DIMENSIONS OF PERFECTIONISM AND LIFE STRESS: PREDICTING SYMPTOMS OF PSYCHOPATHOLOGY

by

Lisa Lee

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Abstract

Research has consistently shown an association between the personality trait of perfectionism and a variety of emotional, psychological, and interpersonal difficulties. Using a longitudinal design, the present investigation aimed to examine the validity of a diathesis-stress model linking perfectionism to specific psychopathological symptoms in a large sample of university students. The specific stress processes of stress enhancement and stress generation were examined as potential mechanisms linking perfectionism with emotional maladjustment (see Hewitt & Flett, 2002). In addition, two different frameworks for conceptualizing perfectionism were tested: (1) a multidimensional framework by Hewitt and Flett (1991) which posits that perfectionistic tendencies and behaviours are influenced both by intrapersonal and interpersonal factors, and (2) a adaptive-maladaptive perfectionism typology (Frost et al., 1993) which posits the existence of both a positive and a negative form of perfectionism.

Results of this investigation indicated that particular dimensions of perfectionism were directly predictive of stress enhancement. In addition, particular dimensions of perfectionism were also predictive of stress generation, albeit indirectly via the experience of general negative affect. Finally, perfectionism was indeed predictive of increases in emotional maladjustment over time. More specifically, particular perfectionism dimensions were directly predictive of psychopathological symptoms, while other dimensions were only predictive of symptoms via their interactions with relevant measures of life stress (i.e., via a diathesis-stress interaction).

The results of the present investigation do not support the adaptive-maladaptive perfectionism typology in that the measure of adaptive perfectionism used was predictive

of both stress and psychopathological symptoms. The results of this study are more consistent with the perfectionism framework highlighting intrapersonal-interpersonal dimensions. Overall, the results of this study suggest that a diathesis-stress model provides a fruitful framework from which to investigate perfectionism and its relation to psychopathology.

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Chapter 1
Theoretical Context

Perfectionism is a personality style that is commonly characterized by striving for flawlessness, the setting of excessively high standards for performance, and tendencies toward self-criticalness. Research has shown that excessive perfectionism is linked to poor psychological adjustment in the form of depression, anxiety disorders, eating disorders, increased risk for suicide, as well as somatic/health problems and interpersonal problems (for a review see Shafran & Mansell, 2001). Although the connection between perfectionism and a variety of negative outcomes has been well established, less research has focused on the mechanisms or processes by which this personality style comes to be associated with such a wide range of psychological, emotional, cognitive, behavioural, and interpersonal problems. The main goal of this study was to examine one such mechanism – a diathesis-stress model linking perfectionism to symptoms of psychopathology.

More specifically, the current investigation was aimed at elucidating how trait perfectionism influences and interacts with the experience of stressful life events to predict symptoms of depression and anxiety. This study tested a diathesis-stress model, emphasizing the processes of *stress enhancement* and *stress generation* as specific mechanisms linking perfectionism with psychopathology. The remainder of this chapter will: (a) review conceptual and assessment issues pertaining to the study of perfectionism, (b) review research linking perfectionism with a variety of psychopathological syndromes and symptoms, and (c) discuss a diathesis-stress

framework for understanding how perfectionism can come to be associated with psychopathological symptoms. This discussion will support, motivate, and provide context for the current investigation. The chapter will conclude with a summary of the objectives of the current investigation.

The Conceptualization and Assessment of Perfectionism

Over the last 20 years, psychological researchers have become very interested in studying the construct of perfectionism. Numerous empirical investigations have been published examining the nature, correlates, and consequences of this personality style. Much of this research has emphasized the pernicious effects of perfectionism and highlighted deleterious consequences that befall the perfectionist, including chronic feelings of failure and dissatisfaction, bouts of depression and anxiety, interpersonal problems, and even suicide (Blatt, 1995; Burns, 1980). By contrast, the lay perception of perfectionism is quite different. Often perfectionism is equated with excellence. Competitive athletes strive towards achieving that perfect score. Musicians push themselves to perform flawlessly. Successful individuals in business, science, and the creative arts, are often described as perfectionists – meticulous, motivated, driven, always raising the bar. In our North American society, with its emphasis on success and achievement, perfectionism is not only condoned, it is encouraged and often revered.

The discrepancy in how perfectionism is conceptualized by the layperson and the researcher highlights the important issue of definition. What is perfectionism? What are the defining characteristics of this personality orientation? Unfortunately, these questions cannot be simply answered. Different research groups have developed different

frameworks for delineating and understanding perfectionism and although increased research attention has led to a better understanding of the construct, we are now faced with a variety of different conceptualizations. For example, Flett and Hewitt (2002) list more than 20 different definitions of perfectionism that have surfaced in the literature. Generally, perfectionists are described as people who set very high standards for their own performance and continuously strive to meet these standards. Often a perfectionist's sense of self-worth is contingent upon achieving these standards. Perfectionists are very self-critical and at the extreme, they demand perfection in all aspects of their lives. However, depending on the particular approach or framework for studying perfectionism, different aspects of perfectionistic personality are included/excluded or emphasized/deemphasized. For example, perfectionism can be seen as unidimensional or multidimensional in nature, adaptive or maladaptive, or generalized or specific to particular domains. In the early 1990s, two multidimensional approaches to studying perfectionism were independently developed by Frost and colleagues and Hewitt, Flett, and colleagues. These two models, which have since been widely adopted and researched, are discussed below.

Multidimensional Approaches

In their conceptualization of perfectionism, Frost and colleagues (1990) took a multidimensional approach to studying perfectionism. They noted that previous work had used definitions of perfectionism that were unidimensional, non-specific and/or varied. They aimed to more precisely define perfectionism by reviewing the existing literature and selecting features of perfectionism that had been identified as significant to

the construct. Based on their research, Frost et al. (1990) developed a 35-item self-report questionnaire, the Multidimensional Perfectionism Scale (MPS-Frost) that assessed six related dimensions of perfectionism: (1) *Concern Over Mistakes (CM)*: an excessive concern over mistakes in performance; (2) *Organization (O)*: an exaggerated emphasis on precision, order, and organization; (3) *Parental Criticism (PC)*: the extent to which parents are perceived as being overly critical; (4) *Parental Expectations (PE)*: the extent to which parents are perceived as having high expectations; (5) *Personal Standards (PS)*: having excessively high personal standards; and (6) *Doubts About Actions (DA)*: a tendency to doubt the quality of one's performance. Thus, this multidimensional approach delineated the defining features of perfectionism, as well as emphasizing potential developmental factors (i.e., the role of parental influence).

In their initial study of the MPS-Frost with a sample of university students, Frost and colleagues (1990) reported internal consistencies (α) for the subscales ranging from .77 to .93. Correlations between dimensions of the MPS-Frost and various measure of psychopathology and personality were examined. Perfectionism, particularly the CM and DA dimensions, was broadly related to a variety of symptomatology (e.g., depression, anxiety, hostility) as assessed by the Brief Symptom Inventory (Derogatis & Melisaratos, 1983). Consistent with predictions, perfectionism showed a stronger association with self-criticalness than dependency, as assessed by the Depressive Experiences Questionnaire (Blatt, D'Afflitti, & Quinlan, 1976). Since this first report on the MPS-Frost, several other studies have assessed the psychometric properties of the scale (e.g.,

Parker & Adkins, 1995; Parker & Stumpf, 1995) and the results provide confirmation of the original suggested factor structure.

An alternative multidimensional framework of perfectionism was developed by Hewitt and Flett (1991a), who noted that past conceptualizations of perfectionism were unidimensional and focused entirely on self-directed cognitions or beliefs. They posited that perfectionistic tendencies and behaviours were influenced by both *personal* and *interpersonal* factors. Their framework consists of three dimensions that differ in the source and target of perfectionistic motivations and behaviours: (1) *Self-oriented Perfectionism (SOP)* – characterized by self-directed perfectionistic motivation and behaviours; (2) *Socially-prescribed Perfectionism (SPP)* – characterized by the perception that significant others hold excessively high standards for oneself; and (3) *Other-oriented Perfectionism (OOP)* – characterized by holding excessively high standards for significant others. Hewitt and Flett (1991a) developed a 45-item self-report scale, also called the Multidimensional Perfectionism Scale (MPS-HF), to assess their three proposed dimensions of perfectionism. In their initial report, Hewitt and Flett (1991a) reported internal consistencies (α) for the 3 subscales ranging from .82 to .87. Three-month test-retest reliabilities ranged from .75 to .88.

Hewitt and Flett also included several additional studies of the validity of the MPS-HF in their initial report. Principal-components analyses on large groups of students and psychiatric patients resulted in three-factor solutions closely corresponding to the original item assignments. In addition, subscales of the MPS-HF were compared to a variety of measures tapping personality and performance standards (Hewitt & Flett,

1991a). SOP was most highly related to self-related constructs such as self-criticism, self-blame, and high personal standards and was not related to demand for approval of others, fear of negative evaluation, authoritarianism, dominance, or other-directed blame. OOP was most correlated with other-directed blame, authoritarianism, and dominance, but not correlated with demand for approval of others and fear of negative evaluation. Finally, SPP was most correlated with measures of demand for approval of others, fear of negative evaluation, and locus of control. Although SPP was also significantly correlated with some self-related measures such as self-criticism and self-blame, it was not correlated with authoritarianism or dominance. These results support the discriminant validity of the three MPS-HF subscales. Since Hewitt and Flett (1991a) published their initial studies on the MPS-HF, there have been numerous studies demonstrating that it is a reliable and valid measure of perfectionism (for a review see Enns & Cox, 2002).

Adaptive and Maladaptive Perfectionism

More recently, researchers have focused on exploring and distinguishing between a potential adaptive, or positive, dimension of perfectionism from a more maladaptive, or negative, dimension. This move towards focusing on the potential positive aspects of perfectionism parallels the recent growth of research in the area of positive psychology, and this distinction may help to explain why the layperson view of perfectionism continues to be associated with positive characteristics. In fact, this distinction is not new. Early writing by Hamechek (1978) argued that some aspects of perfectionistic personality were adaptive. He distinguished between "normal" and "neurotic" perfectionism. Neurotic perfectionism was conceptualized as problematic and unhealthy,

with the perfectionist slavishly adhering to their high standards despite setbacks, resulting in a chronic sense of failure, dissatisfaction, and negative affect. In contrast, normal perfectionism was seen as positive because it fostered high standard setting and positive striving for excellence. Normal perfectionists were seen to be able to modify their standards based on feedback, and derive pure satisfaction and pleasure from their accomplishments.

More recently, Slade and Owens (1998) proposed and outlined a Dual Process Model of perfectionism, positing two types of perfectionism based on the principles of reinforcement theory. Their model mirrors Hamechek's earlier distinction with two types of perfectionism – positive and negative. According to the model, individuals high in negative perfectionism are seen to be driven by negative reinforcement and a fear of failure (i.e., an avoidance orientation), while individuals high in positive perfectionism are seen to be motivated by positive reinforcement and a desire for success (i.e., an approach orientation). Similar to Hamachek's earlier conceptualization, negative perfectionists are seen to rigidly adhere to unrealistically high goals despite setbacks and failures, while positive perfectionists are seen to be more flexible in their goal-setting and are able to learn from experience and feedback. In addition to describing the motivation and characteristic behaviours of these two types of perfectionism, Slade and Owens expand on the model by also describing associated goals, self-concept involvement, emotional correlates, and developmental histories of both types of perfectionism. More specifically, positive perfectionists are hypothesized to: actively strive for success, excellence, and approval; pursue their "ideal" sense of self; emotionally experience

satisfaction, pleasure, and euphoria; and have experienced a developmental history of positive/negative modeling from their caregivers. By contrast, negative perfectionists are hypothesized to: actively avoid failure, disapproval, and mediocrity; avoid their "feared" sense of self; emotionally experience dissatisfaction, displeasure, and dypshoria; and have experienced a developmental history of no/conditional reinforcement from their caregivers.

To date, research has begun to emerge that suggests that perfectionism may indeed have both maladaptive and adaptive features. For example, several psychometric investigations examining the factor structure of both MPS measures described above have supported the validity of two-factor solutions, consisting of a negative, or more maladaptive, form of perfectionism and a more positive, or adaptive, form of perfectionism (Frost et al., 1993; Bieling et al., 2004). Frost and colleagues (1993) noted the considerable and consistent overlap of the Frost dimensions and Hewitt and Flett dimensions of perfectionism. They hypothesized that the 9 subscales from the two MPS measures of perfectionism could be reduced to a smaller number of factors. Factor analysis revealed a model with two conceptually distinct factors. Factor 1, labelled *maladaptive evaluative concerns*, consisted of high loadings for the CM, PC, PE, and DA scales of the MPS-Frost, and the SPP scale of the MPS-HF. Factor 2, labelled *positive striving*, consisted of high loadings for the PS and O scales of the MPS-Frost, and the SOP and OOP scales of the MPS-HF. Of note, the maladaptive evaluation concerns factor was positively correlated with both depression and negative affect, as assessed by the Beck Depression Inventory (BDI; Beck & Steer, 1987) and the Positive and Negative

Affect Symptom Scale (PANAS; Watson, Clark, & Tellegen, 1988), respectively. However, the maladaptive evaluation concerns factor was not correlated with positive affect as assessed by the PANAS. Conversely, the positive striving factor was positively correlated with positive affect but not with depression or negative affect scores. Frost et al. (1993) conceptualized these two factors as representing maladaptive versus adaptive dimensions of perfectionism.

In a more recent psychometric investigation with a university student sample, Bieling and colleagues (2004) used confirmatory factor analysis to test a number of models of perfectionism using both MPS measures. They found that a model that incorporated two factors, one corresponding to a maladaptive perfectionism and the other adaptive perfectionism, was a better fit to the data than a unitary perfectionism model. They also examined relationships between these two types of perfectionism with measures of psychological maladjustment. They found that both maladaptive and adaptive forms of perfectionism were positively correlated with symptoms of depression, anxiety, and stress. However, regression analyses with both forms of perfectionism entered as predictors revealed that only maladaptive perfectionism uniquely predicted these symptoms of maladjustment. Thus, while maladaptive perfectionism was related to psychological distress, adaptive perfectionism was not a significant predictor of distress above and beyond what was accounted for by maladaptive perfectionism.

A number of other empirical investigations have focused on testing the validity of conceptualizing perfectionism as adaptive or maladaptive by examining the potential positive and negative correlates of each (e.g., Bieling, Israeli, & Antony, 2004; Bieling,

Israeli, Smith, & Antony, 2003; Chang, Watkins, & Banks, 2004; Cox, Enns, & Clara, 2002; Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Dunkley, Zuroff, & Blankstein, 2003; Enns, Cox, Sareen, & Freeman, 2001; Hill et al., 2004; Lynd-Stevenson & Hearne, 1999; Parker & Stumpf, 1995; Rice, Ashby, & Slaney, 1998; Rice, Lopez, and Vergara, 2005; Stumpf & Parker, 2000; Suddarth & Slaney, 2001). In the majority of these studies, the dimensions of adaptive and maladaptive perfectionism were conceptualized as some combination of the facets that Frost et al. (1993) originally found to form the 2 factors labelled *positive striving* and *maladaptive evaluative concerns*, though different labels are used depending on the study (e.g., functional and dysfunctional, positive and negative, healthy and unhealthy, active and passive). This research has shown that maladaptive forms of perfectionism have been consistently linked with the following negative outcome variables: higher levels of perceived stress (e.g., Chang et al., 2004); higher levels of negative affect in the form of depression, anxiety, hopelessness, and neuroticism (e.g., Bieling et al., 2003; Bieling et al., 2004; Hill et al., 2004; Parker & Stumpf, 1995; Stumpf & Parker, 2000); lower levels of positive affect (e.g., Bieling et al., 2003; Change et al., 2004; Dunkley et al., 2003); increased suicidal ideation (e.g., Enns et al., 2001); external locus of control (e.g., Suddarth & Slaney, 2001); avoidant coping and self-blame (e.g., Dunkley et al., 2000, 2003); interpersonal sensitivity, hostility, and paranoia (Hill et al., 2004); and higher levels of shame and guilt (Fedewa et al., 2005). However, findings related to adaptive forms of perfectionism have not been as consistent. In a recent review paper, Stoeber and Otto (2006) summarize research that has examined adaptive forms of perfectionism. They

note that a number of studies have demonstrated links between adaptive dimensions of perfectionism and a variety of positive outcome variables, such as positive affect and life satisfaction (Chang et al., 2004), conscientiousness (Cox et al., 2002; Enns et al., 2001; Parker & Stumpf, 1995), active coping (Dunkley et al., 2000), and higher academic achievement (Bieling et al., 2003; Enns et al., 2001). However, some studies have found that adaptive perfectionism dimensions are significantly associated with negative outcome variables, such as negative affect in the form of depression, anxiety, and neuroticism (e.g., Bieling et al., 2004; Cox et al., 2002; Enns et al., 2001; Hill et al., 2004), higher levels of perceived hassles (Dunkley et al., 2000), and lower levels of well-being and perceived social support (Hill et al., 2004).

Stoeber and Otto (2006) suggest that this discrepancy in findings for adaptive forms of perfectionism may be, at least partly, attributable to the demonstrated overlap of adaptive and maladaptive dimensions of perfectionism. They note that in previous investigations, correlations between adaptive and maladaptive perfectionism have ranged from .40 to .70. With such substantial overlap, they argue that the adaptive form of perfectionism is "contaminated" with the maladaptive form of perfectionism, and thus the former may show inflated correlations with negative outcome variables. In order to examine this issue, Stoeber and Otto reinspected those studies that reported substantial correlations between adaptive and maladaptive perfectionism dimensions and reanalyzed the data provided. They computed partial correlations between adaptive perfectionism and outcome variables while partialling out the effects of maladaptive perfectionism. In their review, these authors reported that these new computations resulted in findings that

more consistently supported the view that adaptive perfectionism was related to positive characteristics. That is, for two studies, significant correlations between adaptive perfectionism and negative characteristics were no longer significant after partialling out the effects of maladaptive perfectionism (Bieling et al., 2003; Dunkley et al., 2000). For a study initially reporting null findings, partial correlation analyses revealed a significant relationship between adaptive perfectionism and higher self-esteem (Rice et al., 1998) and one study initially reporting a relationship between adaptive perfectionism and negative outcome, showed a significant relationship between adaptive perfectionism and higher levels of perceived social support and lower levels of negative affect and self-blame (Dunkley et al., 2003). Thus, the overlap between adaptive and maladaptive dimensions of perfectionism must be an important consideration in determining the validity of distinguishing between these two proposed types of perfectionism.

Despite accumulating evidence supporting the conceptualization of perfectionism as adaptive or maladaptive in type, there continues to be much theoretical debate about the validity of such a distinction and some researchers argue that this model is problematic. Most notably, Hewitt and Flett (2006) have argued that this distinction must be carefully evaluated and the impact of this distinction must be noted. Conceptualizing perfectionistic personality as having maladaptive or adaptive types does have important clinical consequences. If, in fact, adaptive perfectionism exists and is truly "healthy", therapists might actively work to modify and transform maladaptive perfectionism into adaptive perfectionism. However, if even adaptive perfectionism is ultimately

"unhealthy", therapists would be much better off helping clients minimize and decrease all perfectionistic tendencies and motivations.

Hewitt and Flett (2006) have argued that the research to date has been much more consistent in showing that maladaptive perfectionism is linked with negative processes and outcomes and the research showing the "healthy" or positive outcomes of adaptive perfectionism is equivocal. However, the work by Stoeber and Otto (2006) suggests that part of the problem may be due to the overlap between adaptive and maladaptive perfectionism and future research considering this overlap may help to clarify this inconsistency. Hewitt and Flett also argue that although in some studies adaptive dimensions of perfectionism may be related to positive outcomes (e.g., higher academic achievement, positive affect, self-esteem), even "positive" perfectionism is pathologically motivated by a fear of failure and an intolerance to failure. This has yet to be empirically tested. In addition, and important to the current investigation, they argue that adaptive forms of perfectionism and the consequences of such a personality style need to be examined in the broader context of the individual's environment and experiences. The majority of previous investigations examining adaptive and maladaptive forms of perfectionism and their relationships with negative and positive outcome variables and characteristics have been cross-sectional in design and correlational in nature. Though this research suggests that what has been labelled as adaptive perfectionism may indeed be linked with positive or healthy characteristics, these studies cannot tell us what happens to these individuals over time and in the face of setbacks and failures. According to a diathesis-stress model, the negative/harmful consequences of adaptive

perfectionism may manifest or express themselves only when relevant stressful life events or experiences occur. Thus, it may be the case that even adaptive perfectionists experience negative consequences related to this personality orientation, but these negative effects cannot be seen as directly or readily as the negative effects associated with maladaptive perfectionism. At this time, the validity and usefulness of defining perfectionism as adaptive versus maladaptive remains debatable. One of the major aims of the current investigation is to examine adaptive and maladaptive perfectionism from a broader, more contextual framework, by testing a diathesis-stress model in a longitudinal study.

The current investigation assessed for perfectionism using both the MPS-Frost and MPS-HF. Specifically, the utility of distinguishing maladaptive and adaptive dimensions of perfectionism was evaluated. The two factors, maladaptive evaluative concerns and positive striving were derived from both MPS measures and used as our measures of maladaptive and adaptive perfectionism. Second, the utility of looking at both intrapersonal and interpersonal aspects of perfectionism was examined – namely, the dimensions of SOP and SPP from the MPS-HF.

Perfectionism and Psychopathology

There has been much research examining the association between various dimensions of perfectionism and psychopathology. Research has shown links between trait perfectionism and depression (e.g., Hewitt & Flett, 1991b, 1993; Frost et al., 1993), anxiety disorders such as social anxiety and social phobia (e.g., Saboonchi & Lundh, 1997; Juster, Heimberg, Frost, & Holt, 1996), and obsessive-compulsive disorder (e.g.,

Frost & Steketee, 1997; Frost, Steketee, Cohn, & Greiss, 1994; Rheaume, Ladouceur, & Freeston, 2000), eating disorders such as anorexia and bulimia (e.g., Bastiani, Rao, Weltzin, & Kaye, 1995; Hewitt, Flett, & Ediger, 1995), sexual dysfunction (DiBartolo & Barlow, 1996), psychosomatic disorders (Forman, Tosi, & Rudi, 1987), and excessive anger and hostility (Saboonchi & Lundh, 2003). Effect sizes for the associations between perfectionism and these various forms of psychopathology have ranged from moderate to large, with studies reporting correlations (*r*) ranging from .23 for anger (e.g., Saboonchi & Lundh) up to .55 for depression (e.g., Frost et al., 1993).

Though the link between perfectionistic personality and a variety of psychological problems has been well documented, the issue of *specificity* has surfaced regarding this association. Given that perfectionism has been linked with a wide variety of disorders, it is unclear whether this personality style is specifically related to certain types of symptoms or disorders. Researchers have been especially interested in examining the relation between perfectionism and depression. A number of studies with both university students and clinical samples have consistently found a significant positive association between levels of depressive symptomatology and SPP (Enns & Cox, 1999; Flett, Besser, Davis, & Hewitt, 2003; Flett, Hewitt, Blankstein, & O'Brien, 1991; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Hewitt & Flett, 1991b, 1993; Sherry, Hewitt, Flett, & Harvey, 2003; Wyatt & Gilbert, 1998). Research has also shown an association between depressive symptoms and SOP in depressed patients (Enns & Cox, 1999; Hewitt & Flett, 1991b, 1993; Sherry et al., 2003). There has also been some research that has investigated the relationships between the Frost dimensions of perfectionism and

depression. Generally, these studies have been conducted with university students and have found that total perfectionism scores on the MPS-Frost, as well as the CM and DA subscales, are associated with depressive symptoms (Chang, 2002; Frost et al., 1993; Minarik & Ahrens, 1996).

Research has also shown that trait perfectionism is associated with anxiety symptoms and disorders. Social phobia and obsessive-compulsive disorder have been the most widely investigated, likely due to clinical observations that patients with these disorders are often strongly perfectionistic (Antony, Purdon, Huta & Swinson, 1998). In studies with university students, social anxiety has been found to correlate strongly with SPP and CM and DA (Blankstein, Flett, Hewitt, & Eng, 1993; Flett, Hewitt, and DeRosa, 1996; Saboonchi & Lundh, 1997). In a clinical study conducted with patients diagnosed with a variety of anxiety disorders, Antony et al. (1998) found that levels of SPP were higher in individuals diagnosed with social phobia compared to individuals diagnosed with OCD, specific phobia and normal controls. Several studies have also shown that groups of clinically diagnosed OCD patients and those with subclinical OCD symptoms score higher on CM and DA than non-OCD, control groups (e.g., Frost & Steketee, 1997; Frost, Steketee, Cohn, & Griess, 1994).

Thus, research suggests that particular dimensions of perfectionism (namely SPP, CM, and DA and sometimes SOP) are related to both depressive and anxious symptomatology. This is not that surprising, given that symptoms of anxiety are often comorbid or are confused with symptoms of depression. It is well known that the rate of comorbidity between depression and anxiety is quite high with some studies reporting

rates as high as 67% (Dobson & Cheung, 1990). In addition, many self-report instruments that purportedly assess depression may also tap into symptoms of anxiety or more generally, negative affectivity. Thus, without assessing for both depression and anxiety using instruments that tap unique symptoms of each syndrome it is not possible to discern whether dimensions of perfectionism predict specific types of psychopathological symptoms or whether they are simply related to a broad range of negative affective symptoms (i.e., general negative affect or distress common to a variety of affective disorders). For the majority of the above reviewed studies, only one or the other of the disorders was assessed (i.e., depression *or* anxiety, not both), or non-specific instruments were used to assess for symptoms. In order to more closely examine this issue, the current investigation assessed for symptoms related to both depression and anxiety over time using a measure aimed at distinguishing the unique symptoms of each syndrome. More specifically, the Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991) was selected because it has been shown to provide unique or specific dimensions related to depression and anxiety. This self-report questionnaire provides two conceptually and psychometrically distinct factors that tap relatively unique symptom clusters of depression and anxiety (Clark & Watson, 1991; Watson, Clark, Weber, & Assenheimer, 1995; Watson, Weber, Assenheimer, & Clark, 1995). One factor, labelled Anhedonic Depression (AD) is characterized by anhedonia and an absence of positive affect, which are symptoms specific to depression. The second factor of interest, labelled Anxious Arousal (AA), is characterized by somatic tension and hyperarousal, which are specific to anxiety. Thus, this study examined these two specific symptom clusters with

the aim of elucidating the relationships between dimensions of perfectionism and psychopathological symptoms above and beyond general negative affect or distress (i.e., non-specific symptoms common to a variety of affective disorders).

Diathesis-Stress Models

The research reviewed above suggests that perfectionism is a vulnerability factor for a variety of psychopathological symptoms. However, research that addresses *how* dimensions of perfectionism come to be associated with maladjustment is just beginning to emerge. Hewitt and Flett (1993, 2002) have argued that perfectionism can be conceptualized as operating within a diathesis-stress type framework. Before discussing the particulars of their specific framework, a general discussion of diathesis-stress models is useful.

In the most basic form, a diathesis-stress model suggests that some individuals have an internal predisposition or vulnerability for a particular disease. However, the expression of the disease depends on whether the vulnerability is triggered or activated by some external stressor. Originally, these models conceptualized the diathesis as being constitutional or biological in nature (e.g., an individual having a genetic predisposition for schizophrenia) (Meehl, 1962). Given the assumed stability and temporal precedence of the diathesis, the model was straightforward – the diathesis existed, a stressor activated the diathesis, and the disorder expressed itself. However, in the last several decades, researchers have been interested in examining *personality* or *cognitive* variables as diatheses for various forms of psychopathology, with a considerable amount of research focusing on predisposing factors for depression (e.g., Abramson et al., 1999; Beck, 1987;

Davila, Hammen, Burge, Paley, & Daley, 1995; Pothoff, Holahan, & Joiner, 1995; Robins & Block, 1988).

With this surge of research interest, a number of conceptual and methodological issues have surfaced. First, theorists have noted that personality or cognitive diatheses may in fact have an influence on stress (see Monroe & Simons, 1991). For example, a particular personality style may influence the amount and type of life stress remembered and reported. In addition, a personality diathesis may contribute to the actual generation of life stress. Hammen (1991) proposed that certain maladaptive personality characteristics could result in the actual generation of stressful life events. A comprehensive understanding of the role of a given personality diathesis in the onset of psychopathology must address the possibility of reciprocal interactions between the diathesis and life stress.

A second important issue pertains to the measurement of life stress. "Stress" is such a ubiquitous and vague term that some researchers argue that it has become a useless concept (Ader, 1980). Life stress researchers have attempted to more clearly define the term by distinguishing between (a) the actual stressful events that people experience and (b) the psychological and physiological consequences of the events. Thus there is a distinction between the objective *stressful event* and the subjective *appraisal* of the stressful event. For example, two people who work at the same company and have the same job are fired. The objective stress event is the same for both individuals – that is, getting fired. However, the perceived or appraised stress experienced by the two individuals could be vastly different. One individual could interpret the termination as

devastating and experience a great deal of anxiety and worry, while the other individual could reframe the situation as an opportunity to try something new and experience minimal negative feelings or thoughts about the event. The first individual may have a personality style characterized by focusing on failures and ruminating about negative events and the termination may trigger this diathesis, leading to depression. However, the second individual, not having the same personality diathesis, does not become depressed. This example illustrates that in understanding how a diathesis and stress interact, one needs to make a distinction between the objective stressful event and the appraisal of the event. If in the above example, only measures of perceived or appraised stress were examined (e.g., self-reported levels of stress related to the event within a particular timeframe), then one might have wrongly concluded that the second individual had not experienced a stressful life event when in fact she had, she just did not perceive it as stressful.

Another layer of complexity in assessing stressful events is that contextual factors must be considered in order to appropriately determine whether a given event is objectively stressful to a particular individual. For example, getting fired from one's job may be objectively very stressful for a single mother of five children with no other means of support and no savings. However, this same event may not be objectively stressful for a woman married to a rich lawyer, who only took the job in the first place to have some extra pocket money. These contextual features would have an impact on whether an event was coded as objectively stressful or not. Thus, the same event – "fired from one's job" – may have different consequences both because (a) the objective contextual

features of the event might differ from person to person, *and* (b) the event might be appraised differently by different people depending upon their personality diatheses. Both of these issues are taken into consideration the design of the present investigation.

The accurate measurement of stressful life events and distinguishing objective and subjective elements of the events must be considered when trying to tease apart potential diathesis-stress interactions. There have been two major approaches used in the assessment of stressful life events (see Katschnig, 1986 for a more thorough review). One approach involves the use of self-report checklists of a variety of life events. Normally, respondents are asked to indicate, via a paper-and-pencil questionnaire, whether a given event has occurred during a specified time frame. The other approach involves the use of semi-structured interviews in which respondents are asked about the occurrence of a variety of life events during a specified time period. Both approaches have advantages and disadvantages. Self-report checklists are easy to administer and score. They do not involve extensive time and labour, and this is an important practical advantage, especially for larger-scale studies. However, some life event researchers have criticized the use of self-report checklists. One of the main criticisms relates to the potential for considerable variability in the types of experiences included in a seemingly homogeneous life event category (Dohrenwend et al., 1987). Monroe and Simons (1991) provide a good example. An item on a life event checklist may be "illness of a close family member". Two different individuals may endorse this same item but the actual objective experiences of the two individuals may be vastly different. One particularly worrisome individual may remember her child's one-day bout with the flu, while another

individual may endorse the item because her husband had a heart attack. Thus, the stress measurement contains considerable variability because of idiosyncratic interpretations by the respondents. In addition, a diathesis may have an influence on the number and type of life events endorsed – that is, the interpretation and rating of items can be systematically biased by the nature of a diathesis (e.g., a woman endorsing the occurrence of a serious illness because her child had the flu may have an underlying diathesis characterized by chronic worry and anxiety). Without more information about the objective, stressful event itself, it is difficult to disentangle the effects of the diathesis and the stress event.

Proponents of investigator-based approaches for assessing stressful life events argue that diathetic biases and the potential for misinterpretation of life events is greatly reduced with the use of interviews. Upon the endorsement of a particular event, the interviewer follows up by asking contextual questions about the event. For example, if a respondent endorsed a serious illness of a family member during an interview, questions regarding the objective features of the event (e.g., duration, severity, consequences of illness) would be asked. Then, these responses would be independently rated against predetermined criteria to determine the presence and severity of stressful events. The main disadvantage of this interview approach is that it is time consuming (such interviews may be an hour or more and additional time is needed to rate endorsed events) and labour intensive (trained interviewers, as well as trained raters are required). This type of approach may not be practical or feasible in some cases.

The current investigation attempted to draw on the advantages of both self-report checklist and interview-based approaches. The assessment of stressful life events was based on self-report questionnaires. However, elements of the interview-based approach were incorporated into these questionnaires. For example, contextual questions pertaining to the objective features of two specific stressful events were included and responses were independently rated for severity (i.e., the level of psychological threat associated with the stressful event). In addition, the stressful life event checklist that was used in this study was specifically developed to minimize possible misinterpretation and the influence of diathetic biases (e.g., use of specific examples as anchors).

Perfectionism and Stress

Hewitt and Flett (2002) have outlined a framework that describes how perfectionism interacts with and influences stress to produce and maintain various psychopathological symptoms. They attempt to account for the added complexities of the diathesis-stress model by proposing a number of mechanisms by which perfectionism and stress can lead to maladjustment. Two of these proposed mechanisms were addressed in the current investigation: (a) stress enhancement and (b) stress generation. These processes are described below.

Perfectionism and Stress Enhancement

One proposed process by which perfectionism influences stress is via stress enhancement or reactivity. Here the focus is explicitly on how an individual appraises or interprets a given event, that is, the level of perceived stress. Hewitt and Flett (2002) suggest that perfectionists have a tendency to appraise negative events, particularly

failure events, as more stressful and more negative than nonperfectionists. Perfectionists have a tendency to magnify the negative impact of stress because they derive their sense of self-worth from their perfect performance (Hewitt & Flett, 1993). Thus, when they fail to achieve a set goal, it is not just that they failed at that particular task but that they have failed as a person, that they are worthless and incompetent. For example, a number of studies have found that perfectionism is associated with self-blame and a tendency to overgeneralize failure to all aspects of the self (e.g., Flett, Russo, & Hewitt, 1994; Hewitt & Flett, 1991a). Fry (1995) also suggests that perfectionists view stressful events as more ego-involving than nonperfectionists, thereby increasing their perception of the stressfulness of those events. In addition, perfectionistic people may have a tendency to ruminate about their failures to achieve set standards (Flett & Hewitt, 2002). Rumination acts to maintain the negative thoughts and feelings about the failure event, increasing the perceived stressfulness of the event for the individual.

Perfectionism and Stress Generation

In recent years, theory and research examining diathesis-stress models in psychopathology have addressed the possibility that particular diatheses may be associated with the generation or creation of stressful events (Monroe & Simons, 1991). In the case of perfectionism, it is very possible that highly perfectionistic people, by way of their unrealistic setting of goals and constant negative self-evaluation, generate stressful events for themselves, making them susceptible to psychological maladjustment. Hewitt and Flett (2002) hypothesize that perfectionists have a tendency to engage in behaviours, make choices, or pursue unrealistic goals that create stressful events or

circumstances. Thus perfectionists, compared to nonperfectionists, may be exposed to a greater number of stressful or failure events. An important distinction needs to be made between the generation of actual, objective stressful life events and the generation of greater levels of perceived stress because of the appraisal of events as failures. For example, a highly perfectionistic student, because of her need for perfection and stellar quality for all her written work, may become paralyzed to the point that she cannot complete or hand in any of her assignments. Thus, she fails her courses. This student's perfectionistic tendencies result in the generation of actual failure events. However, excessive perfectionism may also be associated with the tendency to *appraise* events as more negative and thus more stressful than nonperfectionists. For example, a highly perfectionistic student may receive a mark of 90% on an assignment (for most individuals a positive event) and experience the event as very stressful because she becomes focused on a comment on the paper indicating an area that needed improvement. To this perfectionistic student, that one criticism indicates that she has failed to write a perfect assignment. In this latter example, perfectionism results in the generation of more perceived stress (i.e., stress enhancement), but not in the generation of an actual, objective stressful event. Hewitt and Flett (2002) do not make an explicit distinction between objective and perceived stress in their stress generation model. However, most researchers interested in stress generation conceptualize the process as the creation of actual stressful events, not just an increase in appraised stress (e.g., Hammen, 1991).

Perfectionism and Type of Stress Event

This review of stress enhancement and stress generation highlights the complex interrelationships among dimensions of perfectionism, stress, and psychological maladjustment. In addition to these processes, Hewitt and Flett (1993) have suggested that examining the type of stress event is important, especially in relation to the onset and maintenance of depression. In their *specific-vulnerability hypothesis* they suggest that perfectionists should be particularly vulnerable to experience distress in response to specific types of events. They proposed a diathesis-stress model linking certain dimensions of perfectionism, particular types of life events, and depressive symptoms. The model is based on the idea that stressors are especially likely to lead to depression if those stressors pose a particular threat to the individuals' core sense of self (Oatley & Bolton, 1985). Stressors that are congruent with the diathesis are considered more ego-involving and thus are experienced as more stressful and aversive than non-congruent stressors. In effect, the negative impact of the stressor is enhanced and the perfectionistic individual is susceptible to experiencing depression, anxiety, and other problems.

More specifically, Hewitt and Flett (1993) hypothesized that an SOP personality diathesis would be most likely triggered by achievement-related stressors. Individuals high in SOP are achievement-focused, and, thus, failure to meet achievement-related goals would be considered a blow to the individual's ego and sense of self, namely because the achievement standards are self-imposed and self-motivated. By contrast, Hewitt and Flett hypothesized that an SPP diathesis would be most likely triggered by interpersonally-related stressors. Individuals high in SPP strive for perfection because of

a high need for approval from others and a fear of negative evaluation from others, thus their perfectionistic motivations are externally motivated (Hewitt & Flett, 1991a). In a study examining the relationships between the MPS-HF dimensions of perfectionism and interpersonal functioning, Hill, Zrull, and Turlington (1997) found that while SOP was generally related to positive interpersonal behaviours and low levels of interpersonal distress and problems, SPP was related to maladaptive patterns of social interaction, a lack of interpersonal satisfaction, and interpersonal distress. They found that the tendency to believe others have high expectations of oneself (the core feature of SPP) was associated with a diverse array of "neurotic" interpersonal behaviours for women in their sample such as distrust, low empathy, social anxiety, difficulty expressing anger, gullibility, over-generosity and permissiveness with others, attention seeking, trying too hard to please others, too self-disclosing, and unable to spend time alone. Men high in SPP were found to display emotional distance, aggressive, distrustful, non-empathic, manipulative, and suspicious interpersonal tendencies and behaviours. The findings of this study support the notion that individuals high in SPP are likely to find interpersonally stressful life events particularly distressing.

Research Examining Perfectionism Diathesis-Stress Models

To date, there have been several studies that have specifically tested a diathesis-stress model linking perfectionism and psychopathology, mostly depressive symptoms (Chang & Rand, 2000; Enns & Cox, 2005; Enns, Cox, & Clara, 2005; Flett, Hewitt, Blankstein, & Mosher, 1995; Hewitt & Flett, 1993; Hewitt, Flett, & Ediger, 1996). In terms of the proposed process of *stress enhancement*, Hewitt and Flett (1993) tested a

diathesis-stress model linking perfectionism with depression in two separate clinical samples (patients with unipolar depression and patients from an acute care clinic). Patients were asked to complete the MPS-HF, the BDI, and the Hassles Scale (Delongis, 1985). The Hassles Scale is a self-report measure that measures respondents' *appraisal* of hassle events as stressful. Participants rated on a 4-point scale how much of a hassle each item was on a particular day. In order to also test the specific vulnerability hypothesis, three raters independently indicated which of the hassles were in the achievement domain and which were in the interpersonal domain. This study found that, in both patient samples, SPP and SOP were positively correlated with both appraised stress for achievement hassles and appraised stress for interpersonal hassles, suggesting that perfectionism is indeed related to higher levels of appraised stress and providing support for the stress enhancement hypothesis. In addition, Hewitt and Flett found that in both clinical samples, SOP interacted with appraised stress for achievement hassles to predict BDI scores. That is, patients who were high in SOP experienced increased depression as appraised stress for achievement hassles increased. For the sample comprised of patients with unipolar depression, SPP interacted with appraised stress for interpersonal hassles to predict BDI scores. That is, patients who were high in SPP experienced increased depression as appraised stress for interpersonal hassles increased. Thus, this study provides preliminary support for the stress enhancement process, as well as support for the perfectionism specific vulnerability hypothesis.

In another study, Flett et al. (1995) examined the dimensions of the MPS-HF in predicting BDI scores in a sample of university students. To test a stress-enhancement

model, they also asked students to complete the Life Experiences Survey (LES; Sarason, Johnson, & Seigel, 1978). This is a self-report measure that asks respondents to indicate whether they have experienced a particular life event in a specified period of time and then rate the impact of the event on a 7-point scale ranging from *extremely negative* to *extremely positive*. There are several ways to score the LES but the authors used the summed impact ratings for positive life events and the summed impact rating for negative life events. That is, they used the *appraisals* of the events as indicators of level of stress. Flett et al. (1995) found that both SPP and SOP were positively correlated with appraisals of negative life events, providing evidence for the stress enhancement process. In addition, they found that the interaction between SOP and appraisals of negative life events was also a significant predictor of concurrent depression scores. Thus, students who were characterized jointly by high levels of SOP and appraised stress tended to report the highest levels of depressive symptoms.

The findings of the above two studies provide preliminary support for the stress-enhancement process linking perfectionism and depression. One of the main goals of the current study was to draw from these important early studies and further examine the stress enhancement process. First, because these two early studies involved the prediction of *concurrent* depressive symptoms, it is unknown whether the interaction between perfectionism and life stress would predict depression symptoms over time. Thus, the current study was longitudinal in design. Second, these early studies assessed only symptoms of depression and therefore it is unknown whether perfectionism poses a risk specifically for depression, or is a vulnerability factor for negative affect in general.

Thus, the current study will assess for specific symptoms of depression and anxiety. Finally, and most importantly, the measurement of life stress in these early studies did not allow for the disentanglement of objective and subjective stress. That is, the measure of life stress was the sum of the ratings for hassles or negative events, that is, the total *appraised level of stress* of a variety of hassles/events, not the level of *stress per se*. This is not to say that perceived stress is unimportant. In examining stress enhancement, a measure of appraised stress is necessary because, essentially, one is interested in how the individual *reacts* to a given stressful event. The prediction is that perfectionists will have a greater stress reaction and experience more distress to a given negative event. However, these studies did not include a measure of the objective level of stress, and therefore it is difficult to disentangle the effects of the diathesis and the stress. That is, it is difficult to know whether the perceived stress is in relation to actual stressful events or based on the fact that the person's diathesis itself results in the interpretation of minor, trivial events as very significant and dire. Without an adequate measure of the level of actual, objective stress, one cannot rule out the possibility that the diathesis essentially overrides environmental input, making external stress factors a negligible component of the model (Monroe & Simons, 1991).

Chang and Rand (2000) also examined a potential diathesis-stress mechanism (i.e., stress enhancement) in a sample of university students. Their measure of stress was derived from the Perceived Stress Scale (PSS; Cohen et al., 1983), which is a 14-item measure of self-appraised stress (e.g., "In the last month, how often have you been upset because of something that happened unexpectedly?"). Respondents rate the extent to

which they agree with statements on a 5-point Likert-type scale ranging from "never" to "very often". Higher total scores are seen to reflect greater perceived stress. Chang and Rand found that SPP interacted with perceived stress to predict psychological symptoms (an aggregate score of the Depression, Anxiety, and Hostility subscales of the Symptom Check List – 90 – Revised [SCL-90-R; Derogatis, 1983]) and hopelessness (as assessed by the Beck Hopelessness Scale [HS; Beck, Weissman, Lester, & Trexler, 1974]). Again, a major limitation of this study involves the measure of appraised stress. Participants' responses on the PSS are open to the influence of diathetic biases – the highly perfectionistic respondent may report a much higher level of stress than a nonperfectionistic respondent, but this effect may be accounted for solely by the perfectionists personality style, not that they are appraising objective events as more stressful than their nonperfectionistic counterparts. Thus, at this time, the process of perfectionistic stress enhancement has not been thoroughly investigated.

Several studies have also examined the process of perfectionistic *stress generation*. Hewitt, Flett, and Ediger (1996) conducted a longitudinal study examining their dimensions of perfectionism as predictors of depression over time. This study was conducted with a sample of current and former depressed patients. Participants completed the MPS-HF and the BDI during the time 1 evaluation, and the BDI and the Life Events Inventory (LEI; Cochrane & Robertson, 1973) at the Time 2 evaluation 4 months later. The LEI is a self-report checklist of life events. The measure of stress used in the study was the total frequency of negative life events. An additional goal of the study was to examine the specific-vulnerability hypothesis (i.e., stressors congruent to

diathesis result in greater stress and thus are more likely to be associated with psychopathology than stressors that are incongruent with diathesis). Thus, three raters categorized the negative life events from the LEI into achievement and interpersonal types of stressors. They found that both SPP and SOP were positively correlated with the number of stressful interpersonal events, suggesting that perfectionism is related to the experience of more stressful events over a specified period of time and providing some support for perfectionistic stress generation. In addition, these authors found that after controlling for Time 1 depression, SOP interacted only with achievement stress to predict Time 2 depression. SPP did not interact with achievement or interpersonal stress to predict Time 2 depression, but it did predict Time 2 depression as a main effect. Thus, this study provided some support that perfectionism, especially SOP, interacts with achievement stress to pose a vulnerability to depression.

Two more recent investigations have examined diathesis-stress models linking perfectionism and depression, with specific focus on the process of stress generation (Enns & Cox, 2005; Enns, Cox, & Clara, 2005). Enns and colleagues (2005) examined the relationships among perfectionism, stress, and depression in a longitudinal study with a sample of first-year medical students. Participants completed the MPS-HF, MPS-Frost, the BDI, and the HS at the Time 1 evaluation and the LEI, the BDI, and the HS at the Time 2 evaluation, about 5 months later. Consistent with the Hewitt et al. (1996) study, the measure of stress was the total frequency of negative life events on the LEI. The authors were interested in testing both the specific vulnerability hypothesis and a more general diathesis-stress model, in linking perfectionism with symptoms of depression and

hopelessness. First, they found that none of the perfectionism dimensions examined (i.e., SOP, SPP, CM, and DA) were significantly correlated with number of life events, which does not support the hypothesis of stress generation. In addition, the theoretically matched interactions between perfectionism and stress as outlined in the specific vulnerability hypothesis (e.g., SOP X Achievement Stress Events, SPP X Interpersonal Stress Events) were not found to significantly predict symptoms of Time 2 depression or hopelessness scores. However, when the authors examined a more general diathesis stress model (i.e., perfectionism dimension X total number of stress events), they found that SPP, DA, and CM all interacted with total number of stress events to predict time 2 depression and hopelessness scores. Thus, this study provides some evidence to support a general diathesis-stress model, linking perfectionism, stress, and depression symptoms.

In another recent study, Enns and Cox (2005) evaluated whether the perfectionism specific vulnerability model could account for *persistence* of depression symptoms over a 1-year period in a sample of outpatients diagnosed with clinical depression. Thus, unlike all previous research, which looked at the role perfectionism and stress in the *onset* or *development* of depressive symptoms, this study examined the potential role perfectionism and stress had in the *maintenance* of depressive symptoms in individuals already diagnosed with depression. Patients completed the MPS-HF and the BDI during the time 1 evaluation and the LEI and the BDI during the time 2 evaluation (1 year later). These authors found that SPP was positively correlated with the number of achievement and interpersonal events as assessed by the LEI, providing support for perfectionistic stress generation. In addition, using logistic regression analyses where the dependent

variable was remission status (0 = remission, indicated by time 2 BDI score of less than or equal to 9; 1 = nonremission indicated by time 2 BDI score of greater than 9), they found that the interaction between SOP and number of achievement events significantly predicted membership in the nonremission group. The other theoretically matched interaction of SPP and number of interpersonal events was not a significant predictor of remission status. Thus, this study provides partial support for the perfectionism specific vulnerability hypothesis, in that depressed individuals who set high standards and strived to attain self-imposed achievement-related goals (SOP) were more likely to have ongoing depressive symptoms if they encountered achievement-related negative life events. These reviewed studies provide important preliminary evidence for perfectionistic stress generation and a perfectionism diathesis-stress model. However, the assessment of life stress in these investigations was somewhat problematic. The measure of life stress was defined as the total frequency of negative life events (total number, number of achievement, or number of interpersonal) derived from the LEI. Although this measure does seemingly tap into a more objective assessment of life stress (i.e., the number of stressful events over a specified time period), many of the items on the LEI are ambiguous and the potential for misinterpretation is a concern. For example, items such as "Involvement in fight", "Serious restriction of social life", and "Trouble with other relatives (e.g., in-laws)" are quite vague with no examples or anchors for respondents. What one individual assesses as "serious" or "trouble" may be entirely different than what another individual interprets as such. Thus, the current investigation used a

measure that was designed specifically to minimize the potential for misinterpretation of items.

Chapter 2

Objectives of the Current Investigation

This study was conducted with a large sample of university students and was longitudinal in design, with two assessment sessions about four months apart. At each assessment session, students were asked to complete self-report measures of perfectionism, experience of stressful life events, and symptoms of depression and anxiety. The study had two main goals.

The first goal of this study was to examine the hypothesized process of perfectionistic *stress enhancement* with a design that addresses important conceptual and methodological issues related to the assessment of life stress. Specifically, stressful life events were assessed in a way that minimized misinterpretation and potential diathetic biases. That is, two salient life events (one in the achievement domain and one in the interpersonal domain) were selected for examination and both an objective measure of the experience of the events and a subjective measure of the appraised stress in relation to the events was derived. Given that this study examined perfectionism in university students, two negative life events that were likely to be experienced by students were examined.

The first event was poor performance or failure on an important midterm examination. This achievement-related event is one that may be particularly salient to perfectionists. Students were assessed prior to writing a specific exam and asked to report how they expected to perform on the exam (i.e., what grade they expect to receive). Then, after the exam, once students had received feedback, they were assessed

for their actual performance on the exam. In addition, they provided a rating on how much stress they had experienced upon receiving their mark on the exam. That is, participants provided a measure of appraised stress by circling a number from 1 (denoting "no stress") to 5 (denoting "extreme stress"). They were also asked to provide contextual information about the exam event and their particular academic situation (e.g., whether the student was at risk for being put on academic probation, whether the course was being taken as a required or elective course, whether the student currently held a scholarship that required maintaining a particular academic average). Based on the contextual information students provided, trained independent raters determined the level of psychological threat of the event by comparing the individual's responses to vignettes that had been previously rated (see below for more detail regarding the rating system; Brown & Harris, 1978). As aforementioned, this strategy for collecting contextual information related to the experience of stressful events has been widely used in interview or investigator-based methods of assessing for stressful life events. This approach minimizes the endorsement of stressful events based on misinterpretation of the event on the part of the respondent, as well as minimizing potential diathetic biases, criticisms that are often applied to the use of self-report checklists. Thus this procedure allowed for the examination of the stress enhancement process in a way that clearly separated the objective stress event and the appraisal of stress experienced.

The second negative life event that was assessed was the break-up of a romantic relationship. Research suggests that relationship terminations can be severely stressful and especially likely to predict depression onset (Brugha, 1985). Participants were asked

whether they had ended a romantic relationship in the past four months (i.e., 4 months prior to the first session, and the time period between the first and second assessment). They were asked to indicate their level of stress in relation to the break-up (the appraisal of the stressful event). That is, they were asked to circle a number from 1 (denoting "no stress") to 5 (denoting "extreme stress"). In addition, participants were asked a variety of questions aimed at getting contextual information about the stressful event such as the length of the relationship, whether the relationship was sexual, whether they had lived with their ex-partner, and whether they had any children with their ex-partner. Again, these contextual questions provide information about the characteristics of the event so that a sense of the level of psychological threat could be rated. Again, independent raters determined the level of psychological threat of the event by comparing each participant's responses to already rated vignettes.

There were a number of hypotheses that were made about perfectionism operating within a stress enhancement model:

a) Of all participants who actually experienced a stressful event (i.e., poor exam performance, relationship termination), maladaptive perfectionism was predicted to be significantly and positively correlated with the level of appraised stress for the events. Regarding adaptive perfectionism, past research has been inconsistent in demonstrating the adaptive nature of this dimension, thus no specific predictions were made here. If adaptive perfectionism is indeed "healthy", this dimension should not be related to higher levels of appraised stress for either type of event. However, if this dimension is in fact

motivated by a fear of failure, as suggested by Hewitt and Flett (2006), it should be related to higher levels of appraised stress for both events.

b) Within the stress enhancement framework, it was predicted that different dimensions of perfectionism would influence the type of stressful event likely to be appraised as most stressful. Based on the *specific vulnerability hypothesis* (Hewitt & Flett, 1993), I predicted that SOP would be preferentially related to greater appraised stress for the negative achievement event. In contrast, I predicted that SPP would be preferentially related to greater appraised stress for the negative interpersonal event.

c) I also examined the stress enhancement hypothesis within a diathesis-stress framework. First, it was posited that the interaction between maladaptive perfectionism and level of appraised stress (for both types of events) would significantly predict psychopathological symptoms. The examination of the interaction between adaptive perfectionism and level of appraised stress in predicting symptoms was exploratory and thus, no specific predictions were made. Next, based on the specific vulnerability hypothesis, it was posited that the interaction between SOP and appraised stress related to the negative achievement event would significantly predict symptoms. In addition, the interaction between SPP and appraised stress related to the negative interpersonal event would significantly predict symptoms. However, the theoretically unmatched interactions (i.e., SOP X Appraised Stress for Interpersonal Event, SPP X Appraised Stress for Achievement Event) would not be predictive of symptoms. The specific symptom clusters examined in this study were anhedonic depression and anxious arousal, as assessed by the MASQ. Given that the majority of past studies supporting a

perfectionism diathesis-stress model have focused on predicting depression, it was expected that the perfectionism-stress interaction would be predictive of anhedonic depresssion. No past research testing a perfectionism diathesis-stress model has explicitly looked at the prediction of symptoms specific to the syndrome of anxiety (i.e., anxious arousal), but given the characteristics of perfectionistic personality, it was expected that the interaction between perfectionism and stress would significantly predict these symptoms as well.

The second major goal of this study was to examine the process of *stress generation*. Again, the design of the study addressed issues related to the measurement of life stress. The process of stress generation hypothesizes that perfectionists create more stressful events for themselves than do nonperfectionists. Thus, a measure of the number of stressful events experienced over a specified time period was required. A self-report checklist called the Life Events Questionnaire (LEQ; Alloy & Abramson, 1999) was used. This questionnaire was chosen because it had a number of advantages over other self-report checklists and also addressed a number of criticisms of the self-report assessment of stressful events. First, the LEQ was specifically designed to assess for events relevant to college students (e.g., school, family, finances, personal relationships). This increased the likelihood that the items on the LEQ would tap into the types of stressful experiences common to students. Second, LEQ items were written to decrease ambiguity and minimize potential misinterpretation of items. Specific examples and clarification were included for most items. For example, an item assessing for serious illness or injury provided specific information and examples that the respondent could

use as a frame of reference – that is, the illness resulted in permanent disability (e.g., blindness, loss of the use of a limb), the accident or illness required hospitalization, or the illness required missing 2 weeks of work or school. This extra information reduced diathetic biases and the likelihood that a respondent would endorse the item based on a less serious illness (e.g., 24-hour flu). Third, the LEQ does not have items that reflect obvious symptoms of depression and "hierarchical" items where one event is a subset of another event (e.g., failing an exam is a subset of doing poorly in school). This reduces the potential for event redundancies and the reporting of multiple stressful events that were really manifestations of one underlying experience. Thus, the LEQ provided an estimate of the number of objective stressful events experienced by the respondent over a specified period of time.

There are a number of hypotheses that were made about the perfectionism operating within the stress generation process:

a) Maladaptive perfectionism was predicted to be significantly and positively correlated with the number of stressful life events experienced over a 4-month period. Again, analyses specifically examining the adaptive perfectionism dimension were exploratory. If the construct is indeed related to adaptive functioning, the stress generation process would not be seen with this dimension. However, if adaptive perfectionism was inherently motivated by anxiety and fear, then adaptive perfectionism should also be significantly and positively correlated with number of stressful life events.

b) Within the stress generation framework it was predicted that different dimensions of perfectionism would influence the type of stressful events experienced. That is, based on

the specific-vulnerability hypothesis, I predicted that SOP would be preferentially related to the experience of more achievement-related stressful events. However, SPP would be preferentially related to the experience of more interpersonally-related stressful events.

c) This study also examined the stress generation hypothesis within a diathesis-stress framework to predict psychological maladjustment. First, it was posited that the interaction between maladaptive perfectionism and the total number of negative events (regardless of type of event) would significantly predict psychopathological symptoms. The examination of the interaction between adaptive perfectionism and the total number of negative events in predicting symptoms was exploratory and thus, no specific predictions were made. Then, more specifically, based on the perfectionism specific vulnerability hypothesis, the interaction between SOP and the number of achievement related events and the interaction between SPP and the number of interpersonal related events were expected to significantly predict symptoms. However, the theoretically unmatched interactions would not be predictive of symptoms. Again, the symptoms clusters that were examined were anhedonic depression and anxious arousal. In terms of which specific symptom clusters would be significantly predicted, similar hypotheses to those relating to stress enhancement were made for the stress generation process.

The examination of perfectionism is especially relevant to a university student population because research suggests that perfectionism is a significant predictor of poor adjustment in university (e.g., Chang & Rand, 2000). Given the high academic achievement of university students, it is reasonable to hypothesize that many of students have perfectionistic tendencies. Perfectionists are often very successful academically

when they have adequate social support and coping resources (O'Connor & O'Connor, 2003). However, adjusting to the new roles and responsibilities involved with starting university (e.g., developing new social networks, confronting the higher expectations and higher level of competence among one's peers, coping with increased academic demands) is often very stressful for students. Students who are excessive perfectionists may not manage stressful events associated with university as well as their non-perfectionistic peers. They may find themselves with little social support and have difficulty coping with increased pressure. Because perfectionists have rigid and unrealistic standards, when they are faced with stressful life events, they are more likely to engage in avoidance, and experience anxiety, depression, and hopelessness (Halgin & Leahy, 1989). Recognizing and evaluating the influence of perfectionistic motivations can aid in the assessment and treatment of students experiencing difficulty, both those coping with stress, as well as those presenting with more serious problems. In addition, identifying those students at risk for developing more serious disorders and implementing prevention programs would be very beneficial. Examining perfectionism may be one avenue for such a prevention initiative.

Chapter 3
Method

Participants

Participants were recruited from a first-year undergraduate introductory course in psychology at Queen's University. Two consecutive classes of students were asked to participate in this study (i.e., 2005/2006 and 2006/2007 academic years). A total of 519 students (86 men) participated in the Time 1 evaluation. Of these students, 308 (45 men) returned to participate in the Time 2 evaluation (held approximately 4 months later). A total of 16 participants were excluded from further analyses due to significant amounts of missing data. Thus, complete Time 1 data were available for 503 participants (78 men) and complete Time 1 and Time 2 data were available for 301 participants (42 men). The mean age of completers (i.e., those with both Time 1 and 2 data) was 18.26 years (*SD* = 2.03). In terms of ethnicity, the majority of completers were White (70%), followed by Asian (25%), and Other (e.g., Hispanic, Black, Middle Eastern) (5%). The majority of completers (91%) were in their first year of study. Regarding the experience of past or current depression or anxiety: 5% of completers reported having been diagnosed with a depressive or anxious disorder sometime in their life, 11% of completers reported having been treated for depression or anxiety in the past (via medication, therapy, or both), and 2% of completers reported being currently treated for depression or anxiety (via medication, therapy, or both).

Prior to data collection, power analyses were conducted to ensure that the projected total sample size was sufficient to ensure that there was enough statistical

power to detect expected effects. A number of different strategies can be employed to make a determination about the sample size required to have enough statistical power to detect particular effects (see Bausell & Li, 2002). One strategy is to examine prior research with similar designs aimed at answering similar questions that reported statistically significant findings. In the area of perfectionism, stress, and psychopathology, a number of studies have reported significant effects (main effects ranging from R^2 = .03 to R^2 = .18 and interaction effects ranging from R^2 = .03 to R^2 = .07) with sample sizes ranging from N = 103 to N = 225 (see Chang & Sanna, 2001; Enns & Cox, 2005; Enns, Cox, & Clara, 2005; Flett et al., 1995; Hewitt, Flett, & Ediger, 1996; O'Connor & O'Connor, 2003). Thus, a sample size of 301 completers was considered to have enough power to detect similar effects.

Another strategy is to utilize computer software (e.g., GPOWER) designed to calculate required sample sizes to detect effects of a particular magnitude at a specified level of power. A power analysis was conducted for multiple regression analyses, to determine the sample size required to detect effects of small magnitude (i.e., R^2 = .04), with alpha level = .05, observed power = .80, and 3 predictors. The analysis computed a required total sample size of N = 267. Again, a total sample of 301 completers is likely to be sufficient to detect expected effects.

Measures

Demographic Questionnaire

This information sheet contained questions asking for participants' sex, age, year of study, program of study, marital status, and ethnicity. In addition, the questionnaire

included questions about current and past history of psychiatric illness, especially related to past or present episodes of depression and anxiety. Questions about current and past treatment (i.e., medication, therapy) were also included.

Multidimensional Perfectionism Scale (MPS-Frost; Frost et al., 1990)

This is a widely adopted 35-item self-report measure that assesses six dimensions of perfectionism: (1) *Concern Over Mistakes (CM)*, (2) *Organization (O)*, (3) *Parental Criticism (PC)*, (4) *Parental Expectations (PE)*, (5) *Personal Standards (PS)*, and (6) *Doubts About Actions (DA)*. Respondents were asked to read a series of statements designed to tap each of the above dimensions and rate their level of agreement on a 5-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree". In this study, the internal consistencies of the scales from the Time 1 evaluation ($N = 503$) were as follows: CM scale was $\alpha = .87$, O scale was $\alpha = .91$, PE scale was $\alpha = .81$, PC scale was $\alpha = .81$, PS scale was $\alpha = .82$, and DA scale was $\alpha = .72$. Test-retest reliabilities ($N = 301$) were as follows: CM scale was $r = .79$, O scale was $r = .84$, PE scale was $r = .82$, PC scale was $r = .81$, PS scale was $r = .76$, and DA scale was $r = .72$.

Multidimensional Perfectionism Scale (MSP-HF; Hewitt & Flett, 1991a)

This is a 45-item self-report measure that yields three subscales reflecting different dimensions of perfectionism, differing in the source and target of perfectionistic motivations and tendencies. The three dimensions tapped are *Self-Oriented perfectionism (SOP)*, *Other-Oriented perfectionism (OOP)*, and *Socially-Prescribed perfectionism (SPP)*. Respondents rated their level of agreement for a series of statements on a 7-point Likert-type scale ranging from "Disagree" to "Agree". In this study, the internal

consistencies of the scales from the Time 1 evaluation ($N = 503$) were as follows: SOP scale was $\alpha = .82$, OOP scale was $\alpha = .77$, and SPP scale was $\alpha = .86$. Test-retest reliabilities ($N = 301$) were as follows: SOP scale was $r = .91$, OOP scale was $r = .70$, and SPP scale was $r = .78$.

In addition, the combination of both MPS measures yield two domains or factors labelled in previous psychometric investigations as (1) *maladaptive evaluative concerns* and (2) *positive striving* (Frost et al., 1993; Bieling et al., 2004). These two factors reflect maladaptive and adaptive forms of perfectionism and both were examined in this investigation. Subscale scores from both MPS measures (assessed at Time 1) were converted to z-scores. Consistent with previous psychometric investigations, the maladaptive perfectionism score was created by summing the z-scores of SPP, CM, PE, PC, and DA and the adaptive perfectionism score was created by summing the z-scores of SOP, OOP, PS, and O. Internal consistencies for the maladaptive and adaptive perfectionism measures[1] were $\alpha = .93$ and $\alpha = .91$, respectively.

Assessment of Achievement Event

There were two versions of this questionnaire, one for the first assessment and one for the second assessment 4 months later. The Time 1 version asked students to report on their expected performance on an upcoming midterm exam in introductory psychology (i.e., the percent grade they expected to achieve). The questionnaire also included items assessing for the importance of the exam, perceived competency related to achieving their expected mark, and expected performance in the course overall.

[1] Internal consistencies were calculated based on the individual items from all the relevant subscales for each dimension of perfectionism ($N = 503$).

Important to the valid assessment of this event, contextual questions related to the event (e.g., whether the course was necessary for student's major, whether the student was on or at risk for academic probation, whether the student was a scholarship holder requiring maintenance of a specified GPA) were also asked. The Time 2 version of the questionnaire, administered after the midterm, contained questions regarding participant's actual performance on the exam (i.e., percent grade), as well as items assessing for level of importance, satisfaction, and appraised stress related to the exam event. Again, students were asked about their expected performance in the course overall, as well as contextual questions identical to those asked in the Time 1 evaluation. Based on the self-report information provided by participants at both time evaluations, a vignette was created for each participant outlining the context of the achievement event (see Appendix A for samples). Then this vignette was rated by a group of independent raters, based on the rating criteria established by Brown and Harris (1978) for the Life Events and Difficulties Schedule (LEDS). The LEDS is a semi-structured interview for assessing a variety of stressful life events. The rating system for the LEDS involves comparing information about stressful life events derived from an interview (especially the contextual information) to a manual of over 5000 case vignettes representing a wide variety of different types of life events along a continuum of severity. These cases provide anchoring examples to help determine the severity or threat of an individual's life event. Severity is based on factors such as the degree of unpleasantness, threat or danger about the future, and serious practical inconvenience related to the event. This severity rating is determined independent of the respondent's reported feelings about the event.

Relevant to the current investigation, the LEDS manual includes vignettes describing achievement/failure events that can be used as referents when determining the severity of each participant's experience of the exam event. This provided an objective measure of the level of stress related to the exam event. Each event was coded for short-term threat and long-term threat. Short-term threat is defined as the level of threat present in the 1-2 days after the event, while long-term threat refers to the level of threat present 10-14 days after the event. Events were coded for both short- and long-term threat using the following scale: 1-marked, 2-moderate, 3-some, 4-little/none.

Assessment of Interpersonal Event

This questionnaire was administered during the first assessment and again during the second assessment 4 months later. Both versions of the questionnaire were identical. The questionnaire contained questions assessing for whether the respondent recently experienced the break-up of a romantic relationship. Similar to the achievement event questionnaire, questions about the context of the relationship termination were also included (e.g., the length of the relationship, whether the relationship was their first romantic relationship, whether the relationship was sexual, whether they had lived with their ex-partner, whether infidelity had been involved in the break up of the relationship). Again, based on participants' self-report on this questionnaire a vignette was created (one for each time evaluation) outlining the context of the interpersonal event (see Appendix B). These vignettes were independently rated using the LEDS procedure to obtain a measure of severity (or level of psychological threat) of the event. Raters compared the vignettes to coded events in the LEDS manual relating to the end of a romantic

relationship and each vignette was rated for both short-term threat and long-term threat using the 1-marked to 4-little/none scale described above.

Life Events Questionnaire (LEQ; Alloy & Abramson, 1999)

This is a self-report inventory assessing the frequency of major and minor stressful events, as well as chronic stressful situations (i.e., hassles) over a specified period of time (i.e., 4 months). The inventory was designed to be used with a university population and assesses for stressful events and hassles in such domains as academics, friends and family, and finances. This measure was specifically selected as it provides specific examples that act as anchors for each item, reducing the potential for misinterpretation of items and the influence of diathetic biases in responses. A modified version of the LEQ was used in this study. As we were interested in the impact of stressful events, all the items tapping hassles were excluded. Thus, we were left with a total of 47 items tapping minor and major stressful life events. Ten of these items were a priori categorized by the scale developers as achievement related, and 30 items were categorized as interpersonally related. Respondents were required to read each item and check whether the stressful event occurred during the specified time period (i.e., the past four months). Participants were given a calendar outlining the preceding 4 months to assist them in completing this measure.

Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991)

This is a 90-item self-report questionnaire designed to assess the severity of symptoms of anxiety and depression over a specified period of time (i.e., the past week). Participants were asked to indicate the degree to which they endorsed statements on a 5-

point scale (1 = not at all to 5 = extremely). The instrument yields five indices, three of which tap into general negative affect (i.e., symptoms common to both depression and anxiety labeled general distress mixed, general distress primarily related to depression, and general distress primarily related to anxiety). The other two indices, Anxious Arousal (AA) and Anhedonic Depression (AD) tap into specific symptom clusters that discriminate anxiety and depression. AA taps into predominantly physiological symptoms of anxiety, while AD taps into predominantly the absence of positive affect or anhedonia. The MASQ is shown to have good convergent and discriminant validity (Watson et al., 1995a, 1995b). In the current study, the internal consistencies for Time 1 MASQ subscales were as follows: AD scale $\alpha = .74$, AA scale $\alpha = .83$, GDM scale $\alpha = .82$, GD scale $\alpha = .92$, and GDA scale $\alpha = 83$. Test-retest reliability for each scale was as follows: AD scale $r = .55$, AA scale $r = .55$, GDM scale $r = .67$, GD scale $r = .58$, and GDA scale $r = .58$.

Procedure

The Time 1 evaluation was conducted in the second, third, and fourth weeks of classes at the beginning of the academic year (i.e., fall term). Participants were assessed in groups of 10-20 students. All participants received a verbal description of the study, accompanied by a detailed consent form. Participants were told that they were participating in a study investigating how personality factors and the experience of different types of life events affected students' adjustment to university life. Students were told that the study involved two assessment periods in which they would be asked to complete a variety of self-report questionnaires. In addition, students were informed that

their midterm examination grades for Introductory Psychology would be obtained directly from the course coordinator as a measure of academic performance. Participants were informed that participation in the study was completely voluntary, that they were free to withdraw at anytime, and that in no way would their decision to participate or not participate affect their standing in the Introductory Psychology course, the psychology department, or the university. Upon thorough verbal and written explanation, participants were asked to sign the consent form. Then participants were asked to complete the following self-report measures: Demographic Questionnaire, MPS-HF, MPS-FROST, LEQ, Assessment of Achievement Event, Assessment of Interpersonal Event, and MASQ. Upon completion of the session, participants were provided information about university and community mental health resources so that students experiencing distress could access appropriate supports.

Participants were invited to return (via email or telephone call) for the Time 2 evaluation, in the second, third, and fourth week of classes of the winter term (i.e., after the winter holidays), approximately 4 months later, and after participants had received back their grades for the midterm examination. A numeric coding system was used to maintain anonymity while retaining the ability to link Time 1 and Time 2 data. Participants were reminded about the details of the study and issues of consent and then asked to complete the same measures they completed during the Time 1 evaluation (excluding the demographic questionnaire). Upon completion of the session, participants were given a debriefing form outlining the purpose of the study. Participants received course credit or were paid $10 for each session in which they participated.

Chapter 4

Results

Descriptives

A total of 503 participants provided complete Time 1 data. Of these participants, 301 students returned to provide complete Time 2 data. Thus the response rate was 59.8% of students who completed the first session. The 301 completers and 202 noncompleters were compared with regard to age and Time 1 scores on measures of perfectionism, stress, and symptoms using independent samples t-tests. The distribution of gender and ethnicity[2] of the two groups was compared using chi-square tests. There was a significant difference in Time 1 AD scores, $t = 2.87$, $p = .004$, with noncompleters scoring higher on this measure than completers, $M = 58.15$, $SD = 15.65$ and $M = 54.40$, $SD = 13.43$, respectively. No other significant differences between the completers and noncompleters were observed.

Potential relationships among demographic variables (i.e., age, gender, and ethnicity) and measures of perfectionism, stress, and symptoms were examined in the group of completers (N = 301). A series of bivariate correlations revealed no significant relationships between age and any of the other variables of interest. A series of independent samples t-tests revealed that there were significant differences in symptom scores across gender. More specifically, women reported significantly higher Time 1 and

[2] The ethnicity variable was simplified to reflect two groups. The first group was comprised of students self-reporting as White. The second group was comprised of all other students (i.e., mostly those self-reporting as Asian).

2 general distress (GD)[3] scores than men (see Table 1). A series of independent samples t-tests revealed that there were significant differences in perfectionism, stress, and symptom scores across ethnicity (see Table 2). More specifically, the group comprised of students from an Asian/Other ethnicity scored significantly higher than White students on most measures of perfectionism. There were also significant differences in LEQ total number of events and LEQ interpersonal events scores across ethnicity, with White students scoring significantly higher than students of Asian/Other ethnicity on both measures. Finally, students of Asian/Other ethnicity scored significantly higher than White students on both Time 1 and 2 AD scores.

Table 1

Gender Differences Across Symptom Measures

	Men (N = 78 for T1, N = 42 for T2)		Female (N = 425 for T1, N = 259 for T2)		
	Mean	*SD*	Mean	*SD*	*t*
GD-T1	76.22	19.99	85.88	26.53	3.71***
AD-T1	53.10	12.52	56.42	14.75	1.87
AA-T1	25.14	7.80	26.74	9.49	1.61
GD-T2	69.50	21.67	82.01	24.95	3.39**
AD-T2	56.17	13.77	57.29	14.18	0.48
AA-T2	23.55	6.95	25.06	8.38	1.11

Note. GD-T1 = General Distress – Time 1; AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; GD-T2 = General Distress – Time 2; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2.

* $p < .05$, ** $p < .01$, *** $p < .001$

[3] GD represents the sum of the 3 general distress indices of the MASQ. This variable was used in all subsequent analyses as the measure of general distress.

Table 2

Ethnic Differences Across Perfectionism, Stress, and Symptom Measures

	White (N = 335 for T1, N = 210 for T2)		Asian/Other (N = 168 for T1, N = 91 for T2)		
	Mean	*SD*	Mean	*SD*	*t*
SOP	72.42	14.88	76.14	15.42	2.61**
SPP	52.01	13.54	54.95	11.91	2.39*
OOP	55.57	10.79	57.90	11.29	2.26*
CM	23.04	6.43	25.76	6.60	4.42***
PS	25.75	4.46	26.40	5.02	1.48
PE	14.87	3.73	16.69	4.48	4.52***
PC	7.91	3.07	9.85	3.53	6.05***
DA	11.51	3.23	12.52	3.24	3.33**
O	23.96	4.48	24.38	4.01	1.00
LEQ-Total	6.63	3.31	5.61	3.90	2.32*
LEQ-INT	4.58	2.83	3.46	3.01	3.07**
LEQ-ACH	1.02	0.88	1.23	1.12	1.56
GD-T1	84.03	24.54	85.08	28.32	0.43
AD-T1	54.12	14.34	59.48	14.09	3.97***
AA-T1	26.47	9.21	26.56	9.40	0.11
GD-T2	79.16	23.57	82.81	27.60	1.17
AD-T2	55.43	13.69	61.05	14.34	3.23**
AA-T2	24.59	8.03	25.47	8.60	0.86

Note. SOP = Self-Oriented Perfectionism; SPP = Socially-Prescribed Perfectionism; OOP = Other-Oriented Perfectionism; CM = Concern Over Mistakes; PS = Personal Standards; PE = Parental Expectations; PC = Parental Criticism; DA = Doubts About Actions; O = Organization; LEQ-Total = Total number of stressful life events; LEQ-INT = Total number of stressful interpersonally-related stressful life events; LEQ-ACH = Total number of achievement-related stressful life events; GD-T1 = General Distress – Time 1; AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; GD-T2 = General Distress – Time 2; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2.

* $p < .05$, ** $p < .01$, *** $p < .001$

To test for the possible influence of ethnicity and gender in perfectionistic stress enhancement, stress generation, and diathesis-stress models, ethnicity was entered as a

covariate in all subsequent analyses and gender was entered as a covariate in analyses involving GD scores. In all analyses, the inclusion of ethnicity and gender did not significantly alter findings related to the goals of this investigation. Thus, for ease of interpretation and simplicity, the uncontrolled analyses are presented. Means and standard deviations for the study measures are presented in Table 3, and correlations among the study measures are presented in Tables 4, 5, 6, and 7.

Observed correlations were in the expected direction. Among the dimensions of perfectionism from the MPS-HF and MPS-Frost, the strongest correlations were observed between SOP and PS, SPP and CM, SPP and PE, and SPP and PC. These relationships are consistent both with theory and previous psychometric investigations (e.g., Frost et al., 1993). Among the symptom measures, the correlations between Time 1 and the corresponding Time 2 measures were large, suggesting the stability of symptoms over the 4-month interval.

The majority of dimensions of perfectionism measured at Time 1 were significantly positively correlated with symptom measures (Time 1 and 2). The exceptions were PS, which was related to all symptom scales except anhedonic depression (both Time 1 and 2); O, which was not related to any of the symptom measures; and OOP, which was not related to general distress (both Time 1 and 2) and anxious arousal (Time 1). Some of the perfectionism dimensions were significantly positively correlated with the number of stressful life events endorsed on the LEQ. PC was related to total number of overall events, total number of interpersonal events, and total number of achievement events. SPP and PE were related to total number of overall

Table 3

Means and Standard Deviations for Perfectionism, Stress, and Symptom Measures

	N	Mean	*SD*
SOP	503	73.66	15.15
SPP	503	52.10	13.08
OOP	503	56.35	11.00
CM	503	23.94	6.61
PS	503	25.97	4.66
PE	503	15.48	4.09
PC	503	8.56	3.36
DA	503	11.85	3.26
O	503	24.10	4.33
LEQ-Total	301	6.33	3.53
LEQ-INT	301	4.24	2.93
LEQ-ACH	301	1.08	0.96
GD-T1	503	84.38	25.84
AD-T1	503	55.91	14.47
AA-T1	503	26.50	9.26
GD-T2	301	80.26	24.87
AD-T2	301	57.12	14.10
AA-T2	301	24.85	8.20

Note. SOP = Self-Oriented Perfectionism; SPP = Socially-Prescribed Perfectionism; OOP = Other-Oriented Perfectionism; CM = Concern Over Mistakes; PS = Personal Standards; PE = Parental Expectations; PC = Parental Criticism; DA = Doubts About Actions; O = Organization; LEQ-Total = Total number of stressful life events; LEQ-INT = Total number of stressful interpersonally-related stressful life events; LEQ-ACH = Total number of achievement-related stressful life events; GD-T1 = General Distress – Time 1; AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; GD-T2 = General Distress – Time 2; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2.

Table 4

Correlations for Perfectionism Dimensions (N = 503)

	SOP	SPP	OOP	CM	PS	PE	PC	DA
SOP								
SPP	.52***							
OOP	.31***	.31***						
CM	.57***	.67***	.27***					
PS	.77***	.37***	.24***	.46***				
PE	.36***	.61***	.26***	.37***	.30***			
PC	.21***	.57***	.12**	.42***	.12**	.65***		
DA	.39***	.40***	.11*	.46***	.22***	.12**	.23***	
O	.38***	.08	.15**	.06	.34***	.06	.04	.11*

Note. SOP = Self-Oriented Perfectionism; SPP = Socially-Prescribed Perfectionism; OOP = Other-Oriented Perfectionism; CM = Concern Over Mistakes; PS = Personal Standards; PE = Parental Expectations; PC = Parental Criticism; DA = Doubts About Actions; O = Organization.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Correlations for Symptom Measures (Time 1 and 2)

	GD-T1	AD-T1	AA-T1	GD-T2	AD-T2	AA-T2
GD-T1						
AD-T1	.61***					
AA-T1	.69***	.33***				
GD-T2	.68***	.38***	.44***			
AD-T2	.36***	.55***	.17***	.61***		
AA-T2	.53***	.25***	.55***	.68***	.30***	

Note. Correlations involving only Time 1 measures ($N = 503$). Correlations involving Time 2 measures ($N = 301$). GD-T1 = General Distress – Time 1; AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; GD-T2 = General Distress – Time 2; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

Correlations for Perfectionism, Stress, and Symptom Measures

	SOP	SPP	OOP	CM	PS	PE	PC	DA	O
LEQ-Total	.01	.15*	-.01	.05	.01	.21***	.25***	.09	.04
LEQ-INT	.02	.15**	-.01	.03	.04	.22***	.23***	.04	.06
LEQ-ACH	-.04	.06	.02	.08	-.04	.10	.19**	.13*	.02
GD-T1	.28***	.41***	.10*	.44***	.20***	.15**	.29***	.48***	.07
AD-T1	.16***	.35***	.12***	.39***	.03	.10*	.26***	.39***	.01
AA-T1	.22***	.30***	.04	.29***	.17***	.15**	.23***	.31***	.08
GD-T2	.27***	.46***	.13*	.48***	.18**	.29***	.36***	.40***	.04
AD-T2	.14*	.33***	.15**	.38***	.03	.16**	.27***	.33***	-.04
AA-T2	.19**	.35***	.13*	.30***	.15**	.21***	.28***	.23***	.03

Note. Correlations involving only Time 1 measures ($N = 503$). Correlations involving Time 2 measures ($N = 301$ LEQ-Total = Total number of stressful life events; LEQ-INT = Total number of stressful interpersonally-related stressful life events; LEQ-ACH = Total number of achievement-related stressful life events; GD-T1 = General Distress – Time 1; AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; GD-T2 = General Distress – Time 2; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

Correlations for Stress and Symptom Measures (N = 301)

	LEQ-Total	LEQ-INT	LEQ-ACH
GD-T1	.28**	.23**	.23**
AD-T1	.03	-.01	.15**
AA-T1	.22**	.19**	.12**
GD-T2	.34**	.28**	.27**
AD-T2	.10	.05	.20**
AA-T2	.24**	.21**	.11*

Note. LEQ-Total = Total number of stressful life events; LEQ-INT = Total number of stressful interpersonally-related stressful life events; LEQ-ACH = Total number of achievement-related stressful life events; GD-T1 = General Distress – Time 1; AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; GD-T2 = General Distress – Time 2; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2.
* $p < .05$, ** $p < .01$, *** $p < .001$

events and total number of interpersonal events, and DA was related to number of achievement events. Finally, all symptom measures (Time 1 and 2) were positively correlated with all stress measures from the LEQ, expect anhedonic depression, which was only related to number of stressful achievement events.

Dimensions of Perfectionism

This investigation examined two separate but related conceptualizations of perfectionism. First, the interpersonal dimensions of SOP and SPP from the MPS-HF were examined, mostly in the context of the perfectionism specific vulnerability hypothesis. That is, it was expected that SOP and SPP would predict greater stress enhancement and generation when paired with a relevant and congruent stressor (i.e., SPP and achievement stress pairing, SOP and interpersonal stress pairing).

Second, adaptive and maladaptive dimensions of perfectionism were examined. It was predicted that maladaptive perfectionism would be related to greater stress enhancement and generation, replicating past research. Adaptive perfectionism was also examined to clarify whether this "healthy" form of perfection was indeed related to positive or adaptive outcomes. Most previous investigations examining this adaptive-maladaptive typology have adopted the two factors first identified by Frost et al. (1993), and later replicated by Bieling et al. (2004). That is, the adaptive dimension (i.e., positive striving) is comprised of the sum of the z-scores for SOP, OOP, PS, and O, and the maladaptive dimension (i.e., maladaptive evaluative concerns) is comprised of the sum of the z-scores for SPP, CM, PE, PC, and DA. A factor analysis was conducted to ensure that the perfectionism data collected in the current study exhibited a similar factor

structure as previous investigations, and that our adaptive and maladaptive perfectionism dimensions were psychometrically valid. To be consistent with Frost et al. (1993) and Bieling et al. (2004) the 9 subscales of the MPS-HF and MPS-Frost served as variables in the analysis. Principal components analysis was used as the method of factor extraction (i.e., Varimax rotation) and the Kaiser criterion was used for initial factor extraction (i.e., eigenvalues > 1.00). The analysis yielded a two-factor solution that accounted for 58% of the total variance among the subscales. Factor loadings for the rotated matrix are displayed in Table 8. Consistent with previous research, one of the factors consisted of stronger loadings for SPP, CM, PE, and PC. This factor represents maladaptive perfectionism. The other factor consisted of stronger loadings for SOP, OOP, PS, and O. This factor is representative of adaptive perfectionism. Frost et al. (1993) reported that DA was part of the maladaptive perfectionism factor, but in the current study the factor loading for DA was not as clearly loaded on this factor. Thus, in this investigation, DA was not included in calculating the maladaptive perfectionism dimension (MAL-P) but SPP, CM, PE, and PA were included. The adaptive perfectionism dimension (ADAP-P) was comprised, as in previous investigations, of SOP, OOP, PS, and O. The bivariate correlation between MAL-P and ADAP-P was $r(503) = .44$, $p = .000$.

Table 8

Factor Loadings for Perfectionism Subscales from the MPS-HF and MPS-Frost (N = 503)

	Factor 1	Factor 2
SOP	.331	**.847**
SPP	**.824**	.313
OOP	.262	**.377**
CM	**.654**	.451
PS	.189	**.823**
PE	**.798**	.101
PC	**.844**	-.070
DA	.369	.379
O	-.166	**.657**

Note. SOP = Self-Oriented Perfectionism; SPP = Socially-Prescribed Perfectionism; OOP = Other-Oriented Perfectionism; CM = Concern Over Mistakes; PS = Personal Standards; PE = Parental Expectations; PC = Parental Criticism; DA = Doubts About Actions; O = Organization.

Stress Enhancement Hypotheses

The stress enhancement hypothesis predicts that individuals high in perfectionism have a tendency to appraise negative events as more stressful than individuals low in perfectionism. Thus, in examining stress enhancement, one is interested in how the individual *reacts* to a given stressful event. In order to appropriately examine this stress enhancement process, both measures of objective and subjective stress related to a negative event are necessary. Without ensuring that an event is objectively stressful, it is difficult to know whether the perceived stress is in relation to the event or based on the fact that the person's diathesis itself results in the interpretation of minor events as very significant. Without an adequate measure of the level of objective stress, one cannot rule out the possibility that the diathesis essentially overrides environmental input, making

external stress factors negligible (Monroe & Simons, 1991). Thus, for the following analyses, I focused only on those participants who had an objectively stressful event (as determined by the LEDS coding system). To test the proposed process of perfectionistic stress enhancement, this investigation examined two specific stressful life events – an achievement related event (i.e., poor performance on an exam) and an interpersonal event (i.e., break up of a romantic relationship). These events were considered separately.

Achievement Event

All 301 participants with complete Time 1 and 2 data were assigned objective short-term and long-term threat ratings for the achievement event based on the LEDS procedure defined above. For the short-term threat ratings, 82 participants were assigned a rating of 2 (i.e., Moderate), 73 participants were assigned a rating of 3 (i.e., Some), and 146 participants were assigned a rating of 4 (i.e., Little/None). For the long-term threat ratings, 11 participants were assigned a rating of 2 (i.e., Moderate), 39 participants were assigned a rating of 3 (i.e., Some), and 251 participants were assigned a rating of 4 (i.e., Little/None). Analyses were focused on short-term threat ratings because more participants experienced an event of at least some threat. Only participants whose event received a short-term threat rating of 2 or 3 were selected for analyses exploring the stress enhancement process (i.e., this group of participants experienced an achievement event that was objectively rated as comprising at least some threat).

Before beginning analyses examining the stress enhancement process (i.e., potential relationship between perfectionism and *appraised stress*), I examined whether perfectionism was significantly associated with the experience of *objective stress*, that is,

whether higher perfectionism scores were related to a greater likelihood for experiencing an objectively more stressful event. This analysis was important for ruling out the possibility that if a relationship between perfectionism and appraised stress was indeed found, that it was not accounted for by a relationship between perfectionism and level of objective stress. A series of correlations were conducted looking at the relationships between a particular perfectionism dimension (SOP, SPP, ADAP-P and MAL-P) and short-term threat ratings for the achievement event. No significant correlations were observed (all p values > .35). Thus, perfectionism was not related to the experience of an objectively more stressful achievement event.

Basic stress enhancement hypothesis. The first main goal was to examine whether perfectionism was indeed related to stress enhancement. Bivariate correlations were computed in order to determine whether perfectionism dimensions were associated with greater stress appraisals for those who had experienced an objectively stressful achievement event. Both adaptive and maladaptive perfectionism dimensions were significantly correlated with appraised achievement stress, $r(155) = .33$, $p < .001$ and $r(155) = .24$, $p < .01$, respectively.

Next, a regression analysis was conducted with level of appraised stress for the exam event as the dependent variable. A measure of general negative affect or distress (i.e., GD variable from Time 1) was entered as a covariate in Block 1 to control for the potential confounding effect of negative affect concurrent with the personality diathesis. That is, I wanted to control for a potential diathetic bias – the relationship between perfectionism and stress may be accounted for by general negative affect associated with

having a perfectionistic personality style and not perfectionism per se. Both perfectionism measures (i.e., MAL-P and ADAP-P) were entered together as predictors in Block 2. This regression revealed that only ADAP-P was a significant predictor of appraised stress for the achievement event, $\beta = .25$, $t(152) = 2.86$, $p = .005$. Thus, contrary to past research suggesting ADAP-P as a healthy form of perfectionism and associated with positive outcomes, in this study ADAP-P was related to higher levels of appraised stress for the achievement event, even after controlling for the effects of MAL-P and general distress.

Specific vulnerability hypothesis and stress enhancement. Another goal was to test the perfectionism specific vulnerability hypothesis as it related to stress enhancement. That is, it was predicted that SOP would be preferentially related to greater appraised stress for the achievement event. This hypothesis is based on the idea that individuals high in SOP are achievement-focused, and, thus, failure to meet achievement-related goals would be considered a blow to the individual's ego and sense of self, making such an event very stressful.

First, bivariate correlations showed that both SOP and SPP were significantly associated with greater appraised achievement stress for those who had objectively experienced a stressful achievement event, $r(155) = .33$, $p < .001$ and $r(155) = .22$, $p < .01$, respectively. Then, a regression analysis was conducted with appraised stress for the achievement event as the dependent variable. General distress was entered as a covariate in Block 1, and SOP and SPP were entered together as predictors in Block 2. Consistent

with hypotheses, this analysis found that only SOP significantly predicted appraised stress, $\beta = .29$, $t(151) = 3.14$, $p = < .002$. Thus, SOP is a unique predictor of appraised stress for the achievement event, providing evidence for both the stress enhancement process and the perfectionism specific vulnerability hypothesis.

Testing diathesis-stress models in the prediction of symptoms. Finally, a major goal of this study was to examine the process of stress enhancement within a diathesis-stress framework to predict specific symptoms of anhedonic depression (AD) and anxious arousal (AA). A series of hierarchical multiple regression analyses were conducted. In each analysis, the dependent variable was either T2 AD or AA scores. The corresponding Time 1 symptom measure was always entered as a control in Block 1. A specific perfectionism dimension was entered in Block 2, appraised achievement stress was entered in Block 3, and the interaction term was entered in Block 4[4].

First, regression analyses were conducted examining the adaptive perfectionism dimension[5]. The results of these regressions are presented in Table 9. Not surprisingly, the Time 1 symptom measure was the strongest predictor of the Time 2 symptom measure. Adaptive perfectionism was not a significant main effect predictor of either AD or AA symptoms. Appraised achievement stress was a significant main effect predictor of AD symptoms, but not AA symptoms. The interaction term did not significantly

[4] Centered predictor variables were used in all hierarchical regression analyses exploring the prediction of symptoms (see Aiken & West, 1991; Frazier, Tix, & Barron, 2004).

[5] Given the more global nature of these perfectionism dimensions, a more global measure of appraised stress would have been optimal. However, this study assessed for two specific stressful events (i.e., the interpersonal and achievement events) and combining these stress appraisals was not appropriate. Thus, interactions between these more global perfectionism constructs and stress appraisals for the specific events were examined.

Table 9

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Adaptive Perfectionism and Appraised Stress for the Achievement Event (N = 155)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.25	
AD-T1	0.54	0.08		7.10***
Step 2			.01	
AD-T1	0.52	0.08		6.75***
ADAP-P	0.43	0.34		1.28
Step 3			.02	
AD-T1	0.49	0.08		6.32***
ADAP-P	0.22	0.35		0.65
ACH-Stress	2.20	1.10		2.00*
Step 4			.00	
AD-T1	0.49	0.08		6.14***
ADAP-P	0.21	0.35		0.60
ACH-Stress	2.29	1.16		1.99*
ADAP-P X ACH-Stress	0.10	0.38		0.27
DV = AA-T2				
Step 1			.32	
AA-T1	0.48	0.06		8.42***
Step 2			.02	
AA-T1	0.47	0.06		8.16***
ADAP-P	0.34	0.18		1.89
Step 3			.00	
AA-T1	0.47	0.06		8.10***
ADAP-P	0.36	0.19		1.90
ACH-Stress	-0.21	0.61		-0.35
Step 4			.03	
AA-T1	0.47	0.06		8.12***
ADAP-P	0.29	0.19		1.51
ACH-Stress	0.20	0.62		0.32
ADAP-P X ACH-Stress	0.48	0.20		2.37*

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; ADAP-P = Adaptive Perfectionism; ACH-Stress = Appraised stress for the achievement event.

* $p < .05$, ** $p < .01$, *** $p < .001$

predict AD. However, this interaction did significantly predict the Time 2 measure of AA.

This significant interaction was further evaluated using the approach of Aiken and West (1991). This approach involves calculating simple slopes, in this case, the slopes of the regression lines of anxious arousal on appraised stress at particular values of adaptive perfectionism. The values of adaptive perfectionism that were used were: (1) 1 standard deviation above its own mean (i.e., high adaptive perfectionism), and (2) 1 standard deviation below its own mean (i.e., low adaptive perfectionism) (see Cohen & Cohen, 1983)[6]. Then for each simple regression line, t-tests determined if the slopes of the lines were significantly different from zero. In addition, a t-test determined whether the slopes of the lines were significantly different from each other.

See Figure 1 for a graphical representation of this interaction[7]. The slopes of both simple regression lines were not significantly different from zero (using two-tailed test and $\alpha = .05$). However, the slopes of the two simple regression lines were significantly different from one another. This interaction indicates that as stress appraisals for the achievement event increased, there was a difference in the level of anxious arousal experienced by those with low adaptive perfectionism as compared to those with high adaptive perfectionism. At low levels of appraised achievement stress there was no difference in anxious arousal,

[6] Simple slopes were also calculated for a value equal to the mean in this analysis and in all subsequent simple slopes analyses. However, the slope of the mean regression line was never significantly different from zero and its inclusion did not contribute to the understanding of the interaction pattern. Thus, these lines are not discussed.

[7] All graphs depicting significant interactions were created by plotting scores for participants representing the four combinations of low and high scores (i.e., 1 SD below and 1 SD above) on the two predictor variables that contributed to the interaction (see Frazier et al., 2004).

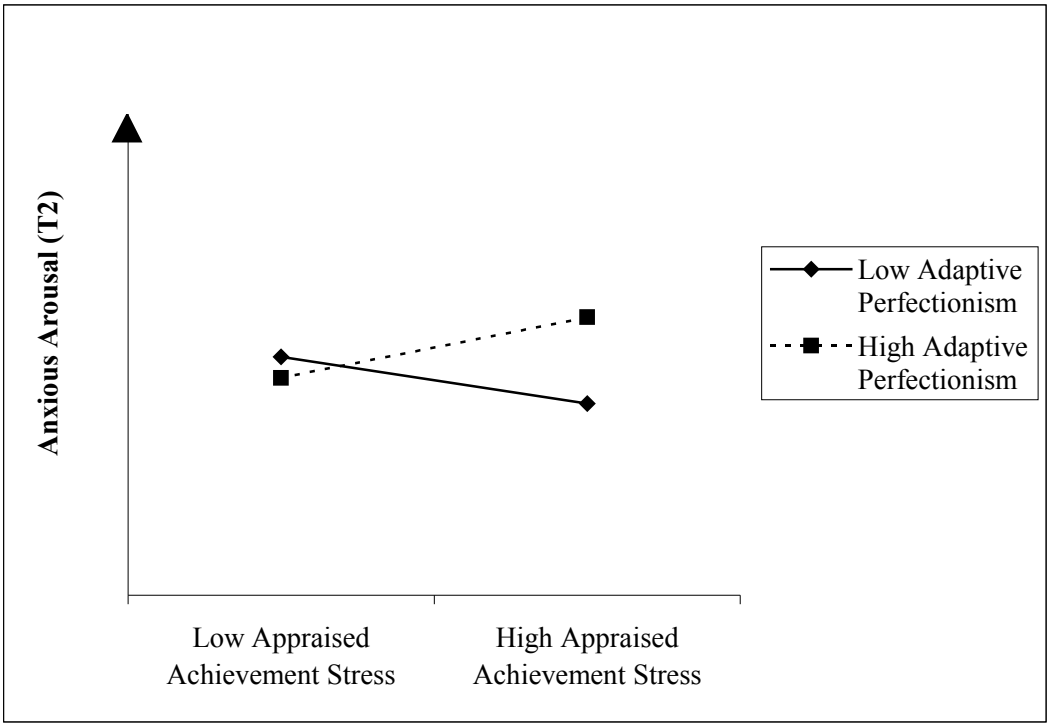

Figure 1. Significant interaction between adaptive perfectionism and appraised achievement stress predicting symptoms of anxious arousal.

regardless of level of adaptive perfectionism. However, as appraised achievement stress increased, those high in adaptive perfectionism experienced more anxious arousal compared to those low in adaptive perfectionism. This suggests that adaptive perfectionism may pose a risk factor for emotional maladjustment in the face of stress.

Next, regression analyses were conducted examining the maladaptive perfectionism dimension, appraised achievement stress, and their interaction in predicting symptoms. The results of these hierarchical regressions are presented in Table 10.

Table 10

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Maladaptive Perfectionism and Appraised Stress for the Achievement Event (N = 155)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.25	
AD-T1	0.54	0.08		7.10***
Step 2			.06	
AD-T1	0.47	0.08		6.13***
MAL-P	1.05	0.30		3.45**
Step 3			.01	
AD-T1	0.44	0.08		5.75***
MAL-P	0.95	0.31		3.10**
ACH-Stress	1.82	1.04		1.75
Step 4			.00	
AD-T1	0.44	0.08		5.76***
MAL-P	0.91	0.32		2.86**
ACH-Stress	1.84	1.04		1.76
MAL-P X ACH-Stress	0.17	0.33		0.51
DV = AA-T2				
Step 1			.32	
AA-T1	0.48	0.06		8.42***
Step 2			.03	
AA-T1	0.44	0.06		7.59***
MAL-P	0.47	0.17		2.77**
Step 3			.00	
AA-T1	0.44	0.06		7.55***
MAL-P	0.48	0.17		2.77**
ACH-Stress	-0.18	0.58		-0.30
Step 4			.02	
AA-T1	0.43	0.06		7.32***
MAL-P	0.41	0.18		2.31*
ACH-Stress	-0.11	0.58		-0.19
MAL-P X ACH-Stress	0.38	0.18		2.04*

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; MAL-P = Maladaptive Perfectionism; ACH-Stress = Appraised stress for the achievement event.

* $p < .05$, ** $p < .01$, *** $p < .001$

Again, the Time 1 symptom measure was the strongest predictor of the Time 2 symptom measure. Maladaptive perfectionism predicted both symptoms measures as a main effect.

That is, individuals endorsing higher levels of maladaptive perfectionism were also likely to endorse higher levels of AD and AA. The interaction between maladaptive perfectionism and appraised achievement stress did not significantly predict AD. However, this interaction did significantly predict the Time 2 measure of AA.

Again, this interaction was examined using the same simple slopes procedure described above. See Figure 2 for a graphical representation of this interaction. The slopes of both simple regression lines were not significantly different from zero. However, the slopes of the two simple regression lines were significantly different from one another. This interaction indicates that as stress appraisals for the achievement event increased, there was a difference in the level of anxious arousal experienced by those with low maladaptive perfectionism as compared to those with high maladaptive perfectionism. At low levels of appraised achievement stress there was no difference in anxious arousal, regardless of level of maladaptive perfectionism. However, as appraised achievement stress increased, those high in maladaptive perfectionism experienced more anxious arousal compared to those low in maladaptive perfectionism. This effect essentially mirrors the above finding between adaptive perfectionism and appraised achievement stress.

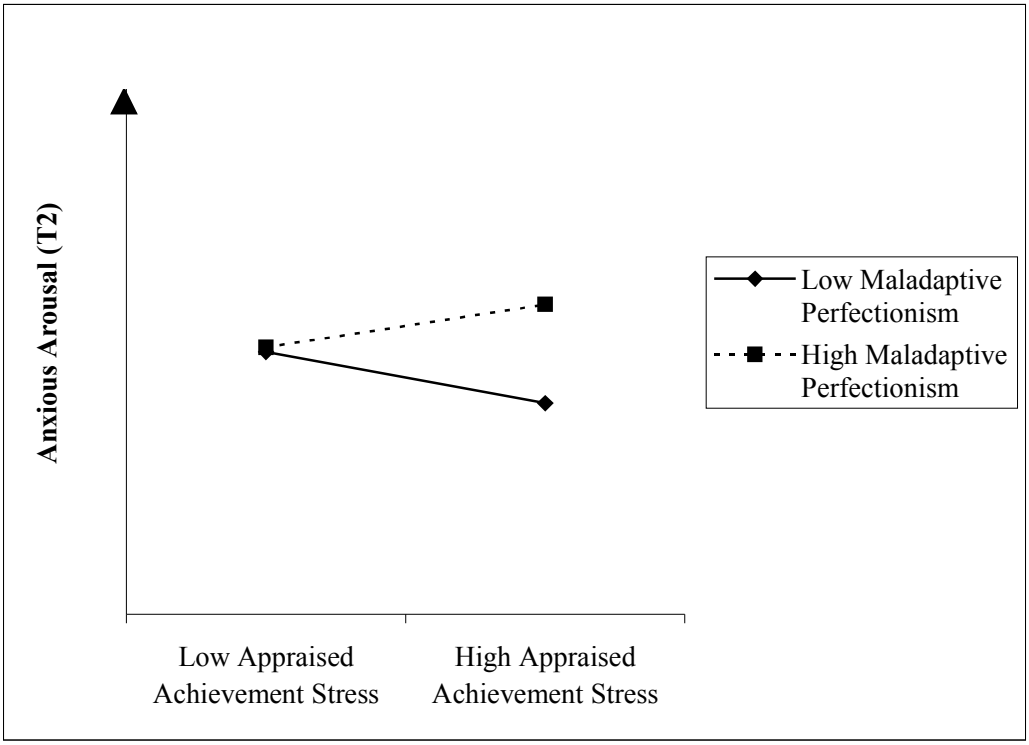

Figure 2. Significant interaction between maladaptive perfectionism and appraised achievement stress predicting symptoms of anxious arousal.

Given the specific nature of the stressful event under examination (i.e., in the achievement domain), the specific vulnerability hypothesis was also tested. That is, specifically SOP was predicted to interact with appraised achievement stress to predict symptoms. The results of these hierarchical regressions are presented in Table 11. Again, the Time 1 symptom measure was the strongest predictor of the Time 2 symptom measure. Neither SOP nor appraised stress predicted symptoms as a main effect. The interaction between SOP and appraised stress did not significantly predict AD

Table 11

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Self-Oriented Perfectionism and Appraised Stress for the Achievement Event (N = 155)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.25	
AD-T1	0.54	0.08		7.10***
Step 2			.01	
AD-T1	0.52	0.08		6.73***
SOP	0.10	0.06		1.55
Step 3			.02	
AD-T1	0.49	0.08		6.31***
SOP	0.06	0.07		0.91
ACH-Stress	2.10	1.10		1.91
Step 4			.00	
AD-T1	0.49	0.08		6.27***
SOP	0.06	0.07		0.90
ACH-Stress	2.08	1.15		1.81
SOP X ACH-Stress	-0.01	0.08		-0.07
DV = AA-T2				
Step 1			.32	
AA-T1	0.48	0.06		8.42***
Step 2			.02	
AA-T1	0.46	0.06		7.96***
SOP	0.07	0.04		1.88
Step 3			.00	
AA-T1	0.46	0.06		7.92***
SOP	0.07	0.04		1.89
ACH-Stress	-0.21	0.61		-0.34
Step 4			.03	
AA-T1	0.46	0.06		7.90***
SOP	0.05	0.04		1.39
ACH-Stress	0.20	0.62		0.33
SOP X ACH-Stress	0.10	0.04		2.39*

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; SOP = Self-Oriented Perfectionism; ACH-Stress = Appraised stress for the achievement event.

* $p < .05$, ** $p < .01$, *** $p < .001$

However, interestingly, this interaction did significantly predict the Time 2 measure of AA.

This interaction was further evaluated using the simple slopes analysis. For low SOP, the slope of the simple regression line was not significantly different from zero. However, for high SOP, the slope of the simple regression line was positive and significantly different from one another. See Figure 3 for a graphical representation.

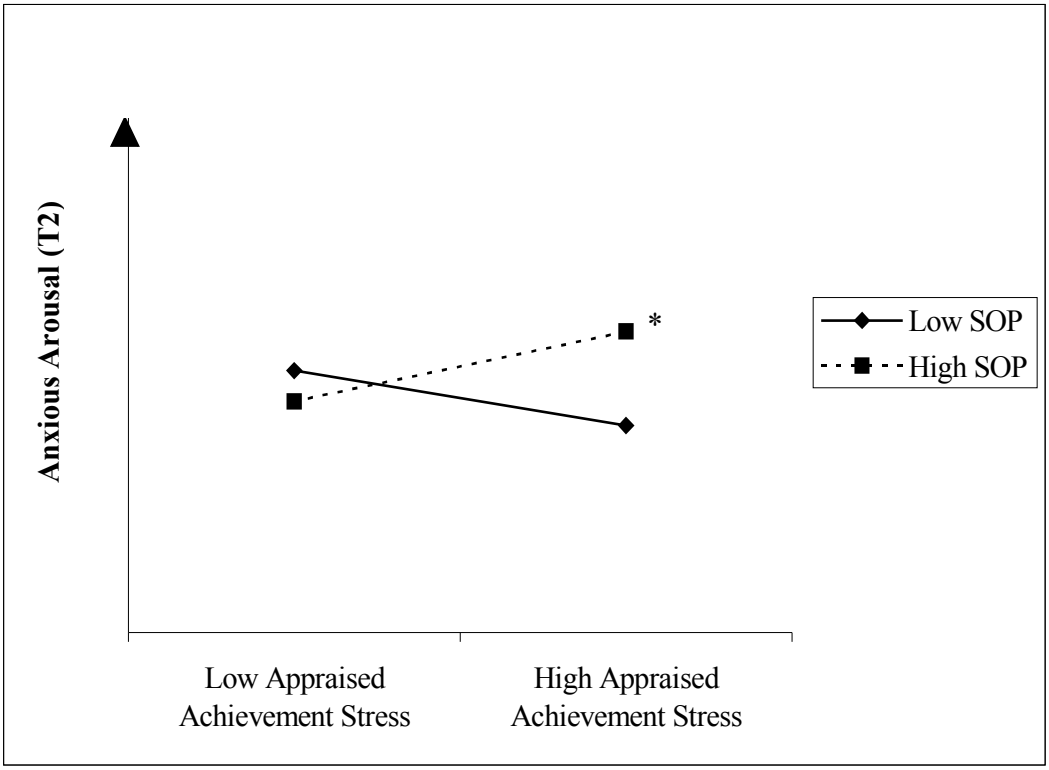

Figure 3. Significant interaction between Self-Oriented Perfectionism and appraised achievement stress predicting symptoms of anxious arousal.

* Slope significantly different from zero, $t(151) = 1.99$, $p < .05$

This interaction indicates that individuals who endorse high levels of SOP and also reported high levels of appraised achievement stress were the most likely to experience the highest levels of anxious arousal. Thus, SOP seems to act as a vulnerability factor, interacting with the theoretically matched appraised achievement stress to significantly predict anxious arousal symptoms.

To fully test the specific vulnerability hypothesis, another series of hierarchical regressions were run using SPP as the measure of perfectionism entered in Block 2. These analyses were run as a control. That is, given that the appraised stress was related to an achievement event, the perfectionism dimension of SPP would not be expected to interact with this measure of stress to predict symptoms. Indeed, this interaction term did not significantly predict either of the specific Time 2 symptom measures (both p values > .50).

Interpersonal Event

Participants were asked to complete the questionnaire assessing for the interpersonal event (i.e., break up of a romantic relationship in the last 4 months) at both the Time 1 and 2 evaluations. Of the 503 participants who participated in the first session, 124 reported experiencing a relationship termination some time in the 4 months prior to that session. Of the 301 participants who also participated in the second session, 56 reported having experienced a relationship termination in the 4-month interval between the Time 1 and 2 evaluations. Given the nature of the analyses required to test a diathesis-stress model (i.e., hierarchical regressions), and concerns about having enough power to detect effects, I focused my examination of the stress enhancement process on

the interpersonal event data collected at the Time 1 evaluation. That is, the interpersonal events under examination occurred prior to the first session. Thus, unfortunately, the analyses examining the stress enhancement process for the interpersonal event were not based on longitudinal data. The specific diathesis-stress models examined below involved the prediction of concurrent symptom scores (i.e., perfectionism, stress, and symptoms measures were all from the Time 1 evaluation).

Each of the 124 participants reporting a relationship termination prior to session 1 was assigned a short- and long-term threat rating for the event. In terms of short-term threat, 19 participants were assigned a rating of 1 (i.e., Marked), 43 were assigned a rating of 2 (i.e., Moderate), and 61 were assigned a rating of 3 (i.e., Some). In terms of long-term threat, 12 participants were assigned a rating of 2 (i.e., Moderate), 49 were assigned a rating of 3 (i.e., Some), and 63 were assigned a rating of 4 (i.e., Little/None). Again, analyses were focused on the short-term threat ratings because many more individuals had an event of at least some threat. Also, for the same reason explained above for the achievement event, only participants with an objectively stressful event (i.e., short-term threat rating of 1, 2 or 3) were targeted for analyses.

Again, before examining the stress enhancement process for the interpersonal event (i.e., potential relationship between perfectionism and *appraised stress*), we examined whether perfectionism was significantly associated with the experience of *objective stress*. A series of correlations were conducted looking at the relationships between a particular perfectionism dimension (SOP, SPP, ADAP-P and MAL-P) and short-term threat ratings for the interpersonal event. No significant correlations were

observed (all *p* values > .12). Thus, perfectionism was not related to the experience of an objectively more stressful interpersonal event.

Basic stress enhancement hypothesis. The first goal was to examine whether perfectionism was indeed related to stress enhancement. Bivariate correlations were computed between perfectionism dimensions (i.e., adaptive and maladaptive perfectionism) and appraised stress for the interpersonal event. Contrary to the stress enhancement hypothesis, neither adaptive nor maladaptive perfectionism were significantly associated with greater appraised interpersonal stress.

Specific vulnerability hypothesis and stress enhancement. The second goal was to test the perfectionism specific vulnerability hypothesis as it related to stress enhancement for the interpersonal event. That is, it was expected that SPP, and not SOP, would be preferentially related to greater levels of appraised interpersonal stress. This hypothesis is based on the idea that individuals high in SPP strive for perfection because of a high need for approval from others and a fear of negative evaluation from others, thus their perfectionistic motivations are externally motivated. Thus, individuals high in SPP may be likely to find interpersonally stressful life events particularly distressing.

First, bivariate correlations were computed between perfectionism dimensions (i.e., SOP and SPP) and appraised stress for the interpersonal event. Only SPP was significantly correlated with level of appraised interpersonal stress, $r(123) = .21$, $p = .02$. Next, a regression analysis was conducted with level of appraised stress for the interpersonal event as the dependent variable. General distress was entered as a covariate

in Block 1 and SPP was entered as a predictor in Block 2. This analysis found that only general distress was a significant predictor of appraised stress for the interpersonal event, $\beta = .21$, $t(120) = 2.18$, $p = .03$. Thus, the original finding that SPP was associated with a greater appraised interpersonal stress seems to have been accounted for by the effects of concurrent general negative affect.

Testing diathesis-stress models in the prediction of symptoms. The third goal was to examine the stress enhancement process within a diathesis-stress model to predict specific symptoms of AD and AA. A series of hierarchical multiple regression analyses were conducted. In each analysis, the dependent variable was a specific Time 1 symptom measure[8]. A specific perfectionism dimension was entered in Block 1, appraised interpersonal stress was entered in Block 2, and the interaction term was entered in Block 4.

First, regression analyses were conducted examining the adaptive perfectionism dimension. The results of these regressions are presented in Table 12. Adaptive perfectionism did not significantly predict either AD or AA. Appraised interpersonal stress did significantly predict anxious arousal symptoms in the full model. Finally, the interaction between adaptive perfectionism and appraised interpersonal stress did not significantly predict either of the symptom measures.

[8] These analyses were on data collected at the Time 1 evaluation – i.e., these models were predicting concurrent symptoms.

Table 12

Hierarchical Regression Analyses Predicting Time 1 Symptom Scores With Adaptive Perfectionism and Appraised Stress for the Interpersonal Event (N = 123)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T1				
Step 1			.00	
ADAP-P	0.34	0.48		0.70
Step 2			.04	
ADAP-P	0.34	0.48		0.72
INT-Stress	2.41	1.09		2.20*
Step 3			.02	
ADAP-P	0.50	0.48		1.05
INT-Stress	2.11	1.10		1.91
ADAP-P X INT-Stress	-0.63	0.40		-1.57
DV = AA-T1				
Step 1			.02	
ADAP-P	0.44	0.29		1.52
Step 2			.09	
ADAP-P	0.45	0.28		1.61
INT-Stress	2.23	0.64		3.48**
Step 3			.01	
ADAP-P	0.39	0.28		1.39
INT-Stress	2.32	0.65		3.57**
ADAP-P X INT-Stress	0.20	0.24		0.86

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; ADAP-P = Adaptive Perfectionism; INT-Stress = Appraised stress for the interpersonal event.

* $p < .05$, ** $p < .01$, *** $p < .001$

Next, regression analyses were conducted examining the maladaptive perfectionism dimension. The results of these regressions are presented in Table 13. Maladaptive perfectionism was a significant main effect predictor for both AD and AA symptoms. In addition, appraised interpersonal stress predicted AA symptoms as a main effect. Finally, although the interaction between maladaptive perfectionism and appraised achievement stress did not significantly predict AA, this interaction did

Table 13

Hierarchical Regression Analyses Predicting Time 1 Symptom Scores With Maladaptive Perfectionism and Appraised Stress for the Interpersonal Event (N = 123)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T1				
Step 1			.08	
MAL-P	1.23	0.38		3.24**
Step 2			.03	
MAL-P	1.13	0.38		3.00**
INT-Stress	1.98	1.07		1.86
Step 3			.07	
MAL-P	1.22	0.37		3.33**
INT-Stress	1.46	1.04		1.40
MAL-P X INT-Stress	-0.93	0.30		-3.11**
DV = AA-T1				
Step 1			.09	
MAL-P	0.80	0.23		3.53**
Step 2			.07	
MAL-P	0.71	0.22		3.21**
INT-Stress	1.96	0.63		3.13**
Step 3			.02	
MAL-P	0.69	0.22		3.11**
INT-Stress	2.11	0.63		3.35**
MAL-P X INT-Stress	0.28	0.18		1.53

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; MAL-P = Maladaptive Perfectionism; INT-Stress = Appraised stress for the interpersonal event.

* $p < .05$, ** $p < .01$, *** $p < .001$

significantly predict AD. However, the interaction term was negative, reflecting an effect in the opposite direction of that predicted.

Examination of this interaction with the simple slopes approach revealed that the slopes for the simple regression lines representing high and low maladaptive perfectionism were not significantly different from zero. However, the slopes of the two regression lines were significantly different from one another. See Figure 4 for a graphical representation of this interaction. The graph suggests that there was a

difference in the level of anhedonic depression experienced by those with low versus high maladaptive perfectionism only when appraised stress scores were low. That is, the pattern of the simple regression lines suggests that for those high in maladaptive perfectionism, level of appraised stress had a minimal impact on level of anhedonic depression symptoms. However, for those *low* in maladaptive perfectionism, increasing appraised stress was related to increasing levels of anhedonic depression. This finding was unexpected and will be discussed further below.

Given the specific nature of the stressful event under examination (i.e., in the interpersonal domain), the specific vulnerability hypothesis was also tested. That is, specifically SPP was predicted to interact with appraised interpersonal stress to predict symptoms. The results of these hierarchical regressions are presented in Table 14. Contrary to hypotheses, the interaction between SPP and appraised stress did not significantly predict anxious arousal. However, this interaction did significantly predict anhedonic depression; however, the interaction term was negative, reflecting an effect in the opposite direction of that predicted.

The same simple slopes procedure revealed that for high SPP, the simple regression line had a slope that was not significantly different from zero. However, for low SPP, the simple regression line of appraised stress on anhedonic depression showed a positive slope that was significantly different from zero. In addition, the slopes of the

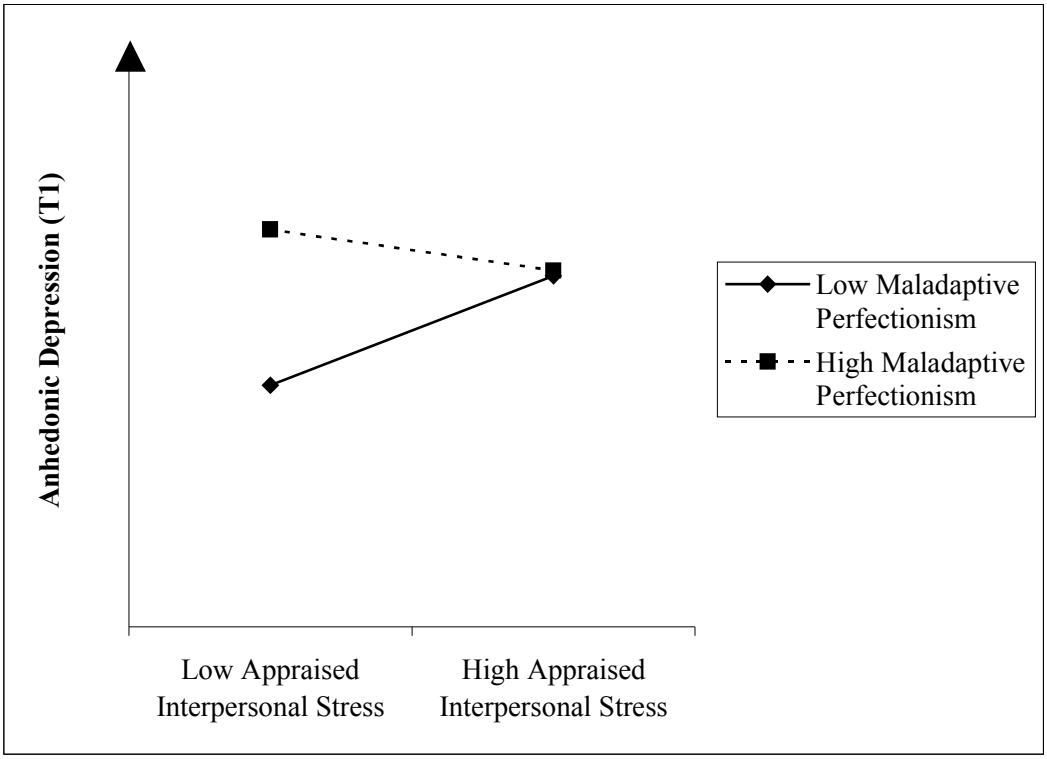

Figure 4. Significant interaction between maladaptive perfectionism and appraised interpersