > .05$). Predicted values support hypothesis 1c (i.e., pure PSP does not differ from non-perfectionism in terms of maladaptiveness), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and the present study.

Procrastination. The main effects model was examined since there was no interaction effect. The results indicated a main effect of ECP ($t = 5.47$, $p < .01$) and a main effect of PSP ($t = -2.87$, $p < .01$). Predicted values support hypothesis 1a (i.e., pure PSP is less maladaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), hypothesis 3 (i.e., pure ECP is more maladaptive than mixed perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and the current study.

Worry. An interaction effect was not present, thus the main effects model was examined. The findings indicated a main effect of ECP ($t = 4.10$, $p < .01$), but no main effect of PSP ($t = 1.78$, $p > .05$). Predicted values support hypothesis 1c (i.e., pure PSP does not differ from non-perfectionism in terms of maladaptiveness), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and this study.

Rumination. In the absence of an interaction effect, the main effects model was examined. The results indicated a main effect of ECP ($t = 5.16$, $p < .01$), but no main effect of PSP ($t = -.43$, $p > .05$). Predicted values support hypothesis 1c (i.e., pure PSP

does not differ from non-perfectionism in terms of maladaptiveness), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and the current study.

Depression. An interaction effect was present between evaluative concerns perfectionism and personal standards perfectionism at Phase 1 predicting depression at Phase 2 ($t = -2.27$, $p < .05$; see Figure 5). Simple slopes analysis indicated that the slope for low level (-1 *SD*) ECP was significant ($t = -2.16$, $p < .05$), and the slope for high level (+1 *SD*) ECP was not significant ($t = .78$, $p > .05$). Similarly, predicted values support hypothesis 1a (i.e., pure PSP is less maladaptive than non-perfectionism), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and this study.

Anxiety. The main effects model was examined, since there was no interaction effect. The findings indicated a main effect of ECP ($t = 6.99$, $p < .01$), but no main effect of PSP ($t = -.44$, $p > .05$). Predicted values support hypothesis 1c (i.e., pure PSP does not differ from non-perfectionism in terms of maladaptiveness), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and the current study.

Stress. In the absence of an interaction effect, the main effects model was examined. The results indicated a main effect of ECP ($t = 5.34$, $p < .01$), but no main effect of PSP ($t = 1.05$, $p > .05$). Predicted values support hypothesis 1c (i.e., pure PSP does not differ from non-perfectionism in terms of maladaptiveness), hypothesis 2 (i.e., pure ECP is more maladaptive than non-perfectionism), and hypothesis 4 (i.e., pure PSP is less maladaptive than mixed perfectionism) of the 2 × 2 model and the present study.

Table 5

Hierarchical Regression Analyses Examining Interaction and Main Effects of Phase 1 ECP and PSP Predicting Phase 2 Adaptive Outcomes

				β (t) pr			
	F	R^2	R^2 Δ	Age	ECP	PSP	ECP x PSP
FFMQ Mindfulness (interaction effect model)							
Step 1	11.15**	.05	.05**	.21** (3.34) .21			
Step 2	31.34**	.29	.24**	.13*(2.39) .15	-.56**(-8.55) -.49	.15*(2.36) .15	
Step 3	25.31**	.30	.02*	.13*(2.41) .16	-.53**(-7.94) -.46	.13*(2.01) .13	-.13*(-2.34) -.15
Academic Average (main effects model)							
Step 1	.05	.00	.00	-.02(-.23) -.02			
Step 2	8.07**	.10	.10**	-.03 (-.46) -.03	-.28**(-3.61) -.24	.37** (4.75) .31	
Satisfaction with Average (main effects model)							
Step 1	.55	.00	.00	.05(.74) .05			
Step 2	6.37**	.08	.07**	.01(.07) .01	-.31**(-4.16) -.26	.09 (1.22) .08	
Goal Achievement (main effects model)							
Step 1	1.03	.00	.00	.07 (1.02) .07			
Step 2	3.80**	.05	.04**	.03 (.53) .04	-.24**(-3.17) -.20	.09 (1.17) .08	
SCMS Self-Regulation (main effects model)							
Step 1	.48	.00	.00	.05 (.69) .05			
Step 2	27.33**	.26	.26**	-.02 (-.30) -.02	-.59** (-8.87) -.50	.40** (6.04) .37	
AMS Intrinsic Motivation (main effects model)							
Step 1	4.15*	.02	.02	.13*(2.04) .13			
Step 2	6.61**	.08	.06**	.13*(2.11) .14	-.14* (-1.87) -.12	.29**(3.92) .25	
AMS Extrinsic Motivation (main effects model)							
Step 1	.63	.00	.00	-.05 (-7.92) -.05			
Step 2	4.00**	.05	.05**	-.04 (-.65) -.04	-.07 (-.97) -.06	.24**(3.25) .21	
SLSS Life Satisfaction (main effects model)							
Step 1	.02	.00	.00	.01 (.13) .01			
Step 2	30.04**	.28	.28**	-.07 (-1.32) -.09	-.61** (-9.28) -.52	.21**(3.16) .20	
PANAS Positive Affect (main effects model)							
Step 1	1.35	.01	.01	.08 (1.16) .08			
Step 2	11.19**	.13	.12**	.03 (.41) .03	-.41**(-5.66) -.35	.20**(2.80) .18	

*$p < .05$; **$p < .01$.

Table 6

Hierarchical Regression Analyses Examining Interaction and Main Effects of Phase 1 ECP and PSP Predicting Phase 2 Maladaptive Outcomes

				β (t) pr			
	F	R^2	R^2 Δ	Age	ECP	PSP	ECP x PSP
PANAS Negative Affect (interaction effect model)							
Step 1	7.51**	.03	.03**	-.18**(-2.74) -.18			
Step 2	17.96**	.18	.15**	-.11(-1.85) -.12	.43**(6.12) .37	-.06 (-.86) -.06	
Step 3	14.56*	.20	.01*	-.11 (-1.86) -.12	.40**(5.60) .34	-.04 (-.57) -.04	.12*(1.93) .13
AMS Amotivation (main effects model)							
Step 1	2.77	.01	.01	-.11 (-1.66) -.11			
Step 2	6.56**	.08	.07**	-.07 (-1.05) -.07	.29**(3.92) .25	-.08 (-1.05) -.07	
IPS Procrastination (main effects model)							
Step 1	1.75	.01	.01	-.09 (-1.33) -.09			
Step 2	10.62**	.12	.11**	-.04 (-.62) -.04	.40**(5.47) .34	-.21**(-2.87) -.18	
PSWQ Worry (main effects model)							
Step 1	11.43**	.05	.05**	-.21**(-3.38) -.21			
Step 2	17.08**	.17	.13**	-.16**(-2.61) -.17	.29**(4.10) .26	.12(1.78) .12	
RRS-B Rumination (main effects model)							
Step 1	2.10	.01	.01	-.09 (-1.45) -.09			
Step 2	12.03**	.13	.12**	-.04 (-.57) -.04	.37**(5.16) .32	-.03 (-.43) -.03	
DASS-21 Depression (interaction effect model)							
Step 1	5.85*	.02	.02*	-.15*(-2.42) -.16			
Step 2	23.79**	.23	.21**	-.08 (-1.38) -.09	.50**(7.30) .43	-.07(-1.04) -.07	
Step 3	19.45**	.25	.02*	-.08 (-1.40) -.09	.46**(6.71) .40	-.05 (-.70) -.05	.13*(2.27) .15
DASS-21 Anxiety (main effects model)							
Step 1	4.96*	.02	.02*	-.14*(-2.23) -.14			
Step 2	23.11**	.23	.21**	-.07 (-1.17) -.08	.48**(6.99) .42	-.03 (-.44) -.03	
DASS-21 Stress (main effects model)							
Step 1	5.08*	.02	.02*	-.15*(-2.25) -.15			
Step 2	18.32**	.19	.17**	-.08 (-1.30) -.09	.37**(5.34) .33	.07 (1.05) .07	

*$p < .05$; **$p < .01$.

Table 7

Predicted Values and 95% Confidence Intervals of Adaptive and Maladaptive Outcomes

	Perfectionism Combinations				
	1 **Pure PSP** Low ECP High PSP	2 **Non-Perfectionism** Low ECP Low PSP	3 **Mixed Perfectionism** High ECP High PSP	4 **Pure ECP** High ECP Low PSP	Significant Contrasts
Adaptive Outcomes					
FFMQ Mindfulness[a]	129.87 (127.5-132.24)	120.47 (118.10-122.84)	105.52 (103.15-107.89)	105.02 (102.65-107.39)	1 > 2; 2 > 4; 1 > 3
Academic Average[b]	82.30 (81.26-83.34)	76.60 (75.56-77.64)	77.92 (76.88-78.96)	72.22 (71.18-73.26)	1 > 2; 2 > 4; 3 > 4; 1 > 3
Satisfaction with Average[b]	3.58 (3.44-3.72)	3.40 (3.26-3.54)	2.90 (2.76-3.04)	2.72 (2.58-2.86)	2 > 4; 1 > 3
Goal Achievement[b]	38.43 (37.02-39.84)	36.45 (35.04-37.86)	33.05 (31.64-34.46)	31.07 (29.66-32.48)	2 > 4; 1 >3
SCMS Self-Regulation[b]	64.46 (63.11-65.81)	55.82 (54.47-57.17)	51.64 (50.29-52.99)	43.00 (41.65-44.35)	1 > 2; 2 > 4; 3 > 4; 1 > 3
AMS Intrinsic Motivation[b]	53.95 (52.28-55.62)	46.33 (44.66-48.00)	50.29 (48.62-51.96)	42.67 (41.00-44.34)	1 > 2; 2 > 4; 3 > 4; 1 > 3
AMS Extrinsic Motivation[b]	71.33 (69.88-72.78)	65.75 (64.30-67.20)	69.65 (68.20-71.10)	64.07 (62.62-65.52)	1 > 2; 3 > 4;
SLSS Life Satisfaction[b]	6.69 (6.55-6.83)	6.25 (6.11-6.39)	5.35 (5.21-5.49)	4.91 (4.77-5.05)	1 > 2; 2 > 4; 3 > 4; 1 > 3
PANAS Positive Affect[b]	35.23 (34.25-36.21)	32.33 (31.35-33.31)	28.87 (27.89-29.85)	25.87 (24.89-26.85)	1 > 2; 2 > 4; 3 > 4; 1 > 3
Maladaptive Outcomes					
PANAS Negative Affect[a]	20.46 (19.54-21.38)	22.59 (21.67-23.51)	27.86 (26.94-28.78)	26.93 (26.01-27.85)	1 < 2; 2 < 4; 1 < 3
AMS Amotivation[b]	7.35 (6.68-8.02)	8.17 (7.70-8.84)	10.37 (9.70-11.04)	11.19 (10.52-11.86)	2 < 4; 1 < 3
IPS Procrastination[b]	23.07 (22.19-23.95)	25.97 (25.09-26.85)	28.61 (27.73-29.49)	31.51 (30.63-32.39)	1 < 2; 2 < 4; 3 < 4; 1 < 3
PSWQ Worry[b]	59.50 (57.81-61.19)	56.18 (54.49-57.87)	67.16 (65.47-68.85)	63.84 (62.15-65.53)	2 < 4; 1 < 3
RRS Rumination[b]	9.66 (9.25-10.07)	9.84 (9.43-10.25)	12.10 (11.69-12.51)	12.28 (11.87-12.69)	2 < 4; 1 < 3
DASS-21 Depression[a]	2.96 (2.39-3.53)	4.41 (3.84-4.98)	8.11 (7.54-8.68)	7.48 (6.91-8.05)	1 < 2; 2 < 4; 1 < 3
DASS-21 Anxiety[b]	3.75 (3.22-4.28)	4.01 (3.48-4.54)	7.63 (7.10-8.16)	7.89 (7.36-8.42)	2 < 4; 1 < 3
DASS-21 Stress[b]	7.26 (6.69-7.83)	6.60 (6.03-7.17)	10.62 (10.05-11.19)	9.96 (9.39-10.53)	2 < 4; 1 < 3

Note. Contrast 1 vs. 2 = Hypothesis 1. Contrast 2 vs. 4 = Hypothesis 2. Contrast 3 vs. 4 = Hypothesis 3. Contrast 1 vs. 3 = Hypothesis 4.
[a]Interaction effect model
[b]Main effects model

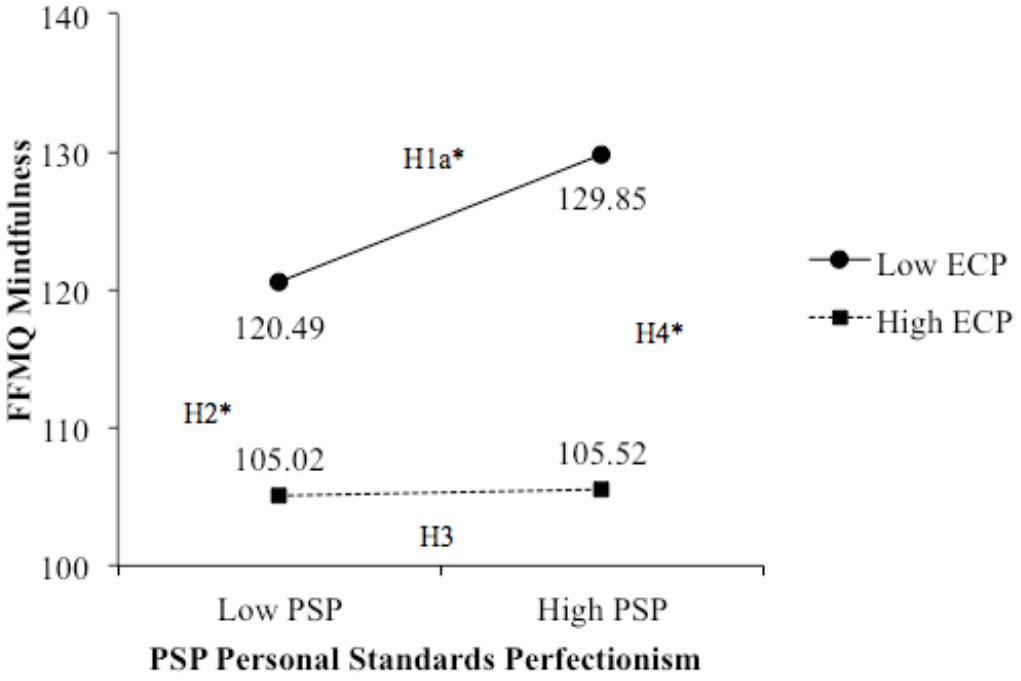

Figure 3. Interaction effect of Phase 1 evaluative concerns perfectionism and personal standards perfectionism predicting Phase 2 mindfulness, while controlling for age. *Represents a supported hypothesis of the 2 × 2 model.

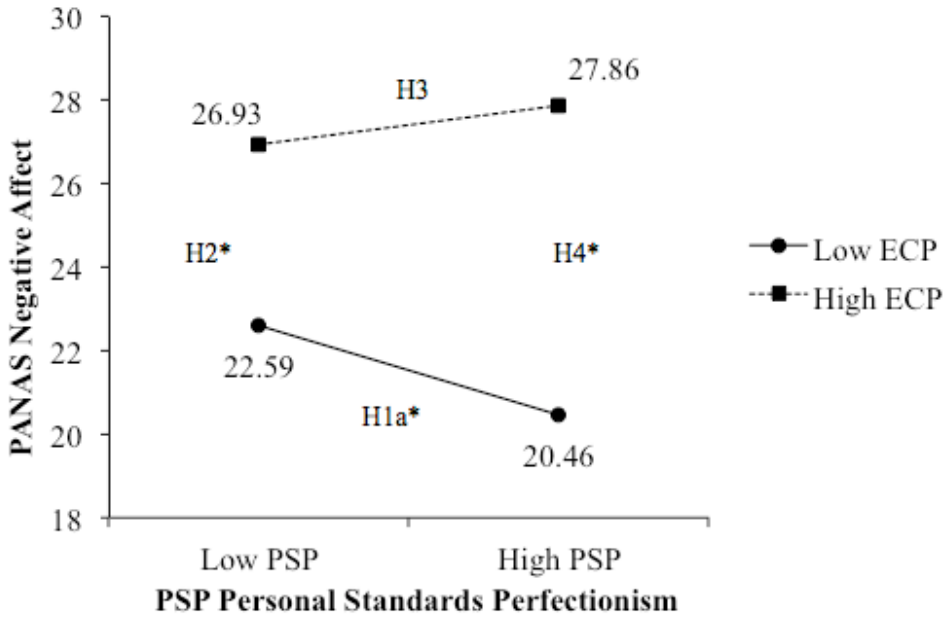

Figure 4. Interaction effect of Phase 1 evaluative concerns perfectionism and personal standards perfectionism predicting Phase 2 negative affect, while controlling for age. *Represents a supported hypothesis of the 2 × 2 model.

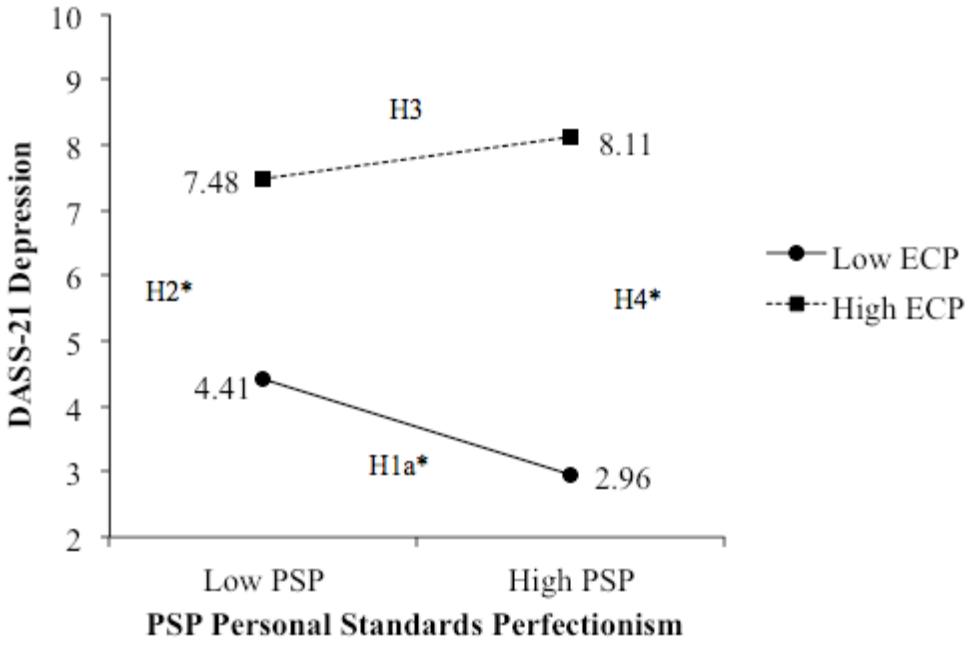

Figure 5. Interaction effect of Phase 1 evaluative concerns perfectionism and personal standards perfectionism predicting Phase 2 depression, while controlling for age. *Represents a supported hypothesis of the 2 × 2 model.

Meditation Analyses: Examining Underlying Mechanisms

Mediation analyses using a bootstrapped multivariate procedure (PROCESS; Hayes & Preacher, 2014) were conducted to explore mechanisms underlying evaluative concerns perfectionism and personal standards perfectionism and adaptive and maladaptive outcomes. Five thousand random samples of the original size were taken from the data, replacing each value as it was sampled, and indirect effects were computed in each sample (see Hayes & Preacher, 2014). A benefit of this procedure is that it allows multiple mediators to be examined in one model and reports the independent effect of each mediator, controlling for the other. Furthermore, covariates are permitted in the models. To examine the effects of evaluative concerns perfectionism and personal standards perfectionism, independent from each other, personal standards perfectionism was used as a covariate in the mediation models examining evaluative concerns perfectionism, and vice versa. Age was also used as a covariate, given that bivariate correlations indicated that being younger was associated with higher levels of evaluative concerns perfectionism, negative affect, and worry, and lower levels of mindfulness. If the upper and lower bounds of the bias-corrected 95% confidence intervals do not contain zero, the indirect effect is significant.

Evaluative Concerns Perfectionism. Regression coefficient estimates and bias-corrected 95% confidence intervals were calculated for the indirect effects of negative repetitive thoughts between evaluative concerns perfectionism and negative affect (see Figure 6). Results revealed that Phase 2 worry and rumination, both individually and combined, mediated the relationship between Phase 1 evaluative concerns perfectionism

and Phase 2 negative affect, while controlling for age and Phase 1 personal standards perfectionism. Therefore, these findings support hypothesis 5 of this study.

Next, regression coefficient estimates and bias-corrected 95% confidence intervals were calculated for the indirect effects of self-regulation between evaluative concerns perfectionism and procrastination (see Figure 7). Results revealed that Phase 2 self-regulation mediated the relationship between Phase 1 evaluative concerns perfectionism and Phase 2 procrastination, while controlling for age and Phase 1 personal standards perfectionism. This finding supports hypothesis 6 of this study.

Personal Standards Perfectionism. Regression coefficient estimates and bias-corrected 95% confidence intervals were calculated for the indirect effects of mindfulness between personal standards perfectionism and positive affect (see Figure 8). Results revealed that Phase 2 mindfulness mediated the relationship between Phase 1 personal standards perfectionism and Phase 2 positive affect, while controlling for age and Phase 1 evaluative concerns perfectionism. Thus, this finding supports hypothesis 7 of this study.

Regression coefficient estimates and bias-corrected 95% confidence intervals were calculated for the indirect effects of motivation between personal standards perfection and goal achievement (see Figure 9). Results revealed that Phase 2 intrinsic motivation, beyond the effects of extrinsic motivation, mediated the relationship between Phase 1 personal standards perfectionism and Phase 2 goal achievement, while controlling for age and Phase 1 evaluative concerns perfectionism. Lastly, no indirect effects of intrinsic and extrinsic motivation were found between personal standards perfectionism and overall academic average. These findings provide partial support for hypothesis 8 of this study (i.e., motivation mediates pure PSP and goal achievement).

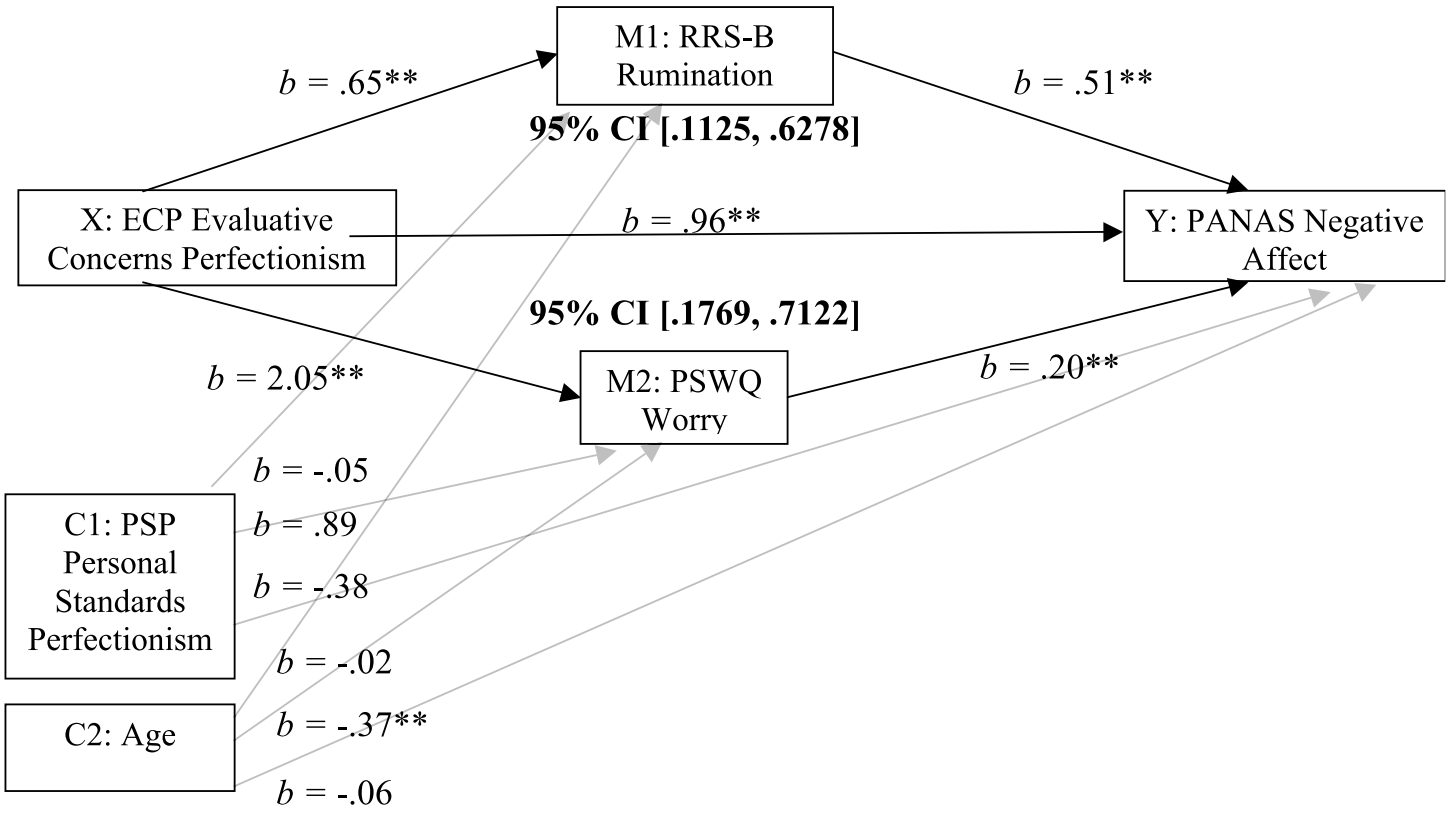

Figure 6. Indirect effects of Phase 2 negative repetitive thoughts on the relationship between Phase 1 evaluative concerns perfectionism and Phase 2 negative affect, while controlling for Phase 1 personal standards perfectionism and age. CI = Confidence Interval. *$p < .05$; ** $p < .01$

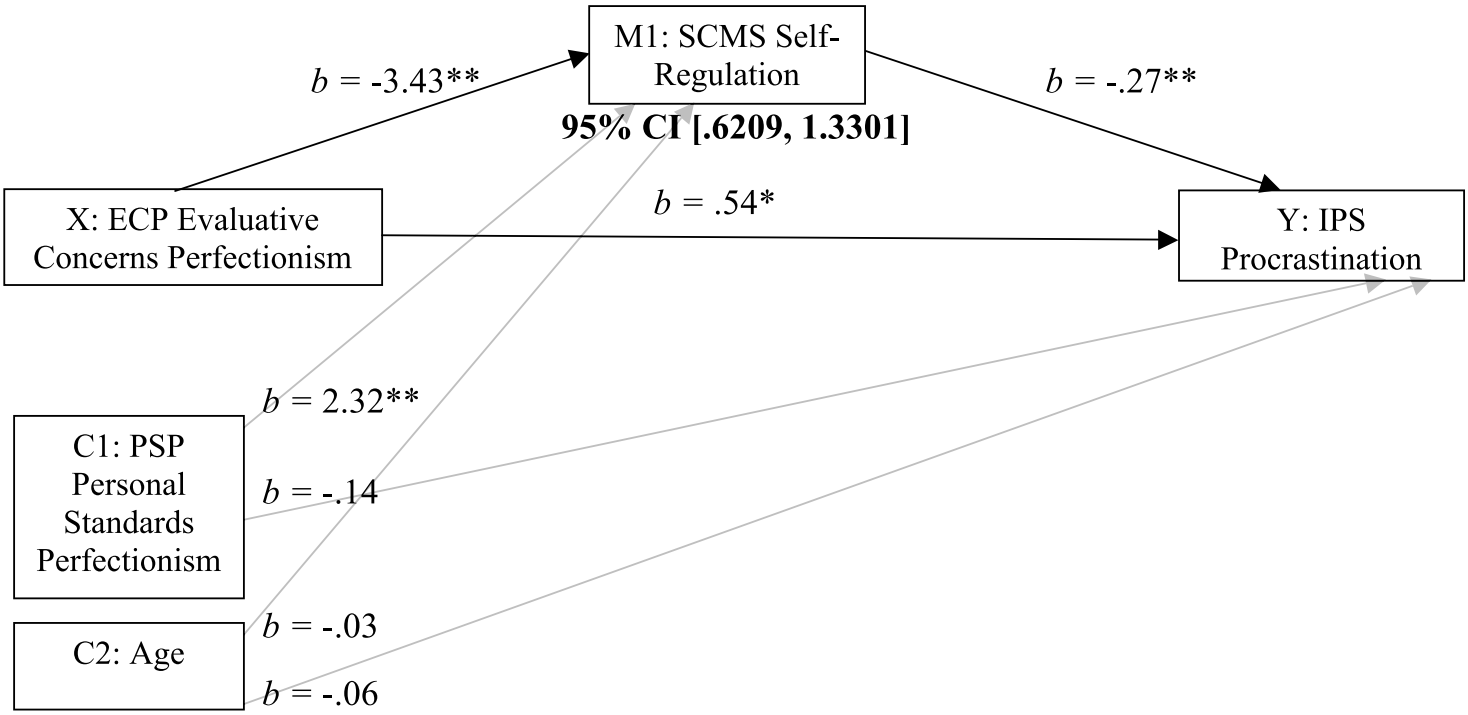

Figure 7. Indirect effect of Phase 2 self-regulation on the relationship between Phase 1 evaluative concerns perfectionism and Phase 2 procrastination, while controlling for Phase 1 personal standards perfectionism and age. CI = Confidence Interval.
*$p < .05$; ** $p < .01$

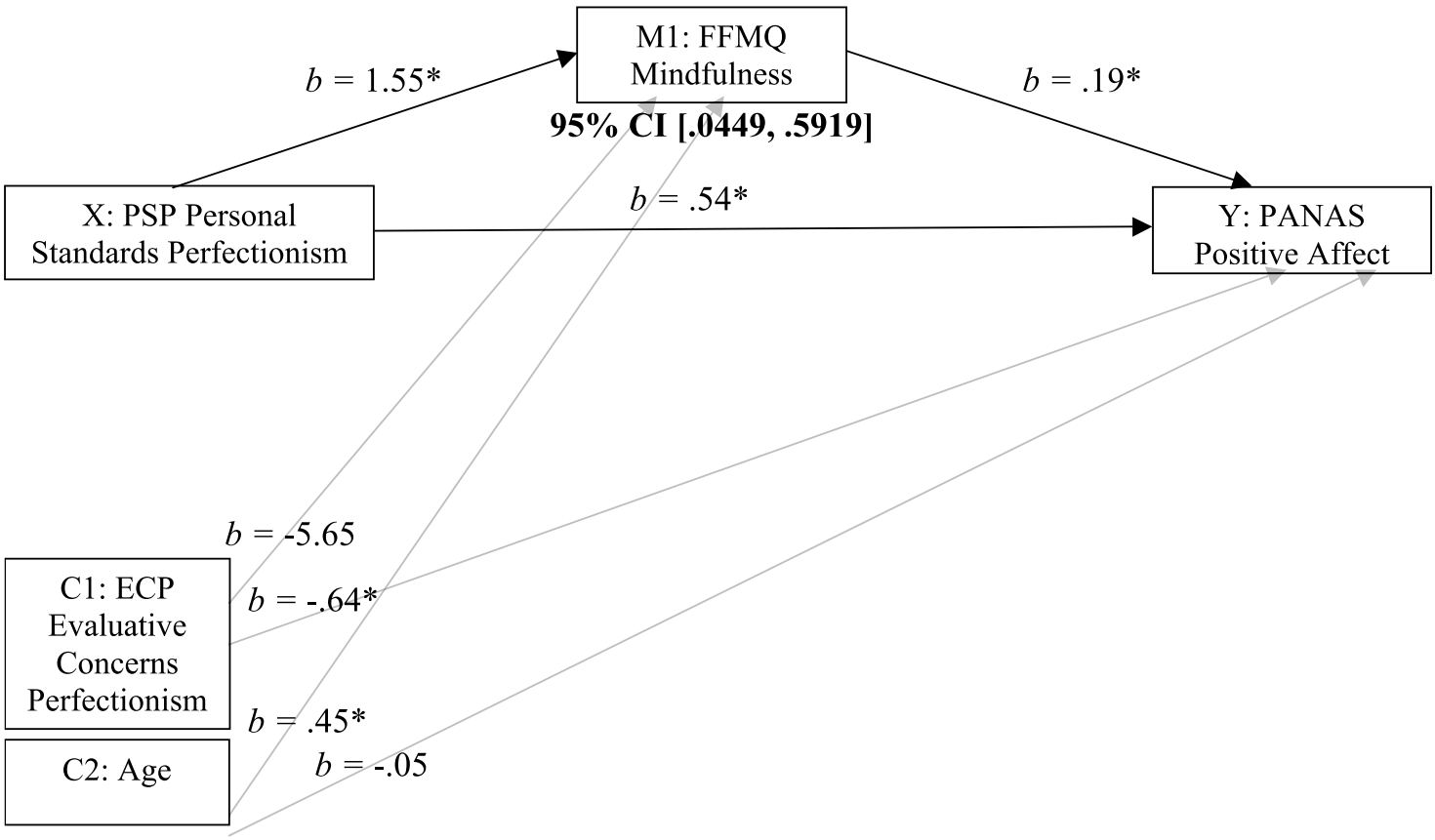

Figure 8. Indirect effect of Phase 2 mindfulness on the relationship between Phase 1 personal standards perfectionism and Phase 2 positive affect, while controlling for Phase 1 evaluative concerns perfectionism and age. CI = Confidence Interval.
*$p < .05$; ** $p < .01$

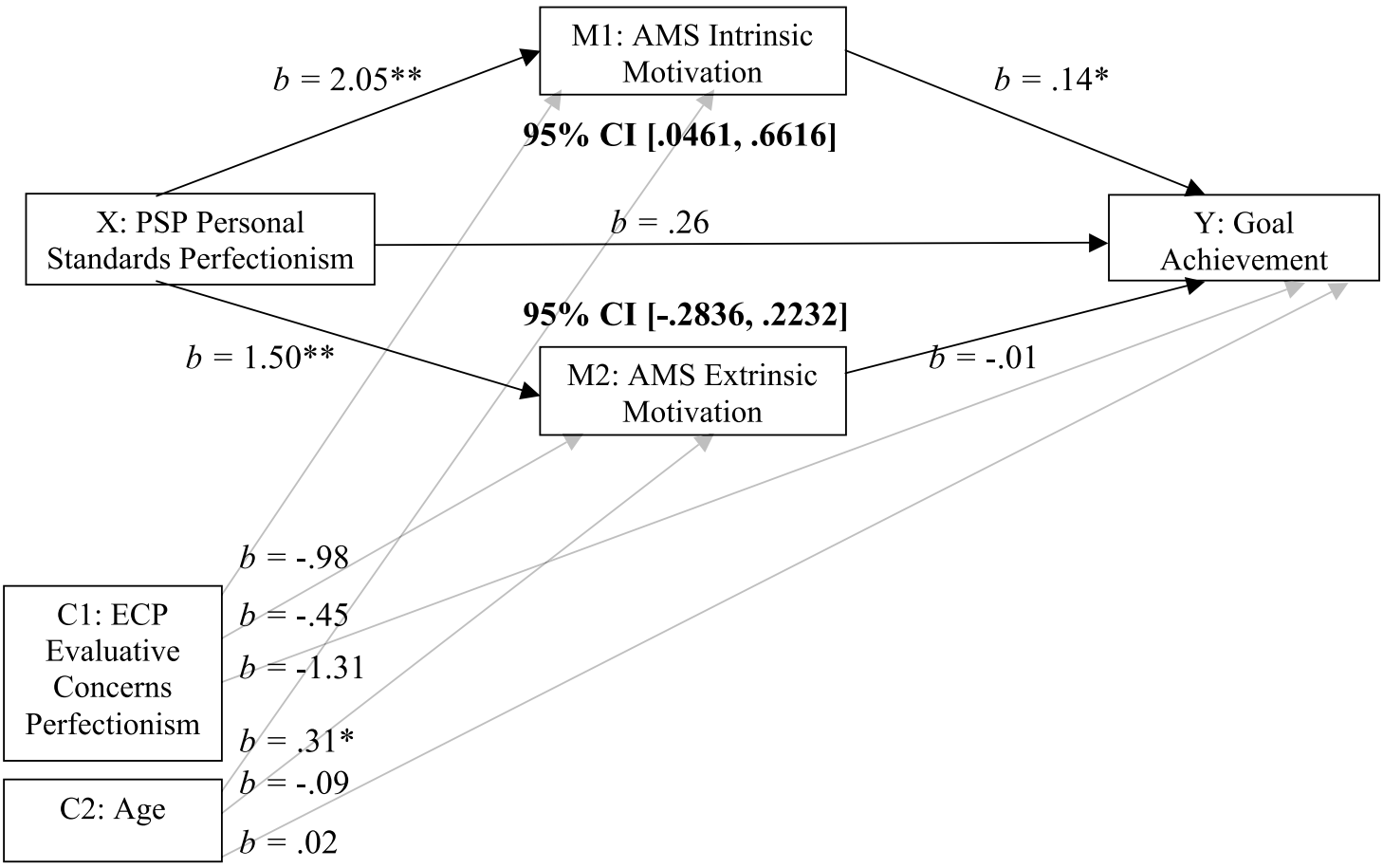

Figure 9. Indirect effects of Phase 2 motivation on the relationship between Phase 1 personal standards perfectionism and Phase 2 goal achievement, while controlling for Phase 1 evaluative concerns perfectionism and age. CI = Confidence Interval.
*$p < .05$; ** $p < .01$

Discussion

Whether high personal standards are adaptive, maladaptive, or benign has been debated in the perfectionism literature for over three decades (Hamachek, 1978). The current study not only examined the longitudinal outcomes of perfectionism combinations, but also how perfectionism develops into these outcomes. Study 1 primarily aimed to examine in what manner perfectionism predicts adaptive and maladaptive outcomes during an academic semester. By testing the 2 × 2 model of perfectionism, the interactive effects between personal standards and evaluative concerns were examined (Gaudreau, 2010; Gaudreau & Thompson, 2010).

The 2 × 2 model and the tripartite model both suggest that having high personal standards is inherently adaptive when it is not in the presence of high evaluative concerns (i.e., pure personal standards perfectionism). Whether high personal standards are more adaptive than no tendency towards perfectionism is key to determining the potential adaptiveness of this disposition. Thus, hypothesis 1 of the 2 × 2 model examines pure personal standards in relation to non-perfectionism, and whether pure personal standards perfectionism predicts higher adaptive and lower maladaptive outcomes (hypothesis 1a), lower adaptive and higher maladaptive outcomes (hypothesis 1b), or equal outcomes (hypothesis 1c) compared to non-perfectionism. Hypothesis 1a was supported by many of the adaptive outcomes in this study. Pure personal standards perfectionism predicted higher academic averages, and higher levels of self-regulation, intrinsic motivation, extrinsic motivation, overall life satisfaction, positive affect, and mindfulness at the end of the semester compared to non-perfectionism. However, pure personal standards predicted equal levels of satisfaction with academic average and goal achievement at the

end of the semester compared to non-perfectionism, which supports hypothesis 1c. In terms of maladaptive outcomes, hypothesis 1a was supported by some outcomes in this study. Pure personal standards predicted lower levels of negative affect, depression, and procrastination at the end of the semester compared to non-perfectionism. Pure personal standards predicted equal levels of amotivation, worry, rumination, anxiety, and stress at the end of the semester compared to non-perfectionism, which supports hypothesis 1c. It appears that pure personal standards perfectionism is adaptive in relation to some outcomes, but neutral in relation to other outcomes in an academic setting. Consistent with other examinations of the 2 × 2 model in academic, work, and sport contexts, hypothesis 1b was not supported by any outcome (e.g., Franche et al., 2012; Cumming & Duda, 2012; Li et al., 2014; Mallinson et al., 2014). This indicates that based on the outcomes examined in this study, having pure personal standards is either adaptive or benign, but never maladaptive, compared to no tendency towards perfectionism.

The 2 × 2 model examines all possible combinations of perfectionism, and suggests that having high evaluative concerns is the most maladaptive perfectionism combination. Furthermore, unlike the tripartite model, the 2 × 2 model suggests that this combination is distinct from not having perfectionistic tendencies. Thus, hypothesis 2 of the 2 × 2 model examines whether pure evaluative concerns predicts lower adaptive outcomes and higher maladaptive outcomes than non-perfectionism. The results from this study supported hypothesis 2 and indicated that pure evaluative concerns predicted lower academic averages, and lower levels of satisfaction with academic average, goal achievement, self-regulation, intrinsic motivation, overall life satisfaction, positive affect, and mindfulness at the end of the semester compared to non-perfectionism. Furthermore,

pure evaluative concerns predicted greater levels of all of the maladaptive outcomes at the end of the semester compared to non-perfectionism, including negative affect, amotivation, procrastination, worry, rumination, depression, anxiety, and stress. The only outcome that did not support hypothesis 2 was extrinsic motivation, such that pure evaluative concerns and non-perfectionism predicted equal levels of extrinsic motivation at the end of the semester. Previous studies indicate that socially prescribed perfectionism is related to non-self-determined academic motivation (Miquelon et al., 2005), suggesting that individuals with pure evaluative concerns might have higher levels of extrinsic motivation than non-perfectionists as a means to please others (i.e., externally regulated by significant others). However, the measure of extrinsic motivation used in this study focuses on being driven to achieve in university to gain better employment and higher salaries (i.e., externally regulated by the environment; Vallerand et al., 1992).

The current findings regarding hypothesis 2 of the 2 × 2 model indicate that the combination of high evaluative concerns without high personal standards is relevant to the study of perfectionism, and is a theoretically and empirically significant combination missing from the tripartite model. In this combination, perfectionistic standards are externally regulated by those significant to one's life, and this personality feature (i.e., socially prescribed perfectionism) is consistently associated with psychological distress in clinical and non-clinical populations (O'Connor et al., 2010; Wheeler et al., 2011).

Another distinct feature of the 2 × 2 model is that high evaluative concerns perfectionism in the presence of high personal standards (i.e., mixed perfectionism) buffers the maladaptive effects of pure evaluative concerns. However, the tripartite model suggests that the combination of both perfectionism dimensions exacerbates maladaptive

outcomes (i.e., unhealthy perfectionism; Stoeber & Otto, 2006). To examine this notion, hypothesis 3 suggests that mixed perfectionism predicts higher adaptive outcomes and lower maladaptive outcomes than pure evaluative concerns perfectionism. The findings from the current study provide mixed evidence, such that many of the adaptive outcomes, but few of the maladaptive outcomes supported this hypothesis. Mixed perfectionism predicted higher academic averages, and higher levels of self-regulation, intrinsic motivation, extrinsic motivation, overall life satisfaction, and positive affect at the end of the semester compared to pure evaluative concerns perfectionism. Contrary to hypothesis 3, mixed perfectionism predicted equal levels of satisfaction with average, goal achievement, and mindfulness at the end of the semester compared to pure evaluative concerns perfectionism. In terms of maladaptive outcomes, mixed perfectionism predicted lower levels of procrastination, but equal levels of negative affect, amotivation, worry, rumination, depression, anxiety, and stress at the end of the semester compared to pure evaluative concerns perfectionism. Notably, although the findings for some of the outcomes do not support the 2 × 2 model, they also do not support the tripartite model. That is, high levels of both dimensions did not exacerbate outcomes, but predicted equal outcomes compared to pure high evaluative concerns.

Interestingly, the findings indicate that when adaptive and maladaptive outcomes are compared in one study, hypothesis 3 is more greatly supported by adaptive outcomes than by maladaptive outcomes. This pattern is consistent with the postulation that the 2 × 2 model may provide a unique framework to reveal differences between perfectionism combinations in terms of adaptive outcomes (Hill, 2013). These findings highlight the relevance of including a variety of outcomes to fully evaluate the 2 × 2 model and that

adaptiveness and maladaptiveness are not opposite ends of the same spectrum. For instance, the absence of negative affect does not establish the presence of positive affect.

Lastly, the tripartite model characterizes the combination of high personal standards and low evaluative concerns as "healthy perfectionism" and the combination of high personal standards and high evaluative concerns as "unhealthy perfectionism"; whereas, the 2 × 2 model characterizes these combination as pure personal standards perfectionism and mixed perfectionism, respectively. However, both models infer that the former is more adaptive than the latter. Therefore, hypothesis 4 of the 2 × 2 model suggests that pure personal standards perfectionism predicts higher adaptive outcomes and lower maladaptive outcomes than mixed perfectionism. This hypothesis was supported by all of the outcomes except for extrinsic motivation. Pure personal standards predicted high academic averages, and higher levels of satisfaction with academic average, goal achievement, self-regulation, intrinsic motivation, overall satisfaction with life, and positive affect at the end of the semester compared to mixed perfectionism. Moreover, pure personal standards predicted lower levels of negative affect, amotivation, procrastination, worry, rumination, depression, anxiety, and stress at the end of the semester compared to mixed perfectionism. However, pure personal standards and mixed perfectionism predicted equal levels of extrinsic motivation at the end of the semester; thus, being driven by environmental rewards is not a unique aspect of being intrinsically oriented towards high strivings. Overall, it appears that concerns about being negatively evaluated by others buffers the adaptive effects of having high personal standards.

The secondary aim of Study 1 was to examine how perfectionism predicts adaptive and maladaptive outcomes during an academic semester. Possible mediators

were explored in the relationships between perfectionism dimensions and subjective well-being, and perfectionism dimensions and academic-related outcomes. Although other studies have examined mediating variables between perfectionism dimensions and adaptive and maladaptive outcomes, theses studies often use cross-sectional designs and do not tease apart the independent effects of the broad dimensions (e.g., Seo, 2008; Short & Mazmanian, 2013).

The results indicated that both worry and rumination mediated the relationship between evaluative concerns perfectionism and negative affect, independent of personal standards perfectionism. These findings support hypothesis 5 of the current study. Consistent with hypothesis 6 of this study, self-regulation mediated the relationship between evaluative concerns perfectionism and procrastination, independent of personal standards perfectionism. These findings suggest that perfectionists who are concerned with being evaluated by others may worry about meeting expectations and ruminate when they perceive that those expectations are not met. This cycle of negative repetitive thoughts may result in higher levels of negative affect at the end of the semester. Similarly, these perfectionists have difficulties in regulating goal-directed behaviour without an external resource, perhaps due to fear of not meeting others' expectations, which may lead to procrastination—behaviour commonly described as self-regulation failure and a major barrier to academic success (Ferrari, 2001).

This study also indicated that mindfulness mediated the relationship between personal standards perfectionism and positive affect, independent of evaluative concerns perfectionism. This finding supports hypothesis 7 of the present study. Students who have high personal standard, but are not concerned with being evaluated by others, may adopt

a more present-focused, accepting, non-judgmental mindset, rather than ruminating after falling short of a goal. This mindful approach contributes to greater experiences of positive affect at the end of the semester. In terms of academic outcomes, intrinsic motivation mediated the relationship between personal standards perfectionism and goal achievement, independent of evaluative concerns perfectionism. However, extrinsic motivation did not mediate this relationship. These findings provide partial support for hypothesis 8 of this study. Perfectionists who have high personal standards are intrinsically motivated, which leads to greater academic goal achievement. Given that these perfectionists aim to meet their own personally set standards, it is not entirely surprising that extrinsic motivation does not play a role in this relationship.

These results begin to clarify why perfectionism dimensions at the beginning of the semester result in well-being and academic outcomes at the end of the semester. Since the early conceptualizations of trait variables, it is suggested that "personality is something that does something" (Allport, 1938, p. 48). Although personality is considered a stable disposition, it expresses itself based on the context. Examining underlying mechanisms helps us understand the processes of perfectionism in academic settings.

Limitations and Future Directions

Some limitations of the present study should be mentioned. This study relies on mono-method/mono-source procedures, namely self-report instruments. Although validity measures were included as indicators of overly socially desirable and infrequent or careless responding, this aspect of the study design could be improved by including other methods. Observation and performance-based measures, as well as other sources,

such as family, peer, or instructor reports of perfectionism, achievement, and subjective well-being might be considered to more fully examine the constructs.

Another limitation is that the current sample predominantly consists of White females, and although this is typical of university samples, it limits the generalizability of the findings to other populations. Perfectionism is considered "endemic" to Western society and perfectionism dimensions that focus on personal standards versus external standards may manifest differently among cultures (Flett & Hewitt, 2002). Differences between North American and Asian cultures are a focus of recent studies (Franche et al., 2012; Smith et al., 2014), and may be furthered explored in future research. Moreover, although sex differences in perfectionism were not found in the current sample, it would be interesting to recruit specific populations, such as males, non-Whites, school-aged children, older adults, and certain university programs and occupations.

In this two-phase study, the mediator and outcomes were assessed at Phase 2. Future research should temporally separate the predictor, mediator, and outcome variables. Although the longitudinal nature of the study adds temporal antecedence of perfectionism over the outcomes, the short-term design precludes examining changes in the outcomes. To explore how perfectionism combinations predict changes in outcomes over time, an intervention design to modify the outcomes might be implemented.

Another reason to explore intervention designs is due to the current findings indicating that high evaluative concerns, whether alone or in combination with high personal standards, predicts poor well-being and academic functioning. Moreover, the results suggest that setting high personal standards should be encouraged in academic contexts, as it predicts higher levels of academic achievement, motivation, and well-

being, and also buffers against some of the effects of evaluative concerns. Thus, rather than eliminating perfectionistic standards, future research may consider intervention approaches that modify perfectionists' mindset surrounding their standards.

Results of this study suggest that pure personal standards perfectionism predicts the highest levels of mindfulness compared to all other perfectionism combinations. Furthermore, high evaluative concerns diminish levels of mindfulness regardless if it is combined with high or low personal standards. These results align with other studies that indicate that maladaptive perfectionism is related to decreased levels of self-acceptance (Flett et al., 2003; Lundh, 2004). Mindfulness fosters directing attention to the present moment in an accepting and non-judgmental way, which may be useful for perfectionists when they fall short of their standards.

Conclusion

The findings from Study 1 largely support the 2 × 2 model in predicting experiences of subjective well-being and achievement in university students during a semester. Pure personal standards perfectionism predicted higher levels of adaptive outcomes and lower levels of maladaptive outcomes than no tendency towards perfectionism for many of the study variables. Pure evaluative concerns perfectionism predicted lower levels of adaptive outcomes and higher levels of maladaptive outcomes than no tendency towards perfectionism. In contrast, a mixed combination buffered both the adaptive benefits of high personal standards and the maladaptive effects of high evaluative concerns. Setting personally relevant high standards, and letting go of concerns over others' expectations and negative reactions to perceived failure, may encourage happy and successful student populations.

STUDY 2

Burns (1980) noted that insight into the nature of one's difficulties may not be sufficient for changing thought patterns among perfectionists. Some prior research supports this observation and indicates that the cognitions and behaviours associated with perfectionism are highly resistant to change (Blatt & Zuroff, 2002). However, a recent meta-analysis examining cognitive-behavioural techniques (e.g., cognitive restructuring, behavioural experiments) for perfectionism in clinical populations indicated medium to large effects for reducing levels of maladaptive dimensions of perfectionism, such as concerns over mistakes and socially prescribed perfectionism (Lloyd, Schmidt, Khondoker, & Tchanturia, 2014). Furthermore, large effects were found for reducing adaptive dimensions of perfectionism, such as personal standards and self-oriented perfectionism (Lloyd et al., 2014).

Although reducing adaptive dimensions of perfectionism may be helpful or benign for individuals with perfectionism in the context of a psychiatric disorder, findings from Study 1 indicated that setting high personal standards is beneficial for undergraduates because it is associated with enhanced well-being and academic achievement and lower levels of procrastination and general distress. Little is known about techniques for targeting perfectionism outside of a clinical diagnosis. Rather than changing perfectionistic standards, mindfulness encourages acceptance of one's performance by directing attention to the present-moment in an accepting and non-judgmental way (Brown & Ryan, 2003). Therefore, mindfulness training may minimize maladaptive outcomes and enhance adaptive outcomes related to perfectionism.

Mindfulness can be conceptualized as both a dispositional characteristic and as a skill that can be learned and practiced, and it is associated with decreased psychological distress in both clinical and non-clinical populations (Evans, Ferrando, Carr, & Haglin, 2011; Evans, Ferrando, Findler, Stowell, Smart, & Haglin, 2008). The constructs of dispositional and cultivated mindfulness are most commonly measured by employing psychometrically sound self-report instruments. Baer and colleagues (2006) reviewed several self-report measures of mindfulness and through factor analysis, conceptualized the construct to be multi-faceted, specifically consisting of five skills: (1) observing internal and external experiences, such as sensations, cognitions, emotions, sights, sounds, and smells, (2) describing and labeling internal and external experiences with words, (3) acting with awareness, rather than acting mechanically with attention focused elsewhere, (4) non-judgment of inner experiences, such as thoughts and feelings, and (5) non-reactivity to inner experiences by letting experiences come and go. This five facet model of mindfulness provides a comprehensive conceptualization of the skills pertinent to the development of mindfulness. Moreover, the facets of non-judgment and non-reactivity appear to be ways to operationalize the construct of acceptance (Baer et al., 2006). Formal mindfulness training refers to a category of practices involving attention-training techniques aimed at cultivating these facets. The practices teach individuals to become non-judgmentally aware of internal and external experiences and counteract unhelpful thought patterns and behaviours (e.g., ruminating about academic grades) by repeatedly bringing one's attention back to the present-moment.

According to the perfectionism/acceptance theory, perfectionism is postulated to be maladaptive when individuals have low levels of self-acceptance (i.e., demanding

perfection), but adaptive when individuals have high levels of self-acceptance (i.e., striving for perfection; Lundh, 2004). Some research supports this theory, suggesting that the experience of high standards is not in itself maladaptive. Rather, judging oneself, perceiving that others are judging you, and not accepting failure is what contributes to distress (Campbell & Di Paula, 2002; Lundh, Saboonchi, & Wångby, 2008). Furthermore, maladaptive perfectionism is related to decreased levels of unconditional self-acceptance, indicating that maladaptive perfectionists demand perfection and experience distress when perfection is not achieved (Flett et al., 2003; Hall, Hill, Appleton, & Kozub, 2009; Lundh, 2004). On the other hand, adaptive perfectionism is related to high levels of self-acceptance, suggesting that adaptive perfectionists strive for perfection and are accepting of one self when standards are not met (Flett et al., 2003; Lundh, 2004). The results from Study 1 support this notion, such that adaptive perfectionism (i.e., personal standards) predicted higher levels of mindfulness, while maladaptive perfectionism (i.e., evaluative concerns perfectionism) predicted lower levels of mindfulness at the end of a semester.

A growing body of literature examines the role of self-acceptance and mindfulness in the link between perfectionism and adaptive and maladaptive outcomes. For instance, low levels of self-acceptance mediate the link between socially prescribed perfectionism and depression (Flett et al., 2003). Recent findings clarify this relationship further by revealing that evaluative dimensions of perfectionism may lead to low levels of self-forgiveness, due to one's difficulties with self-acceptance (Dixon, Earl, Lutz-Zois, Goodnight, & Peatee, 2014). The practices of mindfulness involve training in both self-acceptance and experiential acceptance (Block-Lerner, Salters-Pedneault, & Tull, 2005).

Thus, mindfulness training may target the nature of perfectionism and its associated processes and outcomes.

Many mindfulness-based interventions were primarily developed to target stress (e.g., Mindfulness-Based Stress Reduction; Kabat-Zinn, 1994) or depression (e.g., Mindfulness-Based Cognitive Therapy; Segal, Williams, & Teasdale, 2012). Thus, it is not surprising that these interventions are successful among healthy populations for managing stress (see Chiesa & Serretti, 2009 for review) and reducing psychological distress (Canby et al., 2014). Mindfulness might be helpful for individuals experiencing psychological distress related to their perfectionism standards. When individuals high on maladaptive dimensions of perfectionism perform short of a goal, they may respond with "should" systems rather than compassionate self-acceptance (Burns, 1980), which leads to cycles of negative repetitive thoughts and experiences of depression. The development of non-judgment and non-reactivity may help these individuals disengage from negative repetitive thought patterns. Moreover, training of these skills might not only minimize maladaptive outcomes related to perfectionism, such as psychological distress and negative repetitive thoughts, but also enhance adaptive outcomes related to perfectionism.

Dispositional mindfulness is positively associated with overall levels of positive affect and satisfaction with life (Caldwell et al., 2010); therefore, training in mindfulness might enhance subjective well-being in students. Collard, Avny, and Boniwell (2008) examined changes in psychological distress and well-being after students completed Mindfulness-Based Cognitive Therapy. However, findings indicated that although levels of negative affect decreased, levels of positive affect remain unchanged. Given that this study did not include a control group, it would be helpful to examine changes in other

forms of well-being (e.g., satisfaction with academic achievement and overall life) and in comparison to students who do not complete training.

Prior research also suggests that mindfulness training may improve academic outcomes relevant to perfectionism, such as self-regulation and procrastination. A recent study by Short, Mazmanian, Oinonen, and Mushquash (2015) indicated that the facets of acting with awareness and describing internal and external stimuli are the abilities mostly strongly related to self-regulation of goal directed behaviour in university students. Moreover, self-regulation mediates the positive relationship between dispositional mindfulness and later experiences of positive affect, as well as the negative relationship between dispositional mindfulness and later experiences of negative affect (Short et al., 2015). A recent study by Canby and colleagues (2014) indicated that six weeks of mindfulness training for university students resulted in greater increases in self-control compared to a passive control group. Lastly, procrastination has been described as a failure of self-regulation and is often a barrier to goal attainment (Ferrari, 2001). Thus, mindfulness may decrease procrastination related to maladaptive perfectionism and further increase goal attainment related to adaptive dimensions of perfectionism. Research by Howell and Buro (2011) indicated that mindfulness positively correlated with goal orientation, help-seeking behaviours, and self-control, and negatively correlated with procrastination. Furthermore, self-regulation mediated the relationship between mindfulness and academic achievement in students (Howell & Buro, 2011).

Few studies have empirically evaluated mindfulness skills training in relation to perfectionism, with much of the research coming from sports psychology. A mindfulness-training program, Mindful Sport Performance Enhancement, was developed

to promote "flow" (i.e., a mindset that occurs when an individual perceives balance between challenges and one's abilities to meet demands), which relates to the cognitive state needed for athletes to achieve their best performance (Kaufman, Glass, & Arnkoff, 2010). Mindful Sport Performance Enhancement consists of a four-week program involving training in various mindfulness skills developed by Jon Kabat-Zinn, such as the body scan and mindful breathing. In this study, a strong negative relationship was found between perfectionism and flow in a sample of 11 archers and 21 golfers (Kaufman et al., 2010). Moreover, results of mindfulness training revealed that although overall levels of perfectionism did not significantly change, related outcomes, such as flow and sports confidence, significantly increased (Kaufman et al., 2010). Other research has revealed similar positive results in long-distance runners (De Petrillo, Kaufman, Glass, & Arnkoff, 2009), and effects from both of these studies were maintained one year later (Thompson, Kaufman, De Petrillo, Glass, & Arnkoff, 2011).

Aims and Hypotheses of Study 2

The aim of Study 2 was to investigate the stability of adaptive outcomes (i.e., well-being, achievement, and motivation) and maladaptive outcomes (i.e., psychological distress, procrastination, and negative repetitive thought) related to perfectionism. Namely, this study examined if perfectionism's adaptive effects can be enhanced and maladaptive effects minimized over time through mindfulness training. Additionally, many studies that examine mindfulness training in students do not include a measure of mindfulness or only use a unidimensional measure (e.g., Canby et al., 2014). Including the five facet model of mindfulness allowed the investigation of changes in specific facets after training.

Hypotheses

This is the first study to examine the effects of mindfulness training on perfectionism dimensions and health- and academic-related outcomes in university students. The hypotheses for this study focus on changes over the training period.

Hypothesis 1. Levels of mindfulness will increase in the mindfulness group, but will not change in the control group. This is, in effect, a manipulation check.

Hypothesis 2. Although some research suggests that levels of perfectionism can change after intervention (e.g., Lloyd et al., 2014), other studies indicate that this disposition is highly resistant to change (Blatt & Zuroff, 2002). It is anticipated that after four weeks of training, levels of evaluative concerns perfectionism and personal standards perfectionism will not change.

Hypothesis 3. Adaptive outcomes (i.e., subjective well-being, achievement, and motivation) will increase in the group receiving mindfulness training compared to the control group that does not receive mindfulness training.

Hypothesis 4. Maladaptive outcomes (i.e., psychological distress, procrastination, motivation) will decrease in the group receiving mindfulness training compared to the control group that does not receive mindfulness training.

Methods

Participants

Inclusion criteria for Study 2 consisted of being enrolled in an undergraduate class at Lakehead University and being 18 years of age or older. Exclusion criteria consisted of (1) prior mindfulness training or prior training of any form of meditation, (2) currently receiving psychotherapy, or (3) currently receiving psychopharmacology during the study

period. A total of 71 students indicated interest in participating in the study and completed the Phase 1 questionnaire battery. Of these, five participants were currently receiving psychotherapy, psychopharmacology, or both, and were excluded from the study. A total of 57 participants (80.3%) responded in order to continue to the next stage of the study (i.e., randomization and enrollment in the four-week training period). Next, 29 students were randomized to the mindfulness group and 28 students were randomized to the control group (i.e., no mindfulness training).

Given that previous research indicates that two to four weeks of mindfulness training is effective at enhancing mindfulness skills (Ditto et al., 2006; Kaufman et al., 2010; Tang et al., 2007), participants in the mindfulness group were required to attend at least two of the classes. A total of five participants who were randomized to the mindfulness group only attended one or none of the classes. Further, one participant chose to discontinue the study after attending the first class due to personal reasons. All 23 of the remaining participants in the mindfulness group completed the post-training questionnaire battery. However, three of the 29 participants randomized to the control group did not respond to the post-training questionnaire battery. Thus, the final sample size of the mindfulness group was 23 participants and the final sample of the control group was 25 participants. The data was also screened for careless responding, and given that all total scores on the PRF-IN were less than or equal to the suggested cut-off of four, all 48 participants were retained for analyses (Jackson, 1984). Progress of participants through the study is displayed in Figure 10. Demographic characteristics of the total sample and study groups (i.e., mindfulness, control, and non-completers) are presented in Table 8.

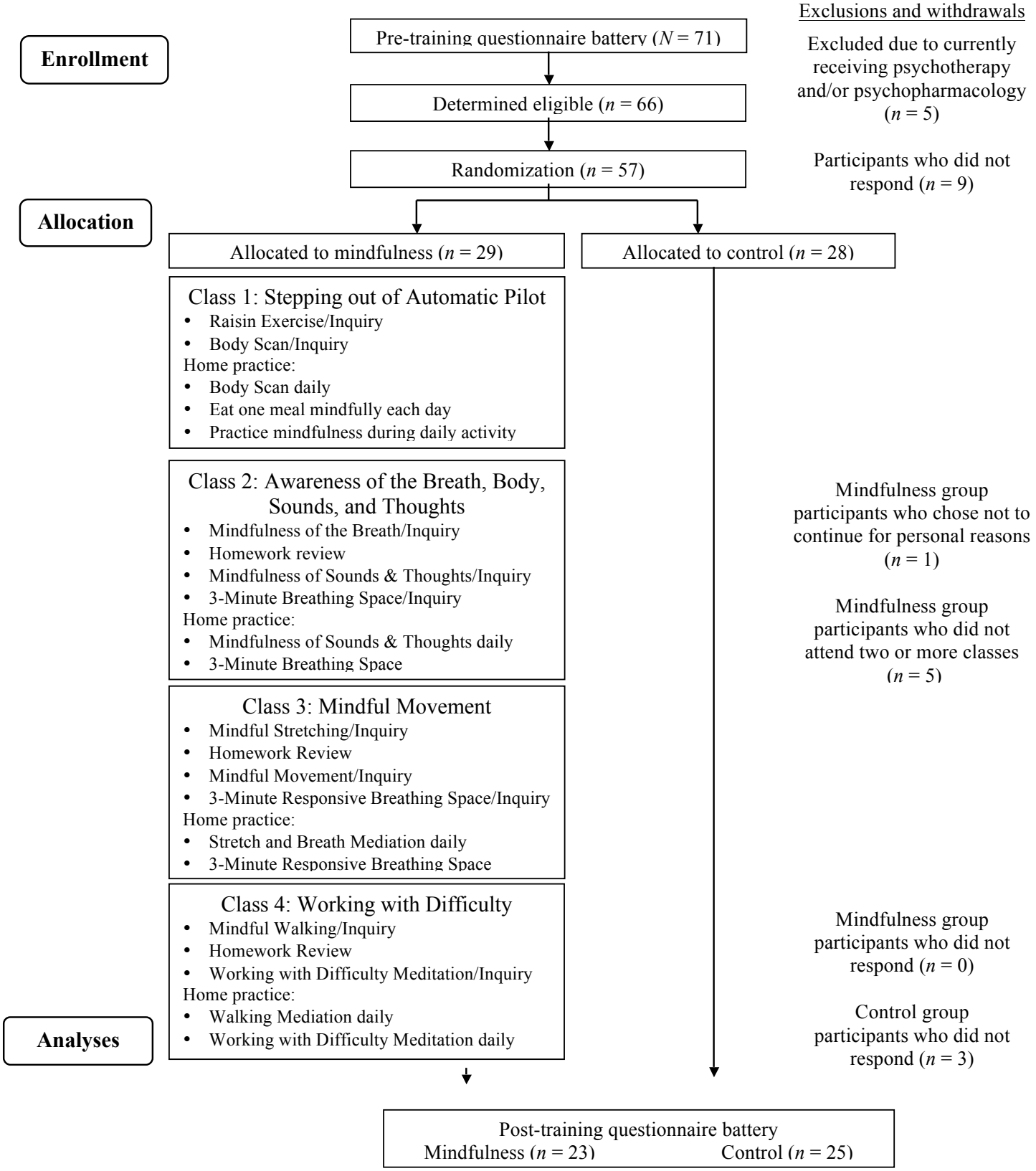

Figure 10. Progression of participants through Study 2.

Table 8

Demographic Characteristics of Study 2 Final Sample and Groups

	Mean (*SD*) / *n* (Percentage)			
Variable	Total Sample (*N* = 71)	Mindfulness Group (*n* = 23)	Control Group (*n* = 25)	Non-Completers[a] (*n* = 23)
Age (years)	21.30 (5.26)	21.52 (4.89)	22.08 (6.37)	20.22 (4.22)
Sex (female)	50 (70.4%)	15 (65.2%)	19 (76%)	16 (69.6%)
Sexual Orientation (exclusively heterosexual)	60 (84.5%)	20 (87.0%)	20 (80%)	20 (87.0%)
Primary Ethnicity (white)	62 (87.3%)	22 (95.6%)	22 (88%)	18 (78.3%)
Where From				
City (10, 000 or more)	56 (78.9%)	18 (78.3%)	20 (80.0%)	18 (78.3%)
Town (1,000 – 9, 999)	10 (14.1%)	4 (17.4%)	3 (12.0%)	3 (13.0%)
Village (100 – 999)	3 (4.2%)	1 (4.3%)	1 (4.0%)	1 (4.3%)
Marital Status				
Married	3 (4.2%)	1 (4.3%)	2 (8.0%)	0 (0.0%)
Common Law	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Divorced/Separated	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Committed Relationship	22 (31.0%)	6 (26.1%)	5 (20.0%)	11 (47.8%)
Single	46 (64.8%)	16 (69.6%)	18 (72.0%)	12 (52.2%)
Employment Status				
Full-Time	3 (4.2%)	0 (0.0%)	1 (4.0%)	2 (8.7%)
Part-Time	31 (43.7%)	10 (43.5%)	10 (40.0%)	11 (47.8%)
Unemployed	36 (50.7%)	13 (56.5%)	13 (52.0%)	10 (43.5%)
Annual Family Income				
$0 – $19, 999	13 (18.3%)	6 (26.1%)	4 (16%)	3 (13.0%)
$20, 000 – $39, 999	7 (9.9%)	0 (0.0%)	2 (8.0%)	5 (21.7%)
$40, 000 – $59, 999	5 (7.0%)	3 (13.0%)	2 (8.0%)	0 (0.0%)
$60, 000 – $79, 999	6 (8.5%)	2 (8.7%)	1 (4.0%)	3 (12.0%)
$80, 000 – $99, 999	8 (11.3%)	6 (26.1%)	2 (8.0%)	0 (0.0%)
$100, 000 – $119, 999	6 (8.5%)	1 (4.3%)	2 (8.0%)	3 (13.0%)
$120, 000 – $139, 999	6 (8.5%)	1 (4.3%)	2 (8.0%)	3 (13.0%)
$140, 000 – $159, 999	7 (9.9%)	1 (4.3%)	3 (12.0%)	3 (13.0%)
$160, 000 – $179, 999	7 (9.9%)	2 (8.7%)	3 (12.0%)	2 (8.7%)
$180, 000 – $199, 999	3 (4.2%)	0 (0.0%)	3 (12.0%)	0 (0.0%)
greater than $200, 000	2 (2.8%)	1 (4.3%)	1 (4.0%)	0 (0.0%)
Educational Status (Full-Time)	66 (93.0%)	21 (91.3%)	22 (88.0%)	23 (100.0%)
Year of University				
First	46 (64.8%)	12 (52.2%)	15 (60.0%)	19 (82.6%)
Second	7 (9.9%)	2 (8.7%)	2 (8.0%)	3 (13.0%)
Third	8 (11.3%)	4 (17.4%)	3 (12.0%)	1 (4.3%)
Fourth	8 (11.3%)	4 (17.4%)	4 (16.0%)	0 (0.0%)
Fifth or more	2 (2.8%)	1 (4.3%)	1 (4.0%)	0 (0.0%)

[a]Non-completers include participants who chose to not to continue in the study before randomization, during the 4-week training period, or during the post-training questionnaires.

Measures

Self-report measures. Study 2 involved the same self-report measures as described in Study 1, with the addition of three questions regarding prior mindfulness training. Participants were asked whether they previously received any training with mindfulness or any form of meditation. If participants responded "yes", they were asked to describe the type and duration of training. This question was included on the demographic information form (Appendix A). Data collection occurred one week before the mindfulness training (i.e., pre-training) and one week after four weeks of mindfulness training (i.e., post-training).

Independent-rater measure. A measure of mindfulness training adherence was created for the current study (Appendix W). The 8-item measure is a modified version of the Mindfulness-Based Cognitive Therapy Adherence Scale (Segal, Teasdale, Williams, & Gemar, 2002) where the cognitive therapy-relevant items were removed and the mindfulness items were adapted to the content of the current mindfulness training classes (e.g., "The facilitators highlighted the links between body sensations, thoughts, and emotions"). Items are rated on a three-point Likert-type scale ranging from 0 (no evidence) to 3 (full evidence). Ratings can range from 0 to 16 and higher scores indicate greater adherence to mindfulness training.

Procedure

Lakehead University's Research Ethics Board reviewed and approved the current study (Appendix P). The researcher visited undergraduate classes and orally informed the students of the opportunity to be involved in research that investigates whether "mindfulness skills training can minimize negative outcomes and enhance positive

outcomes in students" (Appendix X). The same information was provided in written format to students enrolled in online classes or where with the instructor preferred email correspondence. Participants were presented with an incentive of two bonus marks for participating in the study. One bonus mark was given for completing the pre-training questionnaire battery, and the second bonus mark was given for completing the post-training questionnaire battery. Similar to Study 1, participants were asked to provide their name and email address in order to be contacted to complete the post-training questionnaire battery (Appendix R); however, contact information was destroyed after completion of the post-training questionnaire battery. All data were coded with a number and not associated with contact information. The students were given an information letter (Appendix Y), which included a website to access if they wished to participate.

Students were randomly assigned to a mindfulness or control group. To ensure equal sample sizes in both groups, block randomization was used to assign participants. The mindfulness group was enrolled in four weekly 1.5-hour classes of mindfulness training, which incorporated formal techniques focused on learning the core facets of mindfulness. Pre-training (i.e., Phase 1 occurred one week before Class 1) and post-training (i.e., Phase 2 occurred one week after Class 4) questionnaire batteries assessed perfectionism, mindfulness, as well as adaptive outcome measures and maladaptive outcome measures. The questionnaire batteries were identical to Study 1, and identical across the two assessment periods. The control group did not complete the mindfulness training, but completed the pre-training and post-training questionnaire batteries during the same assessment periods as the mindfulness group. The mindfulness-training program was conducted five times over three academic semesters.

Questionnaire batteries for the mindfulness group and control group were completed online through a secured website service (i.e., SurveyMonkey). Consistent with Study 1, participants first read a consent form (Appendix Z) and indicated consent before continuing to the questionnaire battery. The demographic information form appeared at the beginning of the battery. The questionnaires were in a consistent order for each participant. Each questionnaire battery took approximately 60 minutes to complete. A debriefing form (Appendix AA) was presented at the end of each battery. Students in the control group were invited to email the researcher after the completion of the study if they wished to receive independent mindfulness training materials.

Mindfulness Training Classes. The training consisted of formal mindfulness meditation practices modeled after Mindfulness-Based Cognitive Therapy (Segal et al., 2012). The classes were intended to provide direct training and education in mindfulness, rather than be a form of psychotherapy. Each mindfulness training class involved a specific theme. The theme of the first class was "Stepping Out of Automatic Pilot" and practices included: (1) mindful eating, and (2) the body scan. The theme of the second class was "Awareness of the Breath, Body, Sounds, and Thoughts" and involved various sitting meditations including: (1) mindfulness of the breath, (2) mindfulness of the breath, body, sounds, and thoughts, and (3) the regular three-minute breathing space. "Mindful Movement" was the theme of the third class and practices included: (1) mindful stretching followed by a sitting meditation of mindfulness of the breath, (2) mindful walking followed by a sitting meditation of mindfulness of sounds and thoughts, and (3) the responsive three-minute breathing space. The final class involved "Working with Difficulty" and practices included: (1) mindful walking followed by a sitting meditation

of mindfulness of the breath and body, and (2) working with difficulty sitting meditation. The final class also included a discussion of strategies for continuing the mindfulness practices after the program ended. The specific in-class and home practices for each week are outlined in the flow diagram of Figure 10.

The four classes were designed to include a progression of skills through the practices, where foundational skills (e.g., focusing attention inward on body sensations) were introduced in the initial class and more advanced skills (e.g., non-judgmentally exploring the connection between difficult emotions, thoughts, and body sensations) were practiced in the latter classes. Moreover, the training program included a variety of practice modalities (e.g., sitting, walking, stretching) that students could explore. Mindful inquiry was led by the facilitators after each practice to provide participants an opportunity to discuss and reflect on the training experiences. During the classes, the facilitators aimed to foster a curious, accepting, and non-judgmental attitude towards all experiences expressed by the participants. The classes were delivered in a group format, and occurred once a week over four consecutive weeks. The length of each class was 1.5 hours, and daily home practice of mindfulness exercises were assigned between classes. A practice log was given to record independent practice of the skills (Appendix AA).

Instructor training. Instructor training prior to the study was guided by criteria outlined in the relevant literature, including: (1) personal engagement with mindfulness practice, (2) understanding of the rationales underpinning the use of mindfulness, (3) understanding of the aims of the various elements of the practices, and (4) opportunities to practice facilitating skills (Crane, Kuyken, Hastlings, Rothwell, & Williams, 2010). The student researcher and a post-doctoral student facilitated all of the classes together.

Both of the facilitators have personal mindfulness practices and completed professional training instructed by Zindel Segal (i.e., a developer of MBCT) in conducting mindfulness-based interventions. A pilot study was conducted with psychology graduate students to aid in the facilitators' training and provide an opportunity to deliver the four classes before the study commenced. Results of the pilot study indicated that the graduate students significantly improved in mindfulness and self-regulation skills after the four mindfulness classes (see Short et al., 2015 for full details of the pilot study).

Training Adherence. To ensure that the facilitators were consistent with the training program for all five of the mindfulness groups that were conducted, the training classes were audio-recorded for adherence checks. An independent rater reviewed a random sample of five recordings and completed a measure of facilitator adherence to mindfulness instruction. This measure was described in the method section and displayed in Appendix W. The rater was an advanced undergraduate student who was completing an honours degree in psychology and previously conducted research in mindfulness, but was not directly involved in the current study or familiar to the study hypotheses.

Results

Data Screening

Non-significant Little's (1998) MCAR tests indicated that missing data were missing completely at random at Phase 1 and Phase 2 ($\chi^2(14572) = .00$, $p > .05$; Little, 1988). Less than 1% of the data were missing, therefore, an expectation maximization algorithm in SPSS 22.0 was used to impute missing data.

Skewness and kurtosis for all scales and subscales were within acceptable limits (Tabachnick & Fidell, 2007). Outliers were screened by examining scores above or below

three standards deviations from the total scale or subscale mean. There were no outliers present in the data. The measure of social desirability (i.e., BIDR) was examined in relation to the study instruments. Bivariate correlations indicated that the BIDR and its subscales were correlated with some of the study instruments (*r*s = -.03 to .42). However, given that the effect sizes associated with the intercorrelations between the instruments did not change when controlling for the BIDR scores, social desirability was not entered as a control variable in the subsequent analyses.

Type I and II Error Rates and Effect Sizes

Similar to Study 1, test statistics in Study 2 are evaluated at both the .05 and .01 alpha levels in order to balance Type I and II error rates. To examine the size of the differences between pre-training and post-training scores, partial eta squared (η2) were computed and described according to Cohen's (1992) guidelines: η^2 =.01 suggests a small effect, η^2 = .09 suggests a medium effect, and η^2 = .25 suggests a large effect.

Descriptive Statistics, Reliability, and Validity of Study Instruments

The scale characteristics of the study instruments were investigated for the mindfulness group and control group sample. Descriptive statistics and reliability estimates for the pre-training and post-training assessment periods are presented in Table 9. The internal consistencies were estimated using coefficient alphas, and are all above the acceptable threshold of .70 (Nunnally, 1978). The DASS-21 mean scores for the depression, anxiety, and stress scales are in the normal severity range during both pre-training and post-training, based on a five-point classification system (i.e., normal – mild – moderate – severe – extremely severe; Anthony et al., 1998).

Table 9

Descriptive Statistics and Reliability Estimates of Study 2 Instruments for the Mindfulness Group and Control Group at Pre-and Post-Training (n =48)

	Mean	*SD*	Potential Range	Actual Range	Coefficient alpha
Perfectionism Measures					
Self-Oriented Phase 1	73.16	13.96	15 – 105	42 – 100	.87
Socially Prescribed Phase 1	55.60	14.13	15 – 105	31 – 86	.88
Personal Standards Phase 1	23.50	4.61	7 – 35	15 – 34	.76
Concerns About Mistakes Phase 1	23.66	9.10	9 – 45	9 – 43	.91
Parental Expectations Phase 1	14.75	5.00	5 – 25	6 – 25	.87
Parental Concerns Phase 1	9.02	4.13	4 – 20	4 – 19	.85
Doubts About Actions Phase 1	12.76	4.15	4 – 20	5 – 20	.84
Adaptive Outcomes					
FFMQ Mindfulness Phase 1	118.00	19.96	39 – 195	66 – 169	.91
Academic Average Phase 1[a]	78.04	9.93	0 – 100	60 – 98	--
Satisfaction with Average Phase 1	3.26	1.03	1 – 5	1 – 5	--
Goal Achievement Phase 1	33.72	10.04	6 – 54	12 – 51	.89
SCMS Self-Regulation Phase 1	50.90	13.23	0 – 80	17 – 79	.90
AMS Intrinsic Motivation Phase 1	57.36	12.37	12 – 84	27 – 83	.89
AMS Extrinsic Motivation Phase 1	65.31	13.48	12 – 84	27 – 84	.87
AMS Amotivation Phase 1	6.80	3.35	4 – 28	4 – 16	.74
BMSLSS Life Satisfaction Phase 1	5.13	1.16	1 – 7	1 – 7	--
PANAS Positive Affect Phase 1	31.67	7.28	10 – 50	18 – 46	.88
FFMQ Mindfulness Phase 2	120.36	20.35	39 – 195	56 – 163	.91
Academic Average Phase 2[b]	78.93	7.90	0 – 100	68 – 96	--
Satisfaction with Average Phase 2	3.02	1.16	1 – 5	1 – 5	--
Total Goal Achievement Phase 2	33.39	9.71	6 – 54	6 – 48	.86
SCMS Self-Regulation Phase 2	50.80	13.41	0 – 80	10 – 79	.90
AMS Intrinsic Motivation Phase 2	56.63	18.52	12 – 84	12 – 84	.95
AMS Extrinsic Motivation Phase 2	65.87	14.89	12 – 84	18 – 84	.92
AMS Amotivation Phase 2	8.40	4.92	4 – 28	4 – 22	.75
BMSLSS Life Satisfaction Phase 2	4.79	1.41	1 – 7	1 – 7	--
PANAS Positive Affect Phase 2	30.00	7.28	10 – 50	16 – 47	.90
Maladaptive Outcomes					
PANAS Negative Affect Phase 1	22.37	8.53	10 – 50	10 – 48	.90
IPS Procrastination Phase 1	27.19	5.73	9 – 45	13 – 38	.87
PSWQ Worry Phase 1	53.52	14.65	16 – 80	22 – 80	.94
RRS-B Rumination Phase 1	7.08	2.66	0 – 15	1 – 13	.83
DASS-21 Depression Phase 1	5.40	5.18	0 – 21	0 – 20	.91
DASS-21 Anxiety Phase 1	5.69	4.84	0 – 21	0 – 19	.85
DASS-21 Stress Phase 1	6.83	5.05	0 – 21	0 – 21	.87
PANAS Negative Affect Phase 2	23.19	8.04	10 – 50	12 – 46	.89
IPS Procrastination Phase 2	28.69	6.09	9 – 45	15 – 44	.86
PSWQ Worry Phase 2	54.98	13.69	16 – 80	28 – 80	.94
RRS-B Rumination Phase 2	7.38	3.57	0 – 15	0 – 15	.82
DASS-21 Depression Phase 2	6.65	5.84	0 – 21	0 – 21	.94
DASS-21 Anxiety Phase 2	6.87	4.73	0 – 21	0 – 21	.85
DASS-21 Stress Phase 2	7.77	5.35	0 – 21	0 – 21	.92

[a]$n = 23$; [b]$n = 22$

Training Adherence

Ratings of adherence to the mindfulness training protocol for a random sample of audio recordings indicated high adherence. All five of the recordings received a rating of 16, indicating full evidence of training adherence across all items for each recording.

Home Practice

Audio CDs of the mindfulness meditations and home practice logs were given to participants of the mindfulness group each week to facilitate practice outside of the classes. Participants were invited to submit their home practice logs to the student researcher at the end of the study. Of the 23 participants that completed the mindfulness training, only six participants submitted their practice logs at the end of the study. Thus, only descriptive statistics were conducted. On average, participants practiced 3.96 days (SD = 1.96) per week, and home practice ranged from one to seven days a week.

Pre-Training Scores and Characteristics

Pre-analyses. In order to examine potential changes in the broad dimensions of perfectionism in the mindfulness group and control group, measures of pre-training and post-training personal standards perfectionism and evaluative concerns perfectionism were calculated. Similar to Study 1, raw scores of the MPS-HF and MPS-F subscales were converted to z-scores and summed to create the composite measures.

Comparison of groups on pre-training scores and characteristics. One-way ANOVAs and chi-square tests were conducted to compare pre-training scores and the main demographic characteristics of the mindfulness group, control group, and non-completers (see Table 10). Findings indicated that the groups did not differ in terms of age, sex, ethnicity, relationship status, year of university, or the pre-training measures.

Table 10

One-Way ANOVAs and Chi-Square Tests Comparing Pre-Training Scores and Characteristics of the Mindfulness Group, Control Group, and Non-Completer Group

	Mean (*SD*) / *n* (Percentage)				
Variable	Mindfulness (*n* = 23)	Control (*n* = 25)	Non-Completers (*n* = 23)	F/X^2	*p*
Age	21.52 (4.89)	22.08 (6.37)	20.22 (4.22)	0.78	.46
Sex (female)	15 (65.22%)	19 (76.0%)	16 (69.57%)	0.68	.71
Ethnicity (white)	22 (95.65%)	22 (88.0%)	18 (78.26%)	4.02	.40
Relationship Status (single)	16 (69.57%)	18 (72.0%)	12 (52.17%)	5.92	.21
Year of University (first)	12 (52.17%)	15 (60.0%)	19 (82.61%)	8.71	.37
Perfectionism Measures					
Evaluative Concerns	.16 (1.87)	-.01 (1.87)	-.16 (1.93)	0.16	.85
Personal Standards	.07 (1.73)	.37 (1.98)	-.47 (1.57)	1.39	.26
Adaptive Outcomes					
FFMQ Mindfulness	116.07 (19.18)	119.77 (20.88)	123.08 (18.63)	0.73	.48
Satisfaction with Average	3.24 (0.94)	3.27 (1.12)	3.29 (1.01)	0.01	.99
Academic Average	76.21 (10.19)	80.41 (9.56)	78.78 (6.34)	0.65	.53
Goal Achievement	34.76 (9.90)	32.84 (10.27)	31.47 (10.43)	0.52	.59
SCMS Self-Regulation	50.37 (14.79)	52.39 (11.91)	52.22 (9.87)	0.13	.88
AMS Intrinsic Motivation	57.13 (9.86)	57.57 (14.51)	55.14 (13.34)	0.24	.79
AMS Extrinsic Motivation	66.03 (11.10)	64.64 (15.54)	70.70 (8.18)	1.62	.21
AMS Amotivation	6.53 (3.26)	7.04 (3.47)	6.45 (2.81)	0.24	.79
BMSLSS Life Satisfaction	5.01 (0.95)	5.24 (1.33)	5.14 (1.36)	0.22	.81
PANAS Positive Affect	31.13 (7.03)	32.17 (7.61)	31.74 (7.79)	0.12	.89
Maladaptive Outcomes					
PANAS Negative Affect	23.32 (7.64)	21.49 (9.34)	20.74 (6.53)	0.64	.53
IPS Procrastination	28.09 (4.75)	26.36 (6.50)	25.82 (7.24)	0.83	.44
PSWQ Worry	55.89 (13.74)	51.34 (15.40)	53.67 (13.47)	0.61	.55
RRS-B Rumination	7.87 (2.33)	6.36 (2.80)	5.91 (3.96)	2.51	.09
DASS-21 Depression	5.35 (5.18)	5.44 (5.29)	4.65 (4.20)	0.18	.84
DASS-21 Anxiety	5.87 (5.21)	5.52 (4.58)	4.57 (3.70)	0.51	.61
DASS-21 Stress	7.22 (4.95)	6.48 (5.22)	6.61 (4.52)	0.15	.86

*$p < .05$

Comparison of Mindfulness and Control on Pre-Training and Post-Training Scores

A series of 2-between group (mindfulness, control) × 2-within time (pre-training, post-training) ANOVAs were conducted to compare changes in mindfulness, perfectionism, and adaptive and maladaptive outcomes. In the presence of an interaction, post hoc paired sample *t*-tests were conducted to examine the amount of change in each group, as outlined in the primary hypotheses.

Changes in mindfulness and perfectionism. The findings from the ANOVAs comparing changes in mindfulness and perfectionism are presented in Table 11.

The results examining changes in total mindfulness indicated no main effect of group and no main effect of time, but a group × time interaction ($\eta^2 = .18$, medium effect; see Figure 11). Although the control group did not change in total mindfulness ($t = 1.61$, $p > .05$), the mindfulness group increased in total mindfulness over the training period ($t = -2.66$, $p < .01$).

The findings comparing the observing facet of mindfulness indicated no main effect of group, but a main effect of time and a group × time interaction ($\eta^2 = .08$, small effect; see Figure 12). Although the control group did not change in observing ($t = -0.68$, $p > .05$), the mindfulness group increased in observing over the training period ($t = -3.18$, $p < .01$).

When describing was examined, the results indicated no main effect of group and no main effect of time, but a group × time interaction ($\eta^2 = .09$, medium effect). However, post hoc *t*-tests indicated that neither the mindfulness group ($t = -1.36$, $p > .05$) nor the control group ($t = 1.68$, $p > .05$) changed in describing over the training period.

The findings comparing the acting with awareness facet indicated no main effect of group, no main effect of time, and no group × time interaction. Therefore, the mindfulness group and the control group did not change in levels of acting with awareness over the training period.

In terms of non-judgment, findings indicated no main effect of group and no main effect of time, but a group × time interaction ($\eta^2 = .09$, medium effect). However, post hoc *t*-tests indicated that neither the mindfulness group ($t = -1.56$, $p > .05$) nor the control group ($t = 1.40$, $p > .05$) changed in non-judgment over the training period.

The results comparing non-reactivity to experiences indicated no main effect of group and no main effect of time, but indicated a group × time interaction ($\eta^2 = .08$, small effect; see Figure 13). Although the control group did not change in non-reactivity ($t = -0.25$, $p > .05$), the mindfulness group increased in non-reactivity over the training period ($t = -2.96$, $p < .01$).

The findings comparing evaluative concerns perfectionism indicated no main effect of group and no main effect of time, but a group × time interaction ($\eta^2 = .13$, medium effect; see Figure 14). Although the control group increased in evaluative concerns ($t = -2.01$, $p < .05$), the mindfulness group did not change in evaluative concerns over the training period ($t = 1.66$, $p > .05$).

When levels of personal standards were compared, the results indicated no main effect of group, no main effect of time, and no group × time interaction. Thus, the mindfulness and the control groups did not change in levels of personal standards over the training period.

Table 11

Results of 2-Between (Mindfulness, Control) x 2-Within (Pre-Training, Post-Training) ANOVAs Comparing Changes in Mindfulness and Perfectionism

Variable	Mindfulness (n = 23)	Control (n = 25)	ANOVA	F	p	Partial η^2
Mindfulness						
FFMQ Total Mindfulness						
Pre-training	116.07	119.77	Time	2.09	.16	.04
Post-training	124.26	116.68	Group	0.13	.72	.00
Difference	8.19	-3.09	T x G	10.01**	.00	.18
FFMQ Observe						
Pre-training	25.57	25.68	Time	8.39**	.00	.15
Post-training	28.39	26.18	Group	0.45	.51	.01
Difference	2.82	0.50	T x G	4.11*	.04	.08
FFMQ Describe						
Pre-training	22.44	25.89	Time	0.08	.78	.00
Post-training	23.83	24.76	Group	1.38	.25	.03
Difference	1.39	-1.13	T x G	4.31*	.04	.09
FFMQ Awareness						
Pre-training	24.11	23.08	Time	1.21	.28	.03
Post-training	23.54	21.68	Group	0.98	.33	.02
Difference	-0.57	-1.40	T x G	0.21	.65	.01
FFMQ Non-Judgment						
Pre-training	24.30	25.04	Time	0.25	.62	.01
Post-training	26.39	23.76	Group	0.21	.65	.01
Difference	2.09	-1.28	T x G	4.42*	.04	.09
FFMQ Non-Reactivity						
Pre-training	19.22	20.08	Time	5.31	.03	.10
Post-training	21.96	20.30	Group	-.08	.77	.00
Difference	2.74	0.22	T x G	3.83*	.04	.08
Perfectionism						
ECP Evaluative Concerns						
Pre-training	0.16	-0.01	Time	0.03	.86	.00
Post-training	-0.17	0.38	Group	0.13	.72	.00
Difference	-0.33	0.39	T x G	6.56**	.00	.13
PSP Personal Standards						
Pre-training	0.07	0.37	Time	1.08	.31	.02
Post-training	-0.37	0.41	Group	1.11	.30	.02
Difference	-0.44	0.04	T x G	1.54	.22	.03

*p < .05; **p < .01

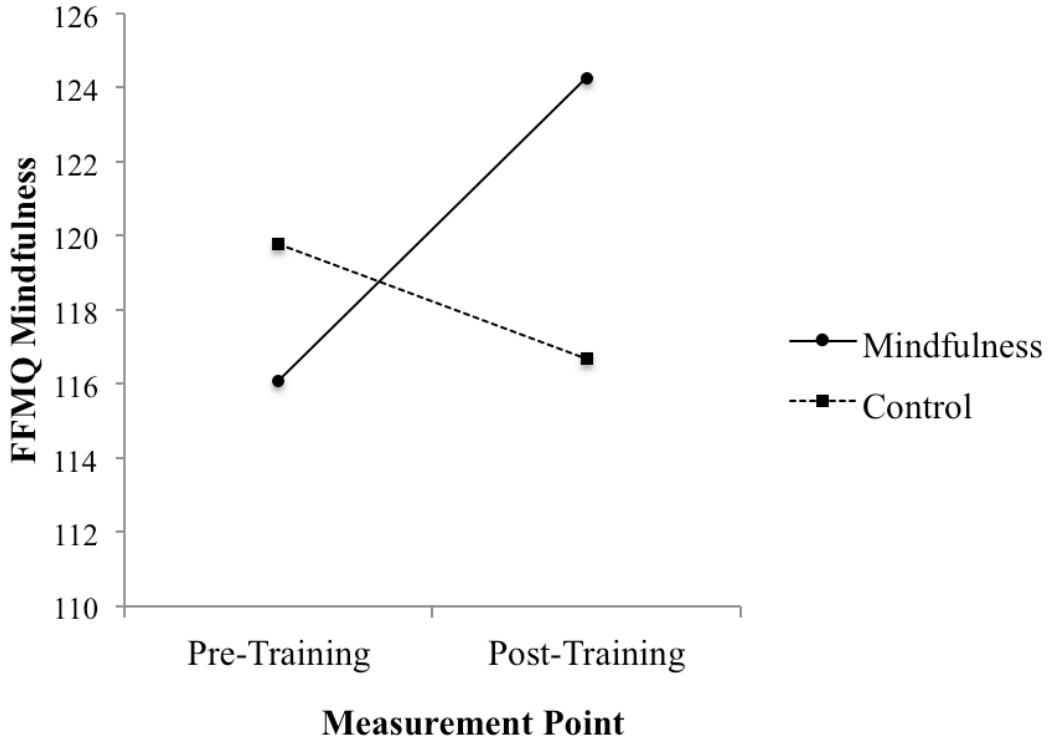

Figure 11. Comparing changes in total mindfulness from pre-training to post-training measurement points between the mindfulness group and the control group.

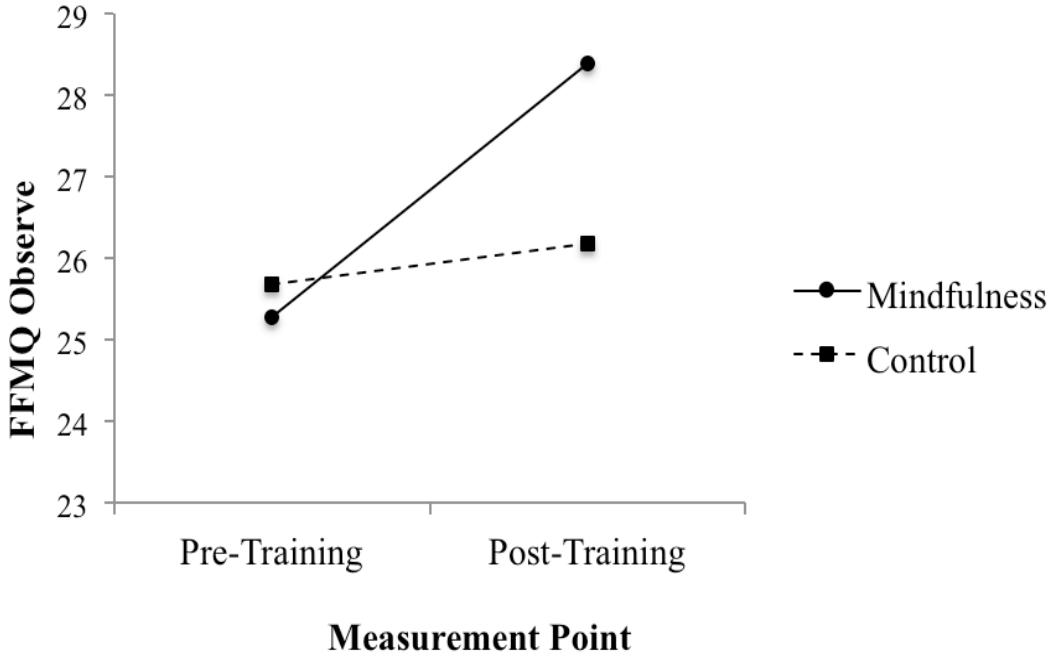

Figure 12. Comparing changes in the observe facet of mindfulness from pre-training to post-training measurement points between the mindfulness group and the control group.

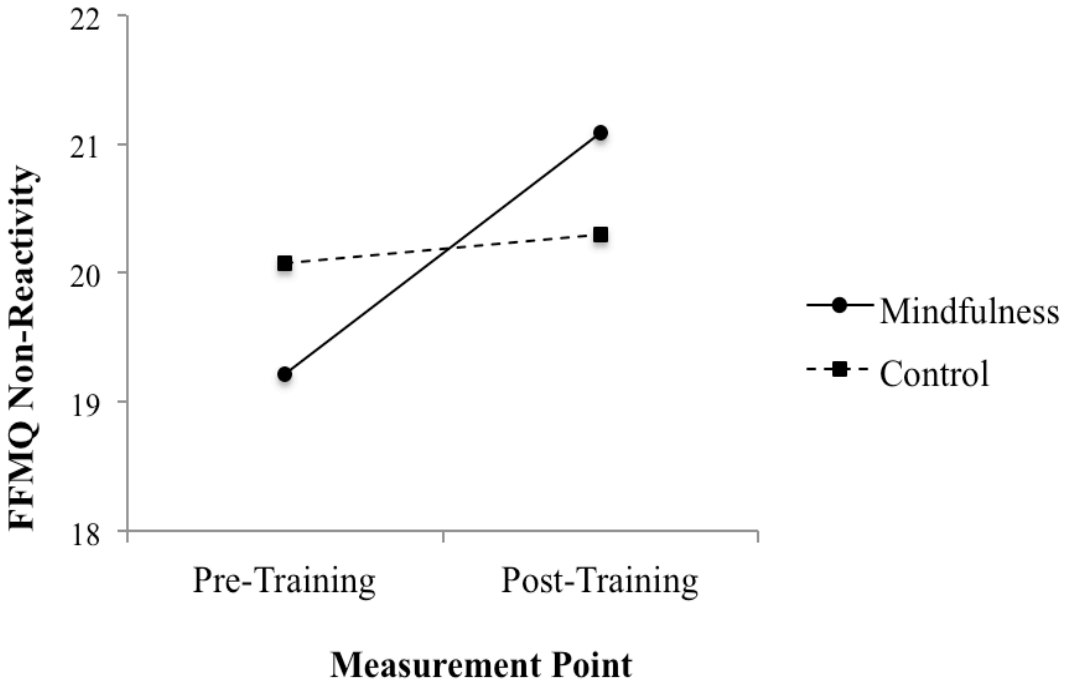

Figure 13. Comparing changes in the non-reactivity facet of mindfulness from pre-training to post-training measurement points between the mindfulness group and the control group.

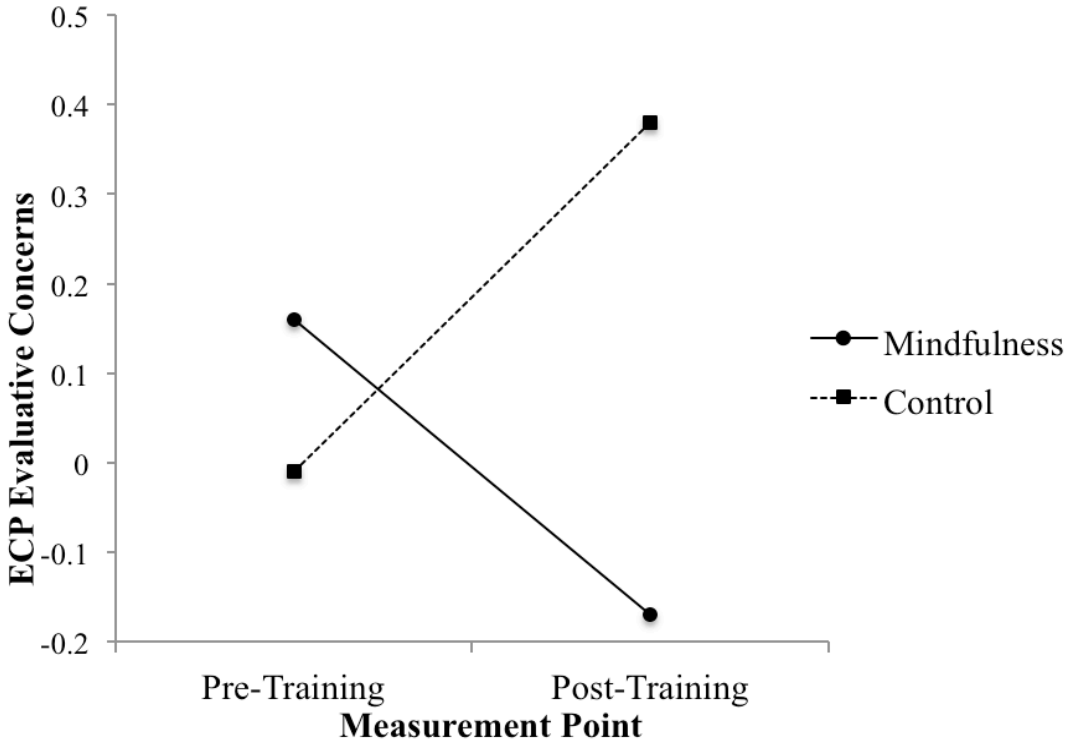

Figure 14. Comparing changes in evaluative concerns perfectionism from pre-training to post-training measurement points between the mindfulness group and the control group.

Changes in adaptive outcomes. The findings from the 2 × 2 ANOVAs comparing changes in levels of the adaptive outcomes between the mindfulness group and control group over the training period are presented in Table 12. Academic average was not included in these analyses due to a large amount of missing data. Further, given that many university classes do not provide frequent academic feedback, students may not be aware of changes in academic average over four weeks.

In terms of self-regulation, the results indicated no main effect of group, no main effect of time, and no group × time interaction. Therefore, the mindfulness group and the control group did not change in levels of self-regulation over the training period.

The findings comparing intrinsic motivation indicated no main effect of group, no main effect of time, and no group × time interaction. The mindfulness group and the control group did not change in levels of intrinsic motivation over the training period.

Similarly, the results comparing extrinsic motivation indicated no main effect of group, no main effect of time, and no group × time interaction. Thus, the mindfulness group and the control group did not change in levels of extrinsic motivation over the training period.

In terms of amotivation, the findings indicated no main effect of group and no group × time interaction. However, there was a main effect of time, suggesting that both groups increased in amotivation from pre-training to post-training ($\eta^2 = .11$, medium effect).

The findings comparing satisfaction with life indicated no main effect of group, no main effect of time, and no group × time interaction. Thus, the mindfulness group and the control group did not change in levels of life satisfaction over the training period.

Table 12

Results of 2-Between (Mindfulness, Control) x 2-Within (Pre-Training, Post-Training) ANOVAs Comparing Changes in Adaptive Outcomes

Variable	Mindfulness (n = 23)	Control (n = 25)	ANOVA	F	p	Partial η^2
SCMS Self-Regulation						
Pre-training	50.38	51.39	Time	0.01	.97	.00
Post-training	51.74	49.94	Group	0.01	.91	.00
Difference	1.36	-1.45	T x G	0.90	.35	.02
AMS Intrinsic Motivation						
Pre-training	57.13	57.09	Time	0.07	.79	.00
Post-training	54.30	58.85	Group	0.29	.59	.01
Difference	-2.83	1.76	T x G	1.30	.26	.03
AMS Extrinsic Motivation						
Pre-training	66.04	64.46	Time	0.15	.70	.00
Post-training	65.10	66.62	Group	0.02	.95	.00
Difference	-0.94	2.16	T x G	0.97	.33	.02
AMS Amotivation						
Pre-training	6.53	6.88	Time	5.73*	.02	.11
Post-training	8.70	8.13	Group	0.01	.91	.00
Difference	2.17	1.25	T x G	0.41	.53	.01
BMSLSS Life Satisfaction						
Pre-training	5.01	5.21	Time	3.64	.06	.08
Post-training	4.74	4.83	Group	0.19	.67	.00
Difference	-0.27	-0.38	T x G	0.10	.75	.00
PANAS Positive Affect						
Pre-training	31.13	32.17	Time	2.25	.14	.05
Post-training	30.70	29.36	Group	0.01	.94	.00
Difference	-0.43	-2.81	T x G	1.21	.28	.03
Goal Achievement						
Pre-training	34.76	32.21	Time	0.02	.88	.00
Post-training	34.38	33.13	Group	0.64	.43	.02
Difference	-0.38	0.92	T x G	0.14	.71	.00
Satisfaction with Average						
Pre-training	3.24	3.30	Time	1.51	.23	.04
Post-training	3.14	2.95	Group	0.05	.83	.00
Difference	-0.10	-0.35	T x G	0.50	.49	.01

*p < .05; **p < .01

When levels of positive affect were compared, the findings indicated no main effect of group, no main effect of time, and no group × time interaction. The mindfulness group and the control group did not change in positive affect over the training period.

In terms of academic goal achievement, the findings indicated no main effect of group, no main effect of time, and no group × time interaction. Thus, the mindfulness group and the control group did not change in goal achievement over the training period.

The findings comparing levels of satisfaction with academic average indicated no main effect of group, no main effect of time, and no group × time interaction. Thus, the mindfulness group and the control group did not change in levels of satisfaction with academic average over the training period.

Changes in maladaptive outcomes. The findings of the 2 × 2 ANOVAs comparing changes in levels of the maladaptive outcomes between the mindfulness group and control group over the training period are presented in Table 13.

When levels of negative affect were compared, the findings indicated no main effect of group and no main effect of time, but a group (mindfulness, control) x time (pre-training, post-training) interaction ($\eta^2 = .09$, medium effect; see Figure 15). Although the control group increased in negative affect ($t = -2.15$, $p < .05$), the mindfulness group did not change in levels of negative affect over the training period ($t = 0.87$, $p > .05$).

In terms of procrastination, the findings indicated no main effect of group, but a main effect of time and a group (mindfulness, control) x time (pre-training, post-training) interaction ($\eta^2 = .08$, small effect; see Figure 16). Although the control group increased in procrastination ($t = -2.78$, $p < .01$), the mindfulness group did not change in levels of procrastination over the training period ($t = -0.04$, $p > .05$).

The results comparing levels of worry indicated no main effect of group, no main effect of time, and no group (mindfulness, control) x time (pre-training, post-training) interaction. Thus, the mindfulness group and the control group did not change in levels of worry over the training period.

The findings comparing rumination indicated no main effect of group and no main effect of time, but a group (mindfulness, control) x time (pre-training, post-training) interaction ($\eta^2 = .10$, medium effect; see Figure 17). Although the control group increased in rumination ($t = -2.03$, $p < .05$), the mindfulness group did not change in levels of rumination over the training period ($t = 1.17$, $p > .05$).

When levels of depression were compared, the findings indicated no main effect of group, no main effect of time, and no group (mindfulness, control) x time (pre-training, post-training) interaction. Thus, the mindfulness group and the control group did not change in levels of depression over the training period.

The findings comparing levels of anxiety indicated no main effect of group, no main effect of time, and no group (mindfulness, control) x time (pre-training, post-training) interaction. Thus, the mindfulness group and the control group did not change in levels of anxiety over the training period.

In terms of stress, the findings indicated no main effect of group and no main effect of times, but a group (mindfulness, control) x time (pre-training, post-training) interaction ($\eta^2 = .09$, medium effect; see Figure 18). Although the control group increased in stress ($t = -2.87$, $p < .01$), the mindfulness group did not change in levels of stress over the training period ($t = 0.52$, $p > .05$).

Table 13

Results of 2-Between (Mindfulness, Control) x 2-Within (Pre-Training, Post-Training) ANOVAs Comparing Changes in Maladaptive Outcomes

Variable	Mindfulness (n = 23)	Control (n = 25)	ANOVA	F	p	Partial η^2
PANAS Negative Affect						
Pre-training	23.32	21.49	Time	0.83	.37	.02
Post-training	22.31	24.00	Group	0.01	.97	.00
Difference	-1.01	2.52	T x G	4.56*	.04	.09
IPS Procrastination						
Pre-training	28.09	26.36	Time	4.04*	.05	.08
Post-training	28.12	29.21	Group	0.04	.84	.00
Difference	0.03	2.85	T x G	3.84*	.04	.08
PSWQ Worry						
Pre-training	55.89	51.33	Time	0.99	.33	.02
Post-training	55.79	54.24	Group	0.63	.43	.01
Difference	-0.10	2.91	T x G	1.13	.29	.02
RRS-B Rumination						
Pre-training	7.86	6.36	Time	0.31	.58	.01
Post-training	7.09	7.64	Group	0.37	.55	.01
Difference	-0.77	1.28	T x G	5.01*	.03	.10
DASS-21 Depression						
Pre-training	5.35	5.44	Time	2.19	.15	.05
Post-training	5.09	8.08	Group	1.28	.26	.03
Difference	-0.26	2.64	T x G	3.26	.08	.07
DASS-21 Anxiety						
Pre-training	5.87	5.52	Time	3.55	.07	.07
Post-training	6.09	7.59	Group	0.21	.65	.01
Difference	0.22	2.07	T x G	2.33	.13	.05
DASS-21 Stress						
Pre-training	7.21	6.48	Time	1.38	.25	.03
Post-training	6.56	8.88	Group	0.37	.55	.01
Difference	-0.65	2.40	T x G	4.20*	.04	.09

*$p < .05$; **$p < .01$

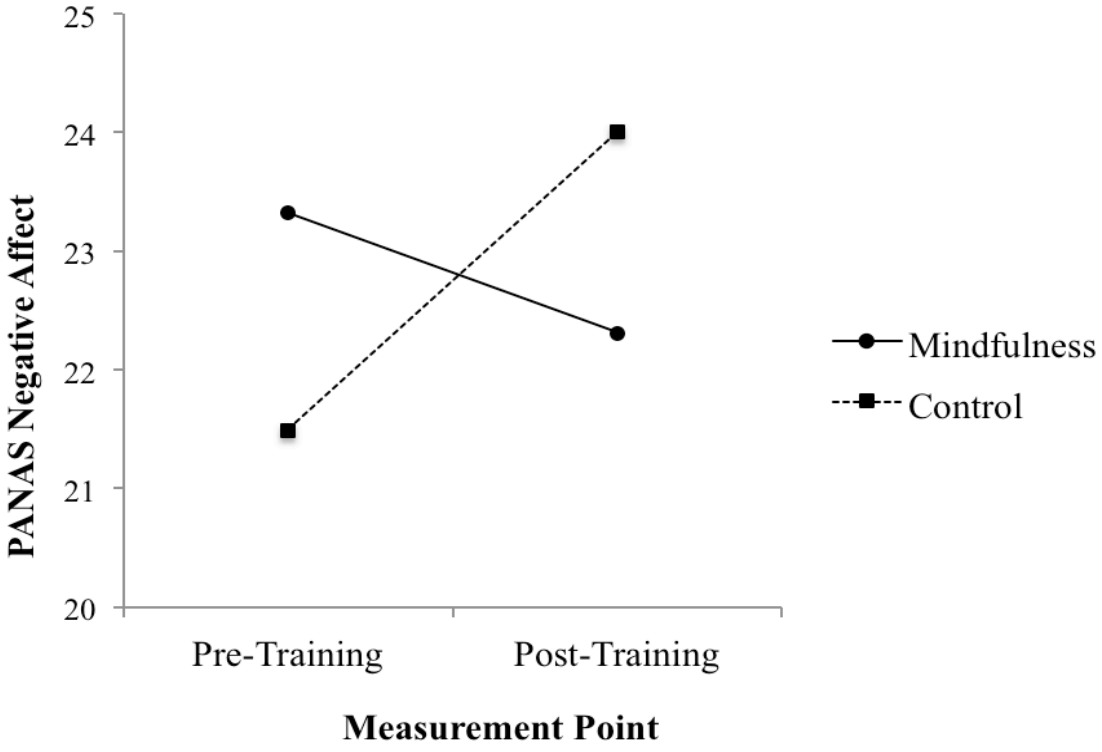

Figure 15. Comparing changes in negative affect from pre-training and post-training measurement points between the mindfulness group and control group.

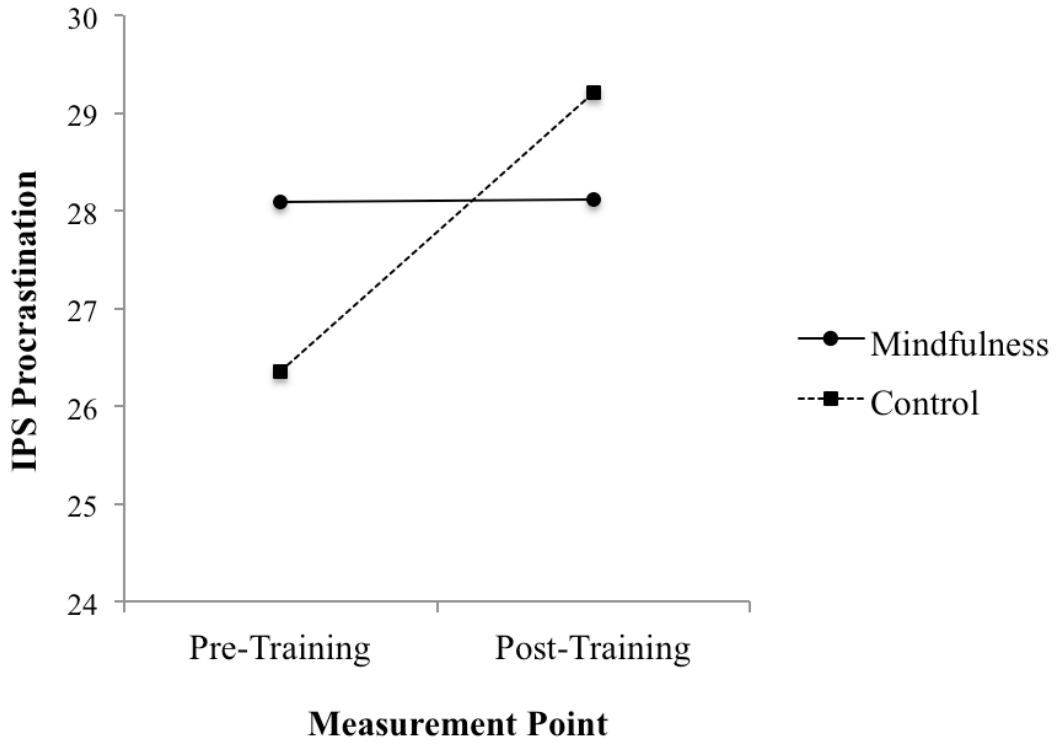

Figure 16. Comparing changes in procrastination from pre-training and post-training measurement points between the mindfulness group and control group.

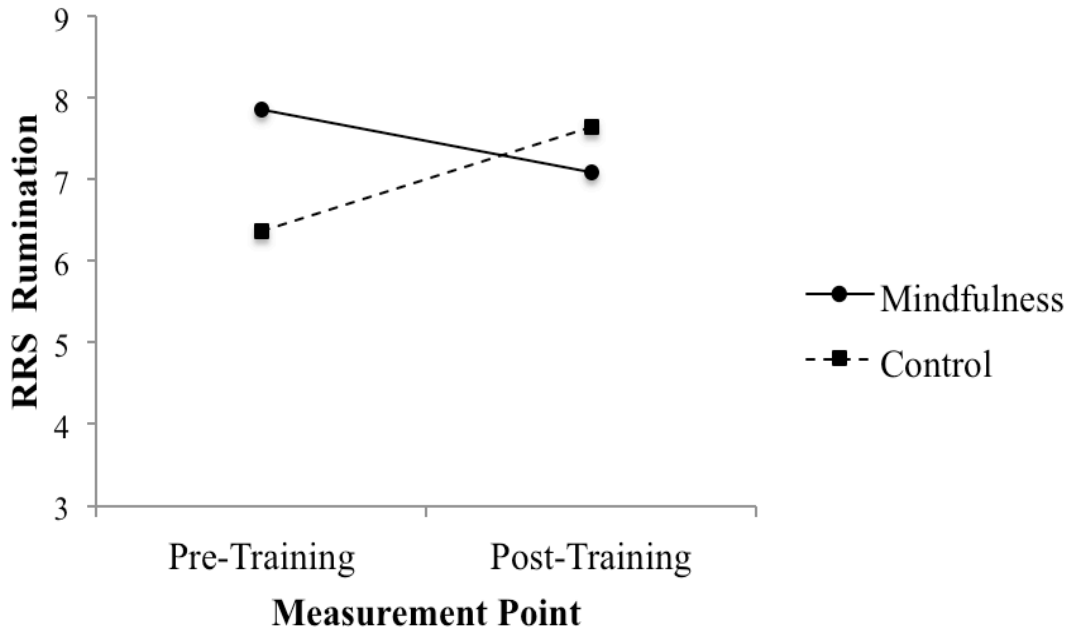

Figure 17. Comparing changes in rumination from pre-training and post-training measurement points between the mindfulness group and control group.

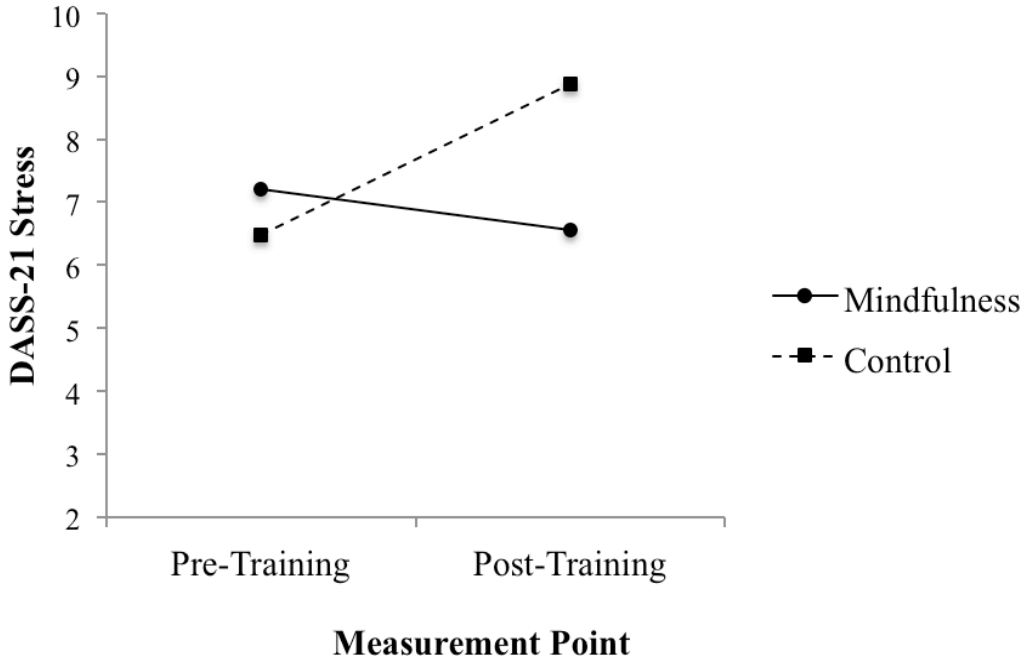

Figure 18. Comparing changes in stress from pre-training and post-training measurement points between the mindfulness group and control group.

Intent-to-treat analyses. An intent-to-treat approach preserves random assignment in randomized controlled trials by including every participant who is randomized in the analyses, regardless if they completed or dropped out of the study. Thus, this approach accepts the assumption that non-completion and protocol deviations are likely to occur in practical settings (Gupta, 2011). However, this method is more conservative than completer analyses and tends to result in fewer significant findings and lower effect sizes. Thus, only findings that were significant during the completer analyses were examined with this approach (see Table 14). Of the 57 participants who were randomized, nine participants were removed from the completer analyses (six from the mindfulness group and three from the control group); however, four of the six participants excluded from the mindfulness group completed the post-training questionnaires. Thus, 52 participants (91.2%) completed the post-training questionnaires. For those who did not complete the post-training questionnaires ($n = 5$), pre-training responses were transferred to the post-training measurement point.

Independent sample *t*-tests were first conducted to compare pre-training scores between the mindfulness group and the control group. The results indicated that the groups did not differ on scores of mindfulness, evaluative concerns perfectionism, negative affect, procrastination, rumination, or stress ($t = -1.07 – 0.29$, $p > .05$).

Consistent with the completer analysis, intent-to-treat results comparing total mindfulness indicated no main effect of time and no main effect of group, but a group × time interaction ($\eta^2 = .14$, medium effect). Although the control group did not change in mindfulness ($t = 1.60$, $p > .05$), the mindfulness group increased in mindfulness over the training period ($t = -2.57$, $p < .05$).

The intent-to-treat findings comparing evaluative concerns perfectionism indicated no main effect of group and no main effect of time. However, unlike the completer analysis, there was no group × time interaction. This finding suggests that the mindfulness group and the control group did not change in levels of evaluative concerns over the training period.

Like the completer analysis, the intent-to-treat results for negative affect indicated no main effect of time and no main effect of group, but a group × time interaction (η^2 = .09, medium effect). Although the control group increased in negative affect (t = -2.13, p < .05), the mindfulness group did not change in negative affective over the training period (t = 1.01, p > .05).

In line with the completer analysis, the intent-to-treat findings for procrastination indicated no group main effect; however, the group × time interaction was no longer present. There was a main effect of time, suggesting that both groups increased in procrastination from pre-training to post-training (η^2 = .11, medium effect).

Consistent with the completer analysis, the intent-to-treat findings for rumination indicated no main effect of time and no main effect of group, but a group × time interaction (η^2 = .07, small effect). Although the control group increased in rumination (t = -2.00, p < .05), the mindfulness group did not change in rumination over the training period (t = 0.77, p > .05).

Also consistent with the completer analysis, the intent-to-treat findings for stress indicated no main effect of time and no main effect of group, but a group × time interaction (η^2 = .10, medium effect). Although the control group increased in stress (t = -2.82, p < .01), the mindfulness group did not change in levels of stress over the training period (t = 0.89, p > .05).

Table 14

Intent-To-Treat Results of 2-Between (Mindfulness, Control) x 2-Within (Pre-Training, Post-Training) ANOVAs Testing Changes in Mindfulness, Perfectionism, and Maladaptive Outcomes

Variable	Mindfulness (n = 29)	Control (n = 28)	ANOVA	F	p	Partial η^2
FFMQ Total Mindfulness						
Pre-training	118.75	120.33	Time	1.60	.21	.03
Post-training	125.50	117.57	Group	0.36	.55	.01
Difference	6.75	-2.76	T x G	9.05**	.00	.14
ECP Evaluative Concerns						
Pre-training	-0.14	-0.02	Time	0.40	.53	.01
Post-training	-0.30	0.30	Group	0.52	.47	.01
Difference	-0.16	0.32	T x G	3.69	.06	.06
PANAS Negative Affect						
Pre-training	22.95	21.87	Time	0.85	.36	.02
Post-training	22.00	24.11	Group	0.06	.80	.00
Difference	-0.95	2.24	T x G	5.15*	.03	.09
IPS Procrastination						
Pre-training	28.14	26.39	Time	6.55*	.01	.11
Post-training	28.82	28.94	Group	0.28	.60	.01
Difference	0.68	2.55	T x G	2.18	.15	.04
RRS-B Rumination						
Pre-training	7.16	6.46	Time	0.77	.39	.01
Post-training	6.72	7.61	Group	0.02	.91	.00
Difference	-0.44	1.15	T x G	3.82*	.04	.07
DASS-21 Stress						
Pre-training	7.14	6.11	Time	0.97	.33	.02
Post-training	6.24	8.25	Group	0.17	.69	.00
Difference	-0.90	2.14	T x G	5.74*	.02	.10

*p < .05; **p < .01

Discussion

The aim of the current study was to investigate the stability of outcomes related to perfectionism. Specifically, a randomized controlled design tested whether adaptive outcomes (i.e., well-being, achievement, and motivation) and maladaptive outcomes (i.e., psychological distress, procrastination, and negative repetitive thought) changed in a group of students who completed mindfulness training compared to a control group that did not receive training. Additionally, changes in a five facet model of mindfulness were explored to clarify which facets may be more relevant to training in university students.

Mindfulness training resulted in a medium effect for increases in mindfulness, while the control group did not change in levels of total mindfulness. This finding supports hypothesis 1 of the current study. When changes in the separate facets were examined, meaningful effects were found for increases in the observe facet and the non-reactivity to experiences facet of mindfulness. Another study recently found similar results, such that mindfulness training for students completing their first year of university resulted in increases in observing, describing, and non-reactivity to experiences, but no increases in acting with awareness or non-judgment of experiences occurred (Ramler, Tennison, Lynch, & Murphy, 2015). This finding may be related to the fact that some research suggests that the observe facet of mindfulness is particularly sensitive to change with formal mindfulness experience (Baer et al., 2006). Therefore, it is possible that students in the mindfulness group learned skills in observing distressing experiences and refraining from impulsive reactions to these experiences.

The mindfulness group did not change in levels of personal standards perfectionism or evaluative concerns perfectionism and the control group did not change

in levels of personal standards perfectionism. However, although perfectionism is commonly considered a stable dispositional characteristic, the control group moderately increased in evaluative concerns perfectionism. Notably, other studies have reported fluctuations in levels of maladaptive perfectionism over the course of an academic semester in university students (Rice & Aldea, 2006). While there may not be absolute stability of perfectionism (i.e., changes in average group scores), it is suggested that the relative stability of perfectionism (i.e., correlation of perfectionism scores over time) and its correlations to other variables are unaltered over time among students (Rice & Aldea, 2006; Rice, Richardson, & Clark, 2012). For instance, another study indicated that correlations among perfectionism, procrastination, and psychological distress are consistent over three measurement points in a semester. Similar consistency was observed in the present study, as levels of adaptive perfectionism and adaptive outcomes did not change over the training period for the mindfulness group and control group; however, both levels of maladaptive perfectionism and many maladaptive outcomes increased over the training period for the control group.

The findings examining adaptive outcomes indicated that both the mindfulness group and the control group did not change in levels of self-regulation, intrinsic motivation, extrinsic motivation, life satisfaction, positive affect, goal achievement, and satisfaction with academic average. However, both groups increased in levels of amotivation. These findings do not support hypothesis 3 of the current study. In terms of maladaptive outcomes, both groups also did not change in levels of worry, depression, or anxiety; however, the control group increased in levels of negative affect, stress, rumination, and procrastination, while the mindfulness group did not change. These

findings partially support hypothesis 4 of this study. Thus, it appears that university students who did not complete mindfulness training experienced no changes in adaptive outcomes, but experienced increased maladaptive outcomes, particularly in negative affect, stress, rumination, and procrastination. Alternatively, students who completed the mindfulness training were protected against increases in maladaptive outcomes.

Given that over half of the mindfulness group and the control group were first year students, it may not be that surprising that increases in psychological distress and procrastination occurred. Transition to the first year of university typically involves a lower level of support and higher academic demands. Research indicates that stress predicts poor academic, social, and emotional adjustment during the first year of university (Friedlander, Reid, Shupak, & Cribbie, 2007). Consistent with our findings, a recent study indicated that a control group of first-year students experienced poorer emotional adjustment to university than first-year students who completed an adapted Mindfulness-Based Stress Reduction training program (Ramler et al., 2015). Also consistent with the current study, no differences were found between the groups in regards to academic adjustment (Ramler et al., 2015). The finding that mindfulness training did not result in enhanced subjective well-being, including levels of positive affect and life satisfaction, is also in line with previous research indicating that student's levels of positive affect remained unchanged after mindfulness-based cognitive therapy (Collard et al., 2008). Therefore, although four classes of mindfulness training did not enhance adaptive outcomes, it appeared to protect against increases in maladaptive outcomes.

Lastly, intent-to-treat analyses suggest that the majority of the findings of the current study are robust. Although this approach preserves random assignment, students who completed no training or only the first class were included in the mindfulness group and thus, reduced the potential effects of training. The small to medium effects for procrastination and evaluative concerns perfectionism were no longer present and the medium effect for rumination reduced to a small effect. However, the medium effects for mindfulness, negative affect, and stress were maintained.

Accumulating evidence suggests that high levels of maladaptive dimensions of perfectionism can act as a vulnerability factor to experiencing forms of psychological distress (Sherry, Richards, Sherry, & Stewart, 2014), and particularly in response to negative life events (Enns, Cox, & Clara, 2005). A longitudinal study conducted by Musquash and Sherry (2012) suggests that students high in socially prescribed perfectionism (i.e., a narrow dimension of evaluative concerns) tend to engage in cyclic patterns of self-defeating behaviours (e.g., procrastination), which can result in psychological distress. Recent research also suggests that mindfulness may be a protective factor in the link between maladaptive perfectionism and distress; however, most of this research examines dispositional levels of mindfulness. For instance, Short and Mazmanian (2013) indicated that although rumination mediates the relationship between socially prescribe perfectionism and negative affect for those low in dispositional mindfulness, the mediating effect of rumination is not present for those high in dispositional mindfulness. Although students in the mindfulness group did not increase or decrease in levels of adaptive and maladaptive outcomes, the current results are encouraging as they suggest that mindfulness training may be a protective factor. That is,

training in mindfulness, and particularly observing and non-reactivity, may help protect against some of the maladaptive outcomes experienced by university students, such as increased negative affect, rumination, stress, and procrastination.

Limitations and Future Research

Although the current findings are promising as they suggest protective effects of mindfulness training for university students, several limitations relevant to this study need to be considered. Similar to Study 1, this study employed many self-report outcome measures. Self-report data provides an individual's perspective of their functioning; however, this approach may be limited by poor recall and lack of insight into thoughts, emotions, and behaviors (Paulhus & Vazire, 2007). Utilizing instruments that do not rely on self-report, such as informant-report questionnaires, performance-based measures, and physiological indicators may be useful in subsequent studies. Assessing other outcomes (e.g., salivary cortisol samples as a stress index) and in other contexts (e.g., employment) could also help evaluate effects of mindfulness training that were potentially missed in the present study. Participants were recruited from undergraduate psychology classes, and while students majoring in other areas often enroll in the introductory psychology course, future research may wish to examine mindfulness training for perfectionistic students in specific disciplines (e.g., engineering, nursing). Moreover, it is possible that if students become better adjusted to university after their first year of study, mindfulness training may result in improvements in well-being and academic-related outcomes rather than having a protective effect.

A large proportion of the current sample were White, and although this aligns with the sample in Study 1 and other undergraduate samples, the low diversity in

ethnicity limits the ability to generalize the findings to students of other ethnicities and cultures. The sex composition of this sample was more balanced compared to Study 1 (70% females vs. 87% female), indicating that male students were interested in learning mindfulness. Few studies have addressed sex differences in mindfulness training. Some studies suggest no sex differences for the general population (e.g., Nyklicek & Kuijpers, 2008), while another study indicated greater reductions in stress for female compared to male undergraduate students (de Vibe et al., 2013). A larger study that specifically recruited males may help clarify whether sex is related to the effects of mindfulness training in students, and for what outcomes.

The protective role played by mindfulness training in the present study highlights the importance of including control groups to consider timing effects in intervention research. The four-week time period may have captured natural increases in maladaptive outcomes for students due to mid-term assignments or exams. Thus, the students in the mindfulness group were potentially better equipped at emotionally regulating their affect during this time. Although self-regulation of goal directed behaviour was examined in this study and did not change after mindfulness training, future studies might explore other possible mediators of change, such as emotion regulation. Examining mindfulness training in comparison to no training increased the ecological validity of the study, and the findings are more likely to represent the effects of a mindfulness program if implemented in a university context. Future research may wish to incorporate other control groups such as relaxation training or other traditional cognitive behavioural approaches, as research indicates that these programs are efficacious in managing stress among students (see Regehr, Glancy, & Pitts, 2013 for review). Additionally, the long-

term effects of the mindfulness program should be examined though the inclusion of follow-up assessments.

Findings from this study suggested that the greatest increases in mindfulness occurred for the facets of observing and non-reactivity. Future studies may examine whether certain mindfulness exercises, longer training programs, or greater amounts of home practice may relate to increases in other facets of mindfulness. Only six of the 23 participants that completed the mindfulness training submitted their home practice logs at the end of the study. Future research may consider other methods, such as submitting practice logs electronically, to more reliably measure home practice completion. Although students in the mindfulness group did not change in levels of outcomes for the current study, it is possible that increases in other facets, such as acting with awareness or non-judgment, may increase adaptive outcomes or decrease maladaptive outcomes. The four-week time frame employed in this study is consistent with mindfulness programs used in sport contexts (e.g., Mindful Sport Performance Enhancement; Kaufman et al., 2010). Further exploring frequency, intensity, setting, and types of mindfulness exercises are relevant to determine the dose-response curve regarding the benefits of mindfulness.

Future research may consider examining this mindfulness-training program in a larger sample of students in order to adequately evaluate the small effects of the training. Furthermore, to test the hypotheses of 2 × 2 model of perfectionism in predicting changes after mindfulness training, a larger sample and meaningful increases in adaptive outcomes and decreases in maladaptive outcomes in the mindfulness group are needed. Studies may also wish to compare different theoretical models of perfectionism (e.g., 2 × 2 model and tripartite model) in predicting outcomes after mindfulness training. Notably,

pre-training average total scores from the smaller sample of students in Study 2 ($N = 48$) were comparable to average total scores from the larger sample of students in Study 1 ($N = 240$) for the measures of perfectionism dimensions, mindfulness, and adaptive and maladaptive outcomes. Future research may specifically target students who are at greater risk of experiencing higher levels of adaptive and maladaptive outcomes during the semester, such as those high in personal standards perfectionism, those high in evaluative concerns perfectionism, or those high in both dimensions. Lastly, prevalence rates of clinical disorders among university students are elevated (e.g., 15.8% for Study 1 and 12.7% for a nation-wide study of college students in the United States; Keyes, Eisenberg, Perry, Dube, Kroenke, & Dhingra, 2012). Given that some researchers posit perfectionism as a transdiagnostic disposition across many clinical disorders (Egan, Wade, & Shafran, 2011), future studies may explore mindfulness training and programs that also include target emotional symptoms (e.g., MBCT) for perfectionistic students experiencing clinical levels of depression and anxiety.

Conclusion

Perfectionism that is characterized by high concerns over others' expectations and negative reactions to perceived failure is incompatible with dispositional levels of mindfulness. The findings from Study 2 explore this notion beyond dispositional mindfulness and suggest that training in this type of present-moment and non-reactive attention helps protect students from increasing levels of evaluative concerns perfectionism, negative affect, stress, rumination, and procrastination. Although training did not enhance adaptive outcomes, mindfulness practices might be directly applied to university settings to prevent maladaptive outcomes through skill-based learning and

public education workshops. Difficulties with adjusting to the elevated performance demands of university are often accompanied by increased negative affect and stress, particularly for first year students. Mindfulness training programs may possibly prevent the development of mood and anxiety disorders in those undergraduate students high in evaluative concerns.

GENERAL CONCLUSION

Recent theoretical models of perfectionism (i.e., 2 × 2 model) incorporate all possible combinations of perfectionism dimensions to examine both the adaptive and maladaptive outcomes of this disposition. Study 1 examined in what manner combinations of perfectionism dimensions predict adaptive outcomes and maladaptive outcomes over an academic semester. The findings largely supported the 2 × 2 model and provide theoretical implications for the conceptualization of perfectionism. Pure personal standards perfectionism predicted higher levels of adaptive outcomes and lower levels of maladaptive outcomes than no tendency towards perfectionism for many of the study variables. Pure evaluative concerns perfectionism predicted lower levels of adaptive outcomes and higher levels of maladaptive outcomes than no tendency towards perfectionism. Lastly, a mixed combination buffered both the adaptive benefits of high personal standards and the maladaptive effects of high evaluative concerns. Although some authors postulate that all dimensions of perfectionism are associated with psychological distress over time when one does not attain their goals (Hewitt & Flett, 2007), the results of this longitudinal study suggests that the 2 × 2 model provides a unique framework to reveal the differences between perfectionism combinations in terms of adaptive outcomes.

To further our understanding of how certain combinations of the 2 × 2 model result in adaptive and maladaptive outcomes, Study 1 also examined potential variables underlying these relationships. The meditation models examining the independent effects of evaluative concerns (i.e., pure evaluative concerns perfectionism) suggested that perfectionists who are concerned with being evaluated by others may worry about meeting expectations and ruminate when they perceive that those expectations are not met, which contributes to higher levels of negative affect. Similarly, these individuals have difficulties with self-regulating goal-directed behaviour, and are more likely to engage in procrastination. The mediation models examining the independent effects of personal standards (i.e., pure personal standards perfectionism) suggested that perfectionists who have high personal standards have a greater propensity towards mindful awareness of the present-moment, which contributes to higher levels of positive affect. These individuals are also more intrinsically motivated, and achieve greater academic goal achievement. Examining these underlying mechanisms further clarifies the processes of perfectionism in academic settings.

Considering the findings that perfectionism dimensions can predict both adaptive and maladaptive outcomes, exploring intervention approaches that are directed at modifying perfectionists' mindset surrounding their standards, rather than eliminating perfectionistic standards may prove useful. Thus, Study 2 examined whether mindfulness training, which fosters directing attention to the present moment in a non-judgmental and non-reactive way, is helpful for perfectionists when they fall short of their standards. Contrary to the study hypotheses, mindfulness training did not enhance adaptive outcomes or decrease maladaptive outcomes related to perfectionism. Rather, training

provided protective benefits over increasing in evaluative concerns perfectionism, procrastination, and psychological distress. Although this discussion goes beyond the results of the current investigation, it is possible that students who trained in mindfulness may be more resilient and have greater psychological resources to adjust to the high demands of university.

Findings from the current investigation have potential implications for prevention of psychological distress in academic contexts, and for students who have negative reactions to perceived failure and are overly concerned about others' expectations. Recent research shows some support for cognitive-behavioural interventions targeting elevated perfectionism dimensions within clinical disorders, such as anxiety, mood, and eating psychopathology (Lloyd et al., 2014). However, future research may wish to compare intervention approaches that encourage acceptance of one's performance (i.e., mindfulness interventions) to approaches that aim to change perfectionistic standards (i.e., cognitive-behavioural) for non-clinical populations, such as university students. The fact that mindfulness training is delivered in a group format also has practical implications for providing widespread services on university campuses to potentially help prevent psychological distress and procrastination among students.

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Appendix A

Demographic Information Form

Participant #: _____

Lakehead UNIVERSITY

Demographic Information

1. Age: _____

2. Sex: ____ Male ____ Female

3. Sexual Orientation: (circle the number that best applies)

0 = Exclusively heterosexual
1 = Predominantly heterosexual, only incidentally homosexual
2 = Predominantly heterosexual, but more than incidentally homosexual
3 = Equally heterosexual and homosexual
4 = Predominantly homosexual, but more than incidentally heterosexual
5 = Predominantly homosexual, only incidentally heterosexual
6 = Exclusively homosexual

4. Ethic Identity: Rank number all that apply (**1** for primary ethnicity, **2** for secondary, etc.)

_____Aboriginal (Inuit, Metis, North American Indian)

_____Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan)

_____Black (e.g., African, Haitian, Jamaican, Somali)

_____Chinese

_____Filipino

_____Japanese

_____Korean

_____Latin American

_____South Asian

_____South East Asian

_____White (Caucasian)

_____Other *please specify all that apply in order of ethnic identity (most to least)*

_____

5. Relationship Status:

_____ Married _____ Divorced _____ Committed Relationship _____ Single
_____ Other *please specify* _____

6. Where are you from?

_____ City (population of 10 000 or more)

_____ Town (population of 1 000 – 9999)

_____ Village (population of 100 – 999)

_____ Other (please specify)_____

7. Employment Status:

_____ Full-Time Employment

_____ Part-Time Employment

_____ Unemployed

8. Estimated annual *family* income:

_____$0 - $ 19, 999

_____$ 20, 000 - $39, 999

_____$ 40, 000 - $59, 999

_____$ 60, 000 - $79, 999

_____$ 80, 000 - $99, 999

_____$ 100, 000 - $119, 999

_____$ 120, 000 - $139, 999

_____$ 140, 000 - $159, 999

_____$ 160, 000 - $179, 999

_____$ 180, 000 - $199, 999

_____ greater than $200, 000

9. Educational Status:

_____ Full-Time Student

_____ Part-Time Student

10. Year of University:

_____ First Year _____ Second Year _____ Third Year _____ Fourth Year

_____Other *please specify*_____

11. Have you declared a Major? _____ Yes _____ No

If Yes, what is your major? _____

Note: If Psychology please indicate if science or arts.

12. Have you ever been diagnosed with a psychological, emotional, or psychiatric condition(s)? _____ Yes _____ No

If Yes, please list the name of the condition(s) (if known):

_____

13. Are you currently receiving counselling, therapy, or medication for a psychological, emotional, or psychiatric condition(s)?

_____ Counselling/Therapy _____ Medication _____ Neither

If you answered 'Counselling/Therapy' above, please list the name of the condition(s) which you are receiving counselling/therapy for and the type of counselling/therapy you are receiving (if known):

_____

_____

If you answered "Medication' above, please list the name of the condition(s) which you are receiving medication for and the type of medication you are receiving (if known):

_____

_____

14. Have you ever received any training with mindfulness or any other forms of meditation?

_____ Yes _____ No

If yes, please list the types of training and the duration of training:

_____

_____

Appendix B

Multidimensional Perfectionism Scale – HF

Lakehead UNIVERSITY

Participant #: _____

MPS-HF

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. Indicate what is generally (i.e., as in the past several years) true for you.

1 = Strongly disagree
2
3
4 = Undecided
5
6
7 = Strongly agree

		Strongly disagree			Undecided			Strongly agree
1.	When I am working on something, I cannot relax until it is perfect.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	I am not likely to criticize someone for giving up too easily.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	It is not important that people I am close to are successful.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	I seldom criticize my friends for accepting second best.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	I find it difficult to meet others' expectations of me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	One of my goals is to be perfect in everything I do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	Everything that others do must be of top-notch quality.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	I never aim for perfection in my work.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	Those around me readily accept that I can make mistakes too.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	It doesn't matter when someone close to me does not do their absolute best.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	The better I do, the better I am expected to do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

12.	I seldom feel the need to be perfect.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	Anything I do that is less than excellent will be seen as poor work by those around me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14.	I strive to be as perfect as I can be.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	It is very important that I am perfect in everything I attempt.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	I have high expectations for the people who are important to me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	I strive to be the best at everything I do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	The people around me expect me to succeed at everything I do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	I do not have very high standards for those around me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	I demand nothing less than perfection of myself.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	Others will like me even if I don't excel at everything.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	I can't be bothered with people who won't strive to better themselves.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	It makes me uneasy to see an error in my work.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	I do not expect a lot from my friends.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25.	Success means that I must work even harder to please others.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	If I ask someone to do something, I expect it to be done flawlessly.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27.	I cannot stand to see people close to me make mistakes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28.	I am perfectionistic in setting my goals.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
29.	The people who matter to me should never let me down.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
30.	Others think I am okay, even when I do not succeed.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
31.	I feel that people are too demanding of me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

32.	I must work to my full potential at all times.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
33.	Although they may not show it, other people get very upset with me when I slip up.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
34.	I do not have to be the best at whatever I am doing.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
35.	My family expects me to be perfect.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
36.	I do not have very high goals for myself.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
37.	My parents rarely expected me to excel in all aspects of my life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
38.	I respect people who are average.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
39.	People expect nothing less than perfection from me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
40.	I set very high standards for myself.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
41.	People expect more from me than I am capable of giving.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
42.	I must always be successful at school or work.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
43.	It does not matter to me when a close friend does not try their hardest.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
44.	People around me think I am still competent even if I make a mistake.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
45.	I seldom expect others to excel at whatever they do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Appendix C

Multidimensional Perfectionism Scale – F

Lakehead UNIVERSITY

Participant #: _____

MPS-F

Please choose the number that best corresponds to your agreement with each statement below. Indicate what is generally true (i.e., as in the past several years) for you.

0 = Strongly disagree
1
2
3
4
5 = Strongly agree

		Strongly disagree				Strongly agree
1.	My parents set very high standards for me.	**1**	**2**	**3**	**4**	**5**
2.	Organization is very important to me.	**1**	**2**	**3**	**4**	**5**
3.	As a child, I was punished for doing thing less than perfectly.	**1**	**2**	**3**	**4**	**5**
4.	If I do not set the highest standards for myself, I am likely to end up a second rate person.	**1**	**2**	**3**	**4**	**5**
5.	My parents never tried to understand my mistakes.	**1**	**2**	**3**	**4**	**5**
6.	It is important to me that I be thoroughly competent in everything I do.	**1**	**2**	**3**	**4**	**5**
7.	I am a neat person.	**1**	**2**	**3**	**4**	**5**
8.	I try to be an organized person.	**1**	**2**	**3**	**4**	**5**
9.	If I fail at work/school, I am a failure as a person.	**1**	**2**	**3**	**4**	**5**
10.	I should be upset if I make a mistake.	**1**	**2**	**3**	**4**	**5**
11.	My parents wanted me to be the best at everything.	**1**	**2**	**3**	**4**	**5**

12.	I set higher goals for myself than most people.	**1**	**2**	**3**	**4**	**5**
13.	If someone does a task at work/school better than me, then I feel like I failed the whole task.	**1**	**2**	**3**	**4**	**5**
14.	If I fail partly, it is as bad as being a complete failure.	**1**	**2**	**3**	**4**	**5**
15.	Only outstanding performance is good enough in my family.	**1**	**2**	**3**	**4**	**5**
16.	I am very good at focusing my efforts on attaining a goal.	**1**	**2**	**3**	**4**	**5**
17.	Even when I do something very carefully, I often feel that it is not quite done right.	**1**	**2**	**3**	**4**	**5**
18.	I hate being less than the best at things.	**1**	**2**	**3**	**4**	**5**
19	I have extremely high goals.	**1**	**2**	**3**	**4**	**5**
20.	My parents have expected excellence from me.	**1**	**2**	**3**	**4**	**5**
21.	People will probably thing less of me if I make a mistake.	**1**	**2**	**3**	**4**	**5**
22.	I never felt like I could meet my parents' expectations.	**1**	**2**	**3**	**4**	**5**
23.	If I do not do as well as other people, it means am an inferior human being.	**1**	**2**	**3**	**4**	**5**
24.	Other people seem to accept lower standards from themselves than I do.	**1**	**2**	**3**	**4**	**5**
25.	If I do not do well all the time, people will not respect me.	**1**	**2**	**3**	**4**	**5**
26.	My parents have always had higher expectations for my future than I have.	**1**	**2**	**3**	**4**	**5**
27.	I try to be a neat person.	**1**	**2**	**3**	**4**	**5**
28.	I usually have doubts about the simple everyday things I do.	**1**	**2**	**3**	**4**	**5**
29.	Neatness is very important to me.	**1**	**2**	**3**	**4**	**5**
30.	I expect higher performance in my daily tasks than most people.	**1**	**2**	**3**	**4**	**5**
31.	I am an organized person.	**1**	**2**	**3**	**4**	**5**

32.	I tend to get behind in my work because I repeat things over and over.	**1**	**2**	**3**	**4**	**5**
33.	It takes me a long time to do something “right”.	**1**	**2**	**3**	**4**	**5**
34.	The fewer mistakes I make, the more people will like me.	**1**	**2**	**3**	**4**	**5**
35.	I never felt like I could meet my parents’ standards.	**1**	**2**	**3**	**4**	**5**

Appendix D

Five Facet Mindfulness Questionnaire

Lakehead UNIVERSITY

Participant #: _____

FFMQ

Please rate each of the following statements using the scale provided. Circle the number that best describes your own opinion of what is true for you during the past few weeks.

1 = Never or very rarely true
2 = Rarely true
3 = Sometimes true
4 = Often true
5 = Very often or always true

		Never true	Rarely true	Sometimes true	Often true	Always true
1.	When I'm walking, I deliberately notice the sensations of my body moving.	**1**	**2**	**3**	**4**	**5**
2.	I'm good at finding words to describe my feelings.	**1**	**2**	**3**	**4**	**5**
3.	I criticize myself for having irrational or inappropriate emotions.	**1**	**2**	**3**	**4**	**5**
4.	I perceive my feelings and emotions without having to react to them.	**1**	**2**	**3**	**4**	**5**
5.	When I do things, my mind wanders off and I'm easily distracted	**1**	**2**	**3**	**4**	**5**
6.	When I take a shower or bath, I stay alert to the sensations of water on my body.	**1**	**2**	**3**	**4**	**5**
7.	I can easily put my beliefs, opinions, and expectations into words.	**1**	**2**	**3**	**4**	**5**
8.	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.	**1**	**2**	**3**	**4**	**5**
9.	I watch my feelings without getting lost in them.	**1**	**2**	**3**	**4**	**5**
10.	I tell myself I shouldn't be feeling the way I'm feeling.	**1**	**2**	**3**	**4**	**5**
11.	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.	**1**	**2**	**3**	**4**	**5**
12.	It's hard for me to find the words to describe what I'm thinking.	**1**	**2**	**3**	**4**	**5**

13.	I am easily distracted.	**1**	**2**	**3**	**4**	**5**
14.	I believe some of my thoughts are abnormal or bad and I shouldn't think that way.	**1**	**2**	**3**	**4**	**5**
15.	I pay attention to sensations, such as the wind in my hair or sun on my face.	**1**	**2**	**3**	**4**	**5**
16.	I have trouble thinking of the right words to express how I feel about things	**1**	**2**	**3**	**4**	**5**
17.	I make judgments about whether my thoughts are good or bad.	**1**	**2**	**3**	**4**	**5**
18.	I find it difficult to stay focused on what's happening in the present.	**1**	**2**	**3**	**4**	**5**
19.	When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.	**1**	**2**	**3**	**4**	**5**
20.	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.	**1**	**2**	**3**	**4**	**5**
21.	In difficult situations, I can pause without immediately reacting.	**1**	**2**	**3**	**4**	**5**
22.	When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.	**1**	**2**	**3**	**4**	**5**
23.	It seems I am "running on automatic" without much awareness of what I'm doing.	**1**	**2**	**3**	**4**	**5**
24.	When I have distressing thoughts or images, I feel calm soon after.	**1**	**2**	**3**	**4**	**5**
25.	I tell myself that I shouldn't be thinking the way I'm thinking.	**1**	**2**	**3**	**4**	**5**
26.	I notice the smells and aromas of things.	**1**	**2**	**3**	**4**	**5**
27.	Even when I'm feeling terribly upset, I can find a way to put it into words.	**1**	**2**	**3**	**4**	**5**
28.	I rush through activities without being really attentive to them.	**1**	**2**	**3**	**4**	**5**
29.	When I have distressing thoughts or images I am able just to notice them without reacting.	**1**	**2**	**3**	**4**	**5**
30.	I think some of my emotions are bad or inappropriate and I shouldn't feel them.	**1**	**2**	**3**	**4**	**5**
31.	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.	**1**	**2**	**3**	**4**	**5**
32.	My natural tendency is to put my experiences into words.	**1**	**2**	**3**	**4**	**5**

33.	When I have distressing thoughts or images, I just notice them and let them go.	**1**	**2**	**3**	**4**	**5**
34.	I do jobs or tasks automatically without being aware of what I'm doing.	**1**	**2**	**3**	**4**	**5**
35.	When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.	**1**	**2**	**3**	**4**	**5**
36.	I pay attention to how my emotions affect my thoughts and behavior.	**1**	**2**	**3**	**4**	**5**
37.	I can usually describe how I feel at the moment in considerable detail.	**1**	**2**	**3**	**4**	**5**
38.	I find myself doing things without paying attention.	**1**	**2**	**3**	**4**	**5**
39.	I disapprove of myself when I have irrational ideas.	**1**	**2**	**3**	**4**	**5**

Appendix E

Brief Multidimensional Student Life Satisfaction Scale – College Version

Lakehead UNIVERSITY

Participant #: _____

BMSLSS-C

Read each item below and decide to what extent you are satisfied with each domain of your life during the past few weeks.

1 = Terrible
2 = Unhappy
3 = Mostly dissatisfied
4 = Mixed (about equally satisfied and dissatisfied)
5 = Mostly satisfied
6 = Pleased
7 = Delighted

		Terrible	Unhappy	Mostly dissatisfied	Mixed	Mostly Satisfied	Pleased	Delighted
1.	I would describe my satisfaction with my **family life** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	I would describe my satisfaction with my **friendships** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	I would describe my satisfaction with my **school experience** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	I would describe my satisfaction with **myself** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	I would describe my satisfaction with **where I live** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	I would describe my satisfaction with my **romantic relationships** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	I would describe my satisfaction with my **physical appearance** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	I would describe my satisfaction with my **overall life** as	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Appendix F

Positive and Negative Affect Schedule

Lakehead UNIVERSITY

Participant #: _____

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you have felt this way during the past few weeks.

1 = Very slightly or not at all
2 = A little
3 = Moderately
4 = Quite a bit
5 = Extremely

	Very slightly	A little	Moderately	Quite a bit	Extremely
1. Interested	**1**	**2**	**3**	**4**	**5**
2. Distressed	**1**	**2**	**3**	**4**	**5**
3. Excited	**1**	**2**	**3**	**4**	**5**
4. Upset	**1**	**2**	**3**	**4**	**5**
5. Strong	**1**	**2**	**3**	**4**	**5**
6. Guilty	**1**	**2**	**3**	**4**	**5**
7. Scared	**1**	**2**	**3**	**4**	**5**
8. Hostile	**1**	**2**	**3**	**4**	**5**
9. Enthusiastic	**1**	**2**	**3**	**4**	**5**
10. Proud	**1**	**2**	**3**	**4**	**5**
11. Irritable	**1**	**2**	**3**	**4**	**5**
12. Alert	**1**	**2**	**3**	**4**	**5**

13.	Ashamed	**1**	**2**	**3**	**4**	**5**
14.	Inspired	**1**	**2**	**3**	**4**	**5**
15.	Nervous	**1**	**2**	**3**	**4**	**5**
16.	Determined	**1**	**2**	**3**	**4**	**5**
17.	Attentive	**1**	**2**	**3**	**4**	**5**
18.	Jittery	**1**	**2**	**3**	**4**	**5**
19.	Active	**1**	**2**	**3**	**4**	**5**
20.	Afraid	**1**	**2**	**3**	**4**	**5**

Appendix G

Academic Achievement Questions

Participant #: _____

Lakehead UNIVERSITY

Academic Performance

Please respond to the following questions regarding your current academic performance and goals.

1. **What is your current Grade Point Average (GPA)? _____**

   What scale is your GPA rated on (e.g., 4.0)? _____

   How satisfied are you with your current GPA? (Circle the number that best applies)

   1 = Very dissatisfied
   2 = Dissatisfied
   3 = Not sure
   4 = Satisfied
   5 = Very satisfied

2. **What is your overall academic average? _____**

   How satisfied are you with your overall academic average? (Circle the number that best applies)

   1 = Very dissatisfied
   2 = Dissatisfied
   3 = Not sure
   4 = Satisfied
   5 = Very satisfied

3. **Please list two important academic goals for this semester:**

   Goal #1

   _____

_____

_____

To what extent have you attained this goal? (Circle the number that best applies)

1 2 3 4 5 6 7 8 9

Not at all Totally

To what extent have you made progress in the pursuit of this goal? (Circle the number that best applies)

1 2 3 4 5 6 7 8 9

Not at all Totally

To what extent are you satisfied with the progress made in the pursuit of this goal? (Circle the number that best applies)

1 2 3 4 5 6 7 8 9

Not at all Totally

Goal #2

_____

_____

_____

To what extent have you attained this goal? (Circle the number that best applies)

1 2 3 4 5 6 7 8 9

Not at all Totally

To what extent have you made progress in the pursuit of this goal? (Circle the number that best applies)

1	2	3	4	5	6	7	8	9
Not at all								Totally

To what extent are you satisfied with the progress made in the pursuit of this goal? (Circle the number that best applies)

1	2	3	4	5	6	7	8	9
Not at all								Totally

Appendix H

Self-Control Self-Management Scale

Lakehead UNIVERSITY

Participant #: _____

SCMS

Please read each of the following statements and rate how well each statement describes you during the past few weeks, using the following scale:

0 = Very undescriptive of me
1 = Somewhat/mostly undescriptive of me
2 = A little undescriptive of me
3 = A little descriptive of me
4 = Somewhat/mostly descriptive of me
5 = Very descriptive of me

		Very undescriptive of me	Mostly undescriptive of me	A little undescriptive of me	A little descriptive of me	Mostly descriptive of me	Very descriptive of me
1.	When I work toward something, it gets all my attention.	**0**	**1**	**2**	**3**	**4**	**5**
2.	The goals I achieve do not mean much to me.	**0**	**1**	**2**	**3**	**4**	**5**
3.	I become very aware of what I am doing when I am working towards a goal.	**0**	**1**	**2**	**3**	**4**	**5**
4.	I get myself through hard things by planning to enjoy myself afterwards.	**0**	**1**	**2**	**3**	**4**	**5**
5.	I know I can track my behaviour when working towards a goal.	**0**	**1**	**2**	**3**	**4**	**5**
6.	When I set important goals for myself, I usually do not achieve them.	**0**	**1**	**2**	**3**	**4**	**5**
7.	When I do something right, I take time to enjoy the feeling.	**0**	**1**	**2**	**3**	**4**	**5**
8.	I pay close attention to my thoughts when I am working on something hard.	**0**	**1**	**2**	**3**	**4**	**5**
9.	I silently praise myself even when others do not praise me.	**0**	**1**	**2**	**3**	**4**	**5**
10.	I do not seem capable of making clear plans for most problems that come up in my life.	**0**	**1**	**2**	**3**	**4**	**5**
11.	I make sure to track my progress regularly when I am working on a goal.	**0**	**1**	**2**	**3**	**4**	**5**

12.	The standards I set for myself are unclear and make it hard for me to judge how I am doing on a task.	**0**	**1**	**2**	**3**	**4**	**5**
13.	I congratulate myself when I make some progress.	**0**	**1**	**2**	**3**	**4**	**5**
14.	I keep focused on tasks I need to do even if I do not like them.	**0**	**1**	**2**	**3**	**4**	**5**
15.	I have learned that it is useless to make plans.	**0**	**1**	**2**	**3**	**4**	**5**
16.	I give myself something special when I make some progress.	**0**	**1**	**2**	**3**	**4**	**5**

Appendix I

Academic Motivation Scale – College Version

Lakehead UNIVERSITY

Participant #: _____

AMS-C

Using the scale below, indicate to what extent each of the following items presently corresponds to one of the reasons why you go to university. Please base your responses on how you have felt during the past few weeks.

1 = Does not correspond at all
2
3
4 = Corresponds moderately
5
6
7 = Corresponds exactly

	Why do you go to university?	**Does not correspond at all**						**Corresponds exactly**
1.	Because with only a high-school degree I would not find a high-paying job later on.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	Because I experience pleasure and satisfaction while learning new things.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	Because I think that a university education will help me better prepare for the career I have chosen.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	For the intense feelings I experience when I am communicating my own ideas to others.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	Honestly, I don't know; I really feel that I am wasting my time in school.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	For the pleasure I experience while surpassing myself in my studies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	To prove to myself that I am capable of completing my university degree.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	In order to obtain a more prestigious job later on.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	For the pleasure I experience when I discover new things never seen before.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	Because eventually it will enable me to enter the job market in a field that I like.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

11.	For the pleasure that I experience when I read interesting authors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	I once had good reasons for going to university; however, now I wonder whether I should continue.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14.	Because of the fact that when I succeed in university I feel important.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	Because I want to have "the good life" later on.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	Because this will help me make a better choice regarding my career orientation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	For the pleasure that I experience when I feel completely absorbed by what certain authors have written.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	I can't see why I go to university and frankly, I couldn't care less.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	To show myself that I am an intelligent person.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	In order to have a better salary later on.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	Because my studies allow me to continue to learn about many things that interest me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	Because I believe that a few additional years of education will improve my competence as a worker.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25.	For the "high" feeling that I experience while reading about various interesting subjects.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	I don't know; I can't understand what I am doing in school.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27.	Because university allows me to experience a personal satisfaction in my quest for excellence in my studies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28.	Because I want to show myself that I can succeed in my studies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Appendix J

Depression Anxiety Stress Scales – 21

Lakehead UNIVERSITY

Participant #: _____

DASS-21

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you during the past few weeks. There are no right or wrong answers. Do not spend too much time on any statement.

0 = Did not apply to me at all
1 = Applied to me to some degree, or some of the time
2 = Applied to me to a considerable degree, or a good part of time
3 = Applied to me very much, or most of the time

		Not at all	To some degree	To a considerable degree	Very much
1.	I found it hard to wind down.	**0**	**1**	**2**	**3**
2.	I was aware of dryness of my mouth.	**0**	**1**	**2**	**3**
3.	I couldn't seem to experience any positive feeling at all.	**0**	**1**	**2**	**3**
4.	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	**0**	**1**	**2**	**3**
5.	I found it difficult to work up the initiative to do things.	**0**	**1**	**2**	**3**
6.	I tended to over-react to situations.	**0**	**1**	**2**	**3**
7.	I experienced trembling (e.g., in the hands).	**0**	**1**	**2**	**3**
8.	I felt that I was using a lot of nervous energy.	**0**	**1**	**2**	**3**
9.	I was worried about situations in which I might panic and make a fool of myself.	**0**	**1**	**2**	**3**
10.	I felt that I had nothing to look forward to.	**0**	**1**	**2**	**3**

11.	I found myself getting agitated.	**0**	**1**	**2**	**3**
12.	I found it difficult to relax.	**0**	**1**	**2**	**3**
13.	I felt down-hearted and blue.	**0**	**1**	**2**	**3**
14.	I was intolerant of anything that kept me from getting on with what I was doing.	**0**	**1**	**2**	**3**
15.	I felt I was close to panic.	**0**	**1**	**2**	**3**
16.	I was unable to become enthusiastic about anything.	**0**	**1**	**2**	**3**
17.	I felt I wasn't worth much as a person.	**0**	**1**	**2**	**3**
18.	I felt that I was rather touchy.	**0**	**1**	**2**	**3**
19.	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).	**0**	**1**	**2**	**3**
20.	I felt scared without any good reason.	**0**	**1**	**2**	**3**
21.	I felt that life was meaningless.	**0**	**1**	**2**	**3**

Appendix K

Irrational Procrastination Scale

Lakehead UNIVERSITY

Participant #: _____

IPS

Please rate each of the following statements using the scale provided. Circle the number that best describes your own opinion of what is true for you during the past few weeks.

1 = Not (or very seldom) true
2 = Seldom true
3 = Sometimes true
4 = Often true
5 = Very often (or always) true

		Not true	Seldom true	Sometimes true	Often true	Always true
1.	I put things off so long that my well-being or efficiency unnecessarily suffers.	**1**	**2**	**3**	**4**	**5**
2.	If there is something I should do, I get to it before attending to lesser tasks.	**1**	**2**	**3**	**4**	**5**
3.	My life would be better if I did some activities or tasks earlier.	**1**	**2**	**3**	**4**	**5**
4.	When I should be doing one thing, I will do another.	**1**	**2**	**3**	**4**	**5**
5.	At the end of the day, I know I could have spent the time better.	**1**	**2**	**3**	**4**	**5**
6.	I spend my time wisely.	**1**	**2**	**3**	**4**	**5**
7.	I delay tasks beyond what is reasonable.	**1**	**2**	**3**	**4**	**5**
8.	I procrastinate.	**1**	**2**	**3**	**4**	**5**
9.	I do everything when I believe it needs to be done.	**1**	**2**	**3**	**4**	**5**

Appendix L

Penn State Worry Questionnaire

Lakehead UNIVERSITY

Participant #: _____

PSWQ

Circle the number that best describes how typical each item is of you during the past few weeks.						
1 = Not at all typical of me 2 3 = Somewhat typical of me 4 5 = Very typical of me		Not at all typical		Somewhat typical		Very typical
1.	If I do not have enough time to do everything, I do not worry about it.	**1**	**2**	**3**	**4**	**5**
2.	My worries overwhelm me.	**1**	**2**	**3**	**4**	**5**
3.	I do not tend to worry about things.	**1**	**2**	**3**	**4**	**5**
4.	Many situations make me worry.	**1**	**2**	**3**	**4**	**5**
5.	I know I should not worry about things, but I just cannot help it.	**1**	**2**	**3**	**4**	**5**
6.	When I am under pressure I worry a lot.	**1**	**2**	**3**	**4**	**5**
7.	I am always worrying about something.	**1**	**2**	**3**	**4**	**5**
8.	I find it easy to dismiss worrisome thoughts.	**1**	**2**	**3**	**4**	**5**
9.	As soon as I finish one task, I start to worry about everything else I have to do.	**1**	**2**	**3**	**4**	**5**
10.	I never worry about anything.	**1**	**2**	**3**	**4**	**5**
11.	When there is nothing more I can do about a concern, I do not worry about it any more.	**1**	**2**	**3**	**4**	**5**
12.	I have been a worrier all my life.	**1**	**2**	**3**	**4**	**5**

13.	I notice that I have been worrying about things.	**1**	**2**	**3**	**4**	**5**
14.	Once I start worrying, I cannot stop.	**1**	**2**	**3**	**4**	**5**
15.	I worry all the time.	**1**	**2**	**3**	**4**	**5**
16.	I worry about projects until they are all done.	**1**	**2**	**3**	**4**	**5**

Appendix M

Ruminative Response Scale – Brooding Reflection

Lakehead UNIVERSITY

Participant #: _____

RRS-BR

People think and do many different things when they feel sad, blue or depressed. Please read each of the items below and indicate whether you never, sometimes, often, or always think or do each one when you feel sad, down, or depressed. Please indicate what you have generally done during the past few weeks, not what you think you should do.

0 = Never
1 = Sometimes
2 = Often
3 = Always

		Never	Sometimes	Often	Always
1.	Think "What am I doing to deserve this?"	**0**	**1**	**2**	**3**
2.	Analyze recent events to try to understand why you are depressed.	**0**	**1**	**2**	**3**
3.	Think "Why do I always react this way?"	**0**	**1**	**2**	**3**
4.	Go away by yourself and think about why you feel this way.	**0**	**1**	**2**	**3**
5.	Write down what you are thinking and analyze it.	**0**	**1**	**2**	**3**
6.	Think about a recent situation, wishing it had gone better.	**0**	**1**	**2**	**3**
7.	Think "Why do I have problems other people don't have?"	**0**	**1**	**2**	**3**
8.	Think "Why can't I handle things better?"	**0**	**1**	**2**	**3**
9.	Analyze your personality to try to understand why you are depressed.	**0**	**1**	**2**	**3**
10.	Go some place alone to think about your feelings.	**0**	**1**	**2**	**3**

Appendix N

Balanced Inventory of Desirable Responding

Lakehead UNIVERSITY

Participant #: _____

BIDR

Using the scale below as a guide, circle a number beside each statement to indicate how much you agree with it.								
1 = Not true 2 3 4 = Somewhat true 5 6 7 = Very true		Not true			Somewhat true			Very true
1.	My first impressions of people usually turn out to be right.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	It would be hard for me to break any of my bad habits.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	I don't care to know what other people really think of me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	I have not always been honest with myself.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	I always know why I like things.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	When my emotions are aroused, it biases my thinking.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	Once I've made up my mind, other people can seldom change my opinion.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	I am not a safe driver when I exceed the speed limit.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	I am fully in control of my own fate.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	It's hard for me to shut off a disturbing thought.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	I never regret my decisions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	I sometimes lose out on things because I can't make up my mind soon enough.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	The reason I vote is because my vote can make a difference.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

14.	My parents were not always fair when they punished me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	I am a completely rational person.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	I rarely appreciate criticism.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	I am very confident of my judgments.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	I have sometimes doubted my ability as a lover.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	It's all right with me if some people happen to dislike me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	I don't always know the reasons why I do the things I do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	I sometimes tell lies if I have to.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	I never cover up my mistakes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	There have been occasions when I have taken advantage of someone.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	I never swear.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25.	I sometimes try to get even rather than forgive and forget.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	I always obey laws, even if I'm unlikely to get caught.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27.	I have said something bad about a friend behind his or her back.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28.	When I hear people talking privately, I avoid listening.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
29.	I have received too much change from a salesperson without telling him or her.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
30.	I always declare everything at customs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
31.	When I was young I sometimes stole things.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
32.	I have never dropped litter on the street.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
33.	I sometimes drive faster than the speed limit.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
34.	I never read sexy books or magazines.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

35.	I have done things that I don't tell other people about.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
36.	I never take things that don't belong to me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
37.	I have taken sick-leave from work or school even though I wasn't really sick.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
38.	I have never damaged a library book or store merchandise without reporting it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
39.	I have some pretty awful habits.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
40.	I don't gossip about other people's business.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Appendix O

Personality Research Form – Infrequency Scale

Lakehead UNIVERSITY

Participant #: _____

PRF-IN

Read each statement and decide whether or not it describes you. If you agree with a statement or decide that it does describe you, circle 1 for true. If you disagree with a statement or feel that is not descriptive of you, circle 0 for false.		
0 = False 1 = True	False	True
1. I have never bought anything in a store.	**0**	**1**
2. I could easily count from one to twenty-five.	**0**	**1**
3. I can run a mile in less than four minutes.	**0**	**1**
4. I have never talked to anyone by telephone.	**0**	**1**
5. I usually wear something warm when I go outside on a very cold day.	**0**	**1**
6. I make all my own clothes and shoes.	**0**	**1**
7. I have never brushed or cleaned my teeth.	**0**	**1**
8. Things with sugar in them usually taste sweet to me.	**0**	**1**
9. Sometimes I see cars near my home.	**0**	**1**
10. I have never had any hair on my head.	**0**	**1**
11. I have traveled away from my home town.	**0**	**1**
12. I have never ridden in an automobile.	**0**	**1**
13. I have never felt sad.	**0**	**1**
14. I try to get at least some sleep every night.	**0**	**1**

15.	Sometimes I feel thirsty or hungry.	**0**	**1**
16.	I have attended school at some time during my life.	**0**	**1**

Appendix P

Lakehead University's Research Ethics Letter of Approval

Lakehead
UNIVERSITY

Office of Research Services

January 16, 2013

Tel 807-343-8934
Fax 807-346-7749

Principal Investigator: Dr. Dwight Mazmanian
Student Investigator: Megan Short
Department of Psychology
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Dr. Mazmanian and Ms Short:

Re: REB Project #: 097 12-13 / Romeo File No: 1463042
Granting Agency: N/A
Granting Agency Project #: N/A

On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project titled, "Mindfulness, Happiness, and Achievement in Students".

Ethics approval is valid until January 16, 2014. Please submit a Request for Renewal form to the Office of Research Services by December 16, 2013 if your research involving human subjects will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Research Ethics Board forms are available at:

http://research.lakeheadu.ca/ethics_resources.html

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Completed reports and correspondence may be directed to:

Research Ethics Board
c/o Office of Research Services
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1
Fax: (807) 346-7749

Best wishes for a successful research project.

Sincerely,

Dr. Richard Maundrell
Chair, Research Ethics Board

/scw

Lakehead Research...CREATING THE FUTURE NOW

955 Oliver Road Thunder Bay Ontario Canada P7B 5E1 www.lakeheadu.ca

Appendix Q

Study 1 Initial Contact Script

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Initial Contact Script

My name is Megan Short and I am a graduate student in the Clinical Psychology Progrom at Lakehead University. I am currently working on a research project under the supervision of Dr. Dwight Mazmanian of the psychology department. We are conducting a study investigating how personality relates to well-being and academic-related outcomes. This study involves two phases. During each phase you will be asked to complete a demographic form and then a series of short online questionnaires and self-report questions. Each phase should take approximately 60 minutes to complete. Phase 1 will occur at the beginning of the semester (i.e., first month) and Phase 2 will occur at the end of the semester (i.e., last month before final exams). After completing Phase 1, you will be sent an email reminder one week before Phase 2 is required.

If you are interested in being a participant in this study, please feel free to access the website on the bottom of the information letter that is currently being handed out. Your participation in this study is entirely voluntary, and you will receive no penalty for non-participation. You can receive one bonus mark for completing each phase, for a total of two bonus marks for completing the full study, provided that you email the researcher (mshort@lakeheadu.ca) with your name, student number, instructor's name, and class time. Please be assured that the responses you provide will be in no way linked to your name or contact information. Your name and email will not be linked to your completed questionnaires in any way. If you have any questions about the study, please feel free to ask them now. Thank you very much for your time.

Appendix R

Study 1 and Study 2 Contact Information Form

Participant #: _____

Lakehead UNIVERSITY

Contact Information

We would like to contact you to remind you when you are requested to complete your next online questionnaires. Your contact information will be removed from your questionnaire responses to maintain that your data is anonymous.

1. **Your first name, middle name, and last name:**

   _____

2. **Your email address:**

   _____

Appendix S

Study 1 Information Letter

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Information Letter

Research title: Happiness and Achievement in Students

Research personnel: For questions about this study please contact the student researcher, Megan Short (Department of Psychology, Lakehead University, **mshort@lakeheadu.ca**) or the Supervisor, Dr. Dwight Mazmanian (Department of Psychology, Lakehead University, **dmazmani@lakeheadu.ca**). Lakehead University's Research Ethics Board has approved the proposal for this research. If you have any ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Research Ethics Board by telephone at **1-807-343-8283**.

Purpose: The purpose of this study is to provide insight into how certain characteristics of personality may affect well-being (e.g., happiness) and academic-related outcomes (e.g., academic achievement).

Task requirements: This study involves two phases. During each phase you will be asked to complete a demographic form and then a series of short online questionnaires and self-report questions. Each phase should take approximately 60 minutes to complete. Phase 1 will occur at the beginning of the semester (i.e., end of September) and Phase 2 will occur at the end of the semester (i.e., end of November). After completing Phase 1, you will be sent an email reminder one week before Phase 2 is required.

Potential risks: You will be placed at no more risk than a person would experience in a normal day. There are no known physical or psychological risks associated with completing the questionnaires in this study. You are under no obligation to continue the study if you experience internal discomfort during any part of it. We understand that completing a psychological study may raise some personal issues.
In the event that this does occur, we ask that you contact the Student Health and Counselling Centre at Lakehead University (UC1007), telephone **1-807-343-8361**, or the Thunder Bay Crisis Response Service, telephone **1-807-346-8282**, where a counsellor will be available to speak with you immediately.

Benefits: Your participation in this study will contribute toward research on personality and how it relates to positive and negative outcomes. **You can receive one bonus mark for completing each phase, for a total of two bonus marks for completing the full study, provided that you email the researcher (mshort@lakeheadu.ca) with your name, student number, instructor's name, and class time.**. A summary of the research findings can also be made available to you by e-mailing the researcher.

Anonymity and confidentiality: Anonymity will be maintained throughout the study. Your name will not be published in any reports stemming from this research. You will be asked to provide your name and email address in order to be contacted to complete Phase 2; however, contact information will be destroyed after completion of Phase 2. All data will be coded with a number, and no identifying information will be associated with responses or study results in order to maintain confidentiality and anonymity. All forms and data will be stored on a secure computer at Lakehead University for five years for publication purposes. Only persons directly involved with the research will have access to the data, and they will be required to uphold confidentiality.

Right to withdraw: Your participation is completely voluntary, you may refuse to complete any part or question, and you may withdraw from this study at any point without any explanation or penalty.

To participate: The data in this study will be used in research publications or for teaching purposes. Please go to the website below to participate in this study. You must be 18 years of age or older.

https://www.surveymonkey.com/s/happiness _and_achievement

Appendix T

Study 1 Informed Consent Form

Lakehead UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Informed Consent Form

Research title: Happiness and Achievement in Students

Research personnel: For questions about this study please contact the student researcher, Megan Short (Department of Psychology, Lakehead University, **mshort@lakeheadu.ca**) or the Supervisor, Dr. Dwight Mazmanian (Department of Psychology, Lakehead University, **dmazmani@lakeheadu.ca**). Lakehead University's Research Ethics Board has approved the proposal for this research. If you have any ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Research Ethics Board by telephone at **1-807-343-8283**.

Purpose: The purpose of this study is to provide insight into how certain characteristics of personality may affect well-being (e.g., happiness) and academic-related outcomes (e.g., academic achievement).

Task requirements: This study involves two phases. During each phase you will be asked to complete a demographic form and then a series of short online questionnaires and self-report questions. Each phase should take approximately 60 minutes to complete. Phase 1 will occur at the beginning of the semester (i.e., end of September) and Phase 2 will occur at the end of the semester (i.e., end of November). After completing Phase 1, you will be sent an email reminder one week before Phase 2 is required.

Potential risks: You will be placed at no more risk than a person would experience in a normal day. There are no known physical or psychological risks associated with completing the questionnaires in this study. You are under no obligation to continue the study if you experience internal discomfort during any part of it. We understand that completing a psychological study may raise some personal issues. In the event that this does occur, we ask that you contact the Student Health and Counselling Centre at Lakehead University (UC1007), telephone **1-807-343-8361**, or the Thunder Bay Crisis Response Service, telephone **1-807-346-8282**, where a counsellor will be available to speak with you immediately.

Benefits: Your participation in this study will be contributing toward research on personality and how it relates to positive and negative outcomes. **You can receive one bonus mark for completing each phase, for a total of two bonus marks for completing the full study, provided that you email the researcher (mshort@lakeheadu.ca) with your name, student number, instructor's name, and class time**. A summary of the research findings can also be made available to you by e-mailing the researcher.

Anonymity and confidentiality: Anonymity will be maintained throughout the study. Your name will not be published in any reports stemming from this research. You will be asked to provide your name and email address in order to be contacted to complete Phase 2; however, contact information will be destroyed after completion of Phase 2. All data will be coded with a number, and no identifying information will be associated with responses or study results in order to maintain confidentiality and anonymity. All forms and data will be stored on a secure computer at Lakehead University for five years for publication purposes. Only persons directly involved with the research will have access to the data, and they will be required to uphold confidentiality.

Right to withdraw: Your participation is completely voluntary, you may refuse to complete any part or question, and you may withdraw from this study at any point without any explanation or penalty.

Consent: I have read the above description and I understand that the data in this study will be used in research publications or for teaching purposes. By selecting "Agree", I am indicating that that I agree to participate in this study, and that I am 18 years of age or older.

☐ **Agree**

Appendix U

Study 1 Debriefing Forms

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Debriefing Form

Research title: Happiness and Achievement in Students (Phase 1)

You have just completed questionnaires that examined variables related to happiness and achievement in students. All data will remain anonymous and your name will not be published in any reports stemming from this research. Remember that if you are in Introductory Psychology, you can receive one bonus mark for completing this phase of the study, provided that you email the researcher (**mshort@lakeheadu.ca**) with your student number, instructor's name, and class time. Please be assured that the responses you provided will be in no way linked to your name or contact information. To obtain a summary of the results of the study, please e-mail the student researcher (**mshort@lakeheadu.ca)** and an electronic summary of the results will be sent to you at the completion of the study.

In a few months you will be contacted via email to complete Phase 2 of this study, which will consist of a similar online questionnaire battery. The researcher will send you an email reminder about Phase 2 one week before it is required for you to complete it. If you are in introductory Psychology, you will receive an additional one bonus mark for completing Phase 2 of this study.

Occasionally, completing a psychological study may raise some internal issues. Any discomfort should naturally decrease as it would anytime you normally worry. However, if you notice any persisting internal discomfort, please contact the Student Health and Counselling Centre at UC1007, telephone **1-807-343-8261**. If you should have a personal emergency, please call the Thunder Bay Crisis Response Service, telephone **1-807-346-8282,** where a counsellor will be available to speak with you immediately.

If at any time you have any further questions or concerns regarding this research, feel free to contact the student researcher, Megan Short, at **mshort@lakeheadu.ca.**

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Debriefing Form

Research title: MIndfulness in Students (Phase 2)

You have just participated in a study that examined whether mindfulness skills training can minimize negative outcomes (e.g., depressed mood) and enhance positive outcomes (e.g., academic achievement) related to having a perfectionistic personality. Perfectionism is a stable personality characteristic where an individual has a tendency to compulsively strive towards perfection and high standards. Mindfulness skills are the ability to direct one's attention to the present-moment, so that one is aware of current stimuli in an accepting and non-judgmental way. Mindfulness skills may have a useful role in reducing the negative outcomes of perfectionism, possibly by learning to accept negative thoughts in a non-judgmental way. It is also possible that mindfulness skills may enhance positive outcomes related to perfectionism. For example, training in present-moment awareness may help students increase their self-regulation skills, which could further increase academic achievement. Students were randomly assigned to the experimental group (i.e., mindfulness training) or a control group (i.e., no mindfulness training).

All data will remain anonymous and your name will not be published in any reports stemming from this research. Please be assured that the responses you provided will be in no way linked to your name or contact information. To obtain a summary of the results of the study, please e-mail the student researcher (**mshort@lakeheadu.ca)** and an electronic summary of the results will be sent to you at the completion of the study. Occasionally, completing a psychological study may raise some internal issues. Any discomfort should naturally decrease as it would anytime you normally worry. However, if you notice any persisting internal discomfort, please contact the Student Health and Counselling Centre at UC1007, telephone **1-807-343-8261**. If you should have a personal emergency, please call the Thunder Bay Crisis Response Service, telephone **1-807-346-8282,** where a counsellor will be available to speak with you immediately.

If at any time you have any further questions or concerns regarding this research, feel free to contact the student researcher, Megan Short, at **mshort@lakeheadu.ca.** If you are interested in research in this area, below are excellent references for additional information:

Hewitt, P. L., & Flett, G. L. (1991). Dimensions of perfectionism in unipolar depression. *Journal of Abnormal Psychology, 100*, 98-101. doi:10.1037/0021-843X.100.1.98

Gaudreau, P., & Thompson, A. (2010). Testing a 2 x 2 model of dispositional perfectionism. *Personality and Individual Differences, 48,* 532-537. doi:10.1016/j.paid.2009.11.031

Caldwell, K., Harrison, M., Adams, M, Quin, R. H., & Greeson, J. (2010). Developing mindfulness in college students through movement-based courses: Effects on self-regulatory self-efficacy, mood, stress, and sleep quality. *Journal of American College Heath, 58*(5), 433-442. doi:10.1080/07448480903540481

Appendix V

Study 2 Initial Contact Script

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Initial Contact Script

My name is Megan Short and I am a graduate student in the Clinical Psychology Program. I am currently working on a research project under the supervision of Dr. Dwight Mazmanian of the psychology department. We are conducting a study investigating whether mindfulness skill training can minimize negative outcomes and enhance positive outcomes in students. Mindfulness skills are the ability to direct one's attention to the present-moment, so that one is aware of current stimuli in an accepting and non-judgmental way.

This study involves an expiermental group (i.e., mindfulness training) and a control group (i.e., no mindfulness trainging). You will be randomly assigned to either group using a random number generator. Participants in the experimental group (i.e., mindfulness group) will take part in mindfulness skills training over four weeks.The mindfulness skills training will involve 1.5 hour training sessions once a week, with mindfulness skills practice between each session. Participants in the control group will not take part in this mindfulness training. Participants in both the experimental group and the control group will be asked to complete a series of short questionnaires over two phases (i.e., at the beginning and end of the study period). Each questionnaire battery should take approximately 60 minutes to complete. If interested, participants in the control group (i.e., no mindfulness training) will be offered mindfulness skills training resources at the end of the study. For this study, we are looking for participants who have not received any prior mindfulness training, are not currently receiving psychotherapy or using psychopharmacology.

If you are interested in being a participant in this study, and met those criteria, please fill out the contact information form that is currently being handed out. Your participation in this study is entirely voluntary, and you will receive no penalty for non-participation. If you are in Introductory Psychology you can receive one bonus mark for completing each phase, for a total of two bonus marks for completing the full study. Please be assured that the responses you provide will be in no way linked to your name or contact information. Your name and email will not be linked to your completed questionnaires in any way. If you have any questions about the study, please feel free to ask them now. Thank you very much for your time.

Appendix W

Training Adherence Scale

Mindfulness for Students: Training Adherence Items

		NO EVIDENCE	SOME EVIDENCE	FULL EVIDENCE
1.	**HOME PRACTICE REVIEW:** The facilitators reviewed home practice that was assigned during the previous class (or indicated in Class 1 that home practice would be assigned after each class).	**0**	**1**	**2**
2.	**FORMAL MINDFULNESS PRACTICES:** The facilitators guided participants through a formal mindfulness practice.	**0**	**1**	**2**
3.	**PRACTICE REVIEW/INQUIRY:** The facilitators used inquiry to review the mindfulness practices.	**0**	**1**	**2**
4.	**SENSATIONS, THOUGHTS, AND EMOTIONS LINKAGES:** The facilitators highlighted the links between body sensations, thoughts, and emotions.	**0**	**1**	**2**
5.	**LANGUAGE ENCOURAGING ACCEPTANCE VERSUS AVERSION:** The facilitators used language that related participants' experiences to a standpoint of acceptance as opposed to aversion.	**0**	**1**	**2**
6.	**PROVISION OF MINDFULNESS RATIONALE:** The facilitators encouraged discussion on why performance of mindfulness practices might be useful for students.	**0**	**1**	**2**
7.	**CONVEYS CORE THEMES:** The facilitators discussed core themes through the class summary.	**0**	**1**	**2**
8.	**HOME PRACTICE SETTING:** The facilitators assigned and encouraged daily home practice to participants.	**0**	**1**	**2**

Appendix X

Study 2 Information Letter

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Information Letter

Research title: Mindfulness in Students

Research personnel: For questions about this study please contact the student researcher, Megan Short (Department of Psychology, Lakehead University, **mshort@lakeheadu.ca**) or the Supervisor, Dr. Dwight Mazmanian (Department of Psychology, Lakehead University, **dmazmani@lakeheadu.ca**). Lakehead University's Research Ethics Board has approved the proposal for this research. If you have any ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Research Ethics Board by telephone at **1-807-343-8283**.

Purpose: The purpose of this study is to examine whether mindfulness skill training can minimize negative outcomes (e.g., negative mood) and enhance positive outcomes (e.g., academic achievement) in students.

Task requirements: This study involves an expiermental group (i.e., mindfulness training) and a control group (i.e., no mindfulness trainging). You will be randomly assigned to either group using a random number generator. Participants in the experimental group (i.e., mindfulness group) will be take part in mindfulness skills training over four weeks.This training will involve 1.5 hour training sessions once a week, with mindfulness skills practice between each session. Participants in both the experimental group and the control group will be asked to complete a series of short online questionnaires over two phases (i.e., at the beginning and end of the study period). Each questionnaire battery should take approximately 60 minutes to complete. If interested, participants in the control group (i.e., no mindfulness training) will be offered mindfulness skills training resources at the end of the study.

Potential risks: You will be placed at no more risk than a person would experience in a normal day. There are no known physical or psychological risks associated with completing the questionnaires in this study or in participating in mindfulness training. You are under no obligation to continue the study if you experience internal discomfort during any part of it. We understand that completing a psychological study may raise some personal issues. In the event that this does occur, we ask that you contact the Student Health and Counselling Centre at Lakehead University (UC1007), telephone **1-807-343-8361**, or the Thunder Bay Crisis Response Service, telephone **1-807-346-8282**, where a counsellor will be available to speak with you immediately.

Benefits: Your participation in this study will be contributing toward research on mindfulness and how it relates to positive and negative outcomes. **You can receive one bonus mark for completing each phase, for a total of two bonus marks for completing the full study, provided that you email the researcher (mshort@lakeheadu.ca) with your name, student number, instructor's name, and class time**. A summary of the research findings can also be made available to you by e-mailing the researcher.

Anonymity and confidentiality: Anonymity will be maintained throughout the study. Your name will not be published in any reports stemming from this research. You will be asked to provide your name and email address in order to be contacted to complete Phase 2; however, contact information will be destroyed after completion of Phase 2. All data will be coded with a number, and no identifying information will be associated with responses or study results in order to maintain confidentiality and anonymity. All forms and data will be stored on a secure computer at Lakehead University for five years for publication purposes. Only persons directly involved with the research will have access to the data, and they will be required to uphold confidentiality.

Right to withdraw: Your participation is completely voluntary, you may refuse to complete any part or question, and you may withdraw from this study at any point without any explanation or penalty.

To participate: The data in this study will be used in research publications or for teaching purposes. Please provide your contact information if you wish to participate, or email the researcher **(mshort@lakeheadu.ca)**. You must be 18 years of age or older and have never received any mindfulness training.

Appendix Y

Study 2 Informed Consent Form

Lakehead UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Informed Consent Form

Research title: Mindfulness in Students

Research personnel: For questions about this study please contact the student researcher, Megan Short (Department of Psychology, Lakehead University, **mshort@lakeheadu.ca**) or the Supervisor, Dr. Dwight Mazmanian (Department of Psychology, Lakehead University, **dmazmani@lakeheadu.ca**). Lakehead University's Research Ethics Board has approved the proposal for this research. If you have any ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Research Ethics Board by telephone at **1-807-343-8283**.

Purpose: The purpose of this study is to examine whether mindfulness skill training can minimize negative outcomes (e.g., negative mood) and enhance positive outcomes (e.g., academic achievement) in students.

Task requirements: This study involves an expiermental group (i.e., mindfulness training) and a control group (i.e., no mindfulness trainging). You will be randomly assigned to either group. Participants in the experimental group (i.e., mindfulness group) will be take part in mindfulness skills training over four weeks.This training will involve 1.5 hour training sessions once a week, with mindfulness skills practice between each session. Participants in both the experimental group and the control group will be asked to complete a series of short online questionnaires over two phases (i.e., at the beginning and end of the study period). Each questionnaire battery should take approximately 60 minutes to complete. If interested, participants in the control group (i.e., no mindfulness training) will be offered mindfulness skills training resources at the end of the study.

Potential risks: You will be placed at no more risk than a person would experience in a normal day. There are no known physical or psychological risks associated with completing the questionnaires in this study or in participating in mindfulness training. You are under no obligation to continue the study if you experience internal discomfort during any part of it. We understand that completing a psychological study may raise some personal issues. In the event that this does occur, we ask that you contact the Student Health and Counselling Centre at Lakehead University (UC1007), telephone **1-807-343-8361**, or the Thunder Bay Crisis Response Service, telephone **1-807-346-8282**, where a counsellor will be available to speak with you immediately.

Benefits: Your participation in this study will be contributing toward research on mindfulness and how it relates to positive and negative outcomes. **You can receive one bonus mark for completing each phase, for a total of two bonus marks for completing the full study, provided that you email the researcher (mshort@lakeheadu.ca) with your name, student number, instructor's name, and class time**. A summary of the research findings can also be made available to you by e-mailing the researcher.

Anonymity and confidentiality: Anonymity will be maintained throughout the study. Your name will not be published in any reports stemming from this research. You will be asked to provide your name and email address in order to be contacted to complete Phase 2; however, contact information will be destroyed after completion of Phase 2. All data will be coded with a number, and no identifying information will be associated with responses or study results in order to maintain confidentiality and anonymity. All forms and data will be stored on a secure computer at Lakehead University for five years for publication purposes. Only persons directly involved with the research will have access to the data, and they will be required to uphold confidentiality.

Right to withdraw: Your participation is completely voluntary, you may refuse to complete any part or question, and you may withdraw from this study at any point without any explanation or penalty.

To participate: The data in this study will be used in research publications or for teaching purposes. Please provide your contact information if you wish to participate, or email the researcher **(mshort@lakeheadu.ca)**. You must be 18 years of age or older and have never received any mindfulness training.

☐ **Agree**

Appendix Z

Study 2 Debriefing Forms

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

Phone: (807) 343-8943
Fax: (807) 343-7734
mshort@lakeheadu.ca

Debriefing Form

Research title: Mindfulness in Students (Phase 1)

You have just completed questionnaires that examined variables related to mindfulness in students. All data will remain anonymous and your name will not be published in any reports stemming from this research Please be assured that the responses you provided will be in no way linked to your name or contact information.

In a few weeks you will be contacted via email to complete the next phase of this study, which will consist of a similar online questionnaire battery. The researcher will send you an email reminder about the next phase one week before it is required for you to complete it.

Occasionally, completing a psychological study may raise some internal issues. Any discomfort should naturally decrease as it would anytime you normally worry. However, if you notice any persisting internal discomfort, please contact the Student Health and Counselling Centre at UC1007, telephone **1-807-343-8261**. If you should have a personal emergency, please call the Thunder Bay Crisis Response Service, telephone **1-807-346-8282,** where a counsellor will be available to speak with you immediately.

If at any time you have any further questions or concerns regarding this research, feel free to contact the student researcher, Megan Short, at **mshort@lakeheadu.ca.**

Lakehead
UNIVERSITY

Health, Hormones, and Behaviour Lab

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Debriefing Form

Research title: MIndfulness in Students (Phase 2)

You have just participated in a study that examined whether mindfulness skill training can minimize negative outcomes (e.g., depressed mood) and enhance positive outcomes (e.g., academic achievement) related to having a perfectionistic personality. Perfectionism is a stable personality characteristic where an individual has a tendency to compulsively strive towards perfection and high standards. Mindfulness skills are the ability to direct one's attention to the present-moment, so that one is aware of current stimuli in an accepting and non-judgmental way. Students were randomly assigned to the experimental group (i.e., mindfulness training) or a control group (i.e., no mindfulness training).

All data will remain anonymous and your name will not be published in any reports stemming from this research. Please be assured that the responses you provided will be in no way linked to your name or contact information. To obtain a summary of the results of the study, please e-mail the student researcher (**mshort@lakeheadu.ca)** and an electronic summary of the results will be sent to you at the completion of the study.

Occasionally, completing a psychological study may raise some internal issues. Any discomfort should naturally decrease as it would anytime you normally worry. However, if you notice any persisting internal discomfort, please contact the Student Health and Counselling Centre at UC1007, telephone **1-807-343-8261**. If you should have a personal emergency, please call the Thunder Bay Crisis Response Service, telephone **1-807-346-8282,** where a counsellor will be available to speak with you immediately.

If at any time you have any further questions or concerns regarding this research, feel free to contact the student researcher, Megan Short, at **mshort@lakeheadu.ca.**

If you are interested in research in this area, below are excellent references for additional information:

Hewitt, P. L., & Flett, G. L. (1991). Dimensions of perfectionism in unipolar depression. *Journal of Abnormal Psychology, 100*, 98-101. doi:10.1037/0021-843X.100.1.98

Gaudreau, P., & Thompson, A. (2010). Testing a 2 x 2 model of dispositional perfectionism. *Personality and Individual Differences, 48,* 532-537. doi:10.1016/j.paid.2009.11.031

Caldwell, K., Harrison, M., Adams, M, Quin, R. H., & Greeson, J. (2010). Developing mindfulness in college students through movement-based courses: Effects on self-regulatory self-efficacy, mood, stress, and sleep quality. *Journal of American College Heath, 58*(5), 433-442. doi:10.1080/07448480903540481

Appendix AA

Mindfulness Practice Log

Lakehead UNIVERSITY

Participant #: _____

Mindfulness Practice Log

Week Target:						
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
❑ **Day Off**	❑ **Day Off**	❑ **Day Off**	❑ **Day Off**	❑ **Day Off**	❑ **Day Off**	❑ **Day Off**
Getting to It: *What strategies (time of day, place, timers, etc.) made it easiest to practice this week?*						
Quality of Practice: *What strategies helped you to improve the quality of your practice?*						
Changes in Daily Life: *Did you notice any benefits in your daily life (patience, calmer, etc) from your practice this week?*						
Plans for Next Week: *What is one thing you can do next week to improve practice and/or maximize benefits?*						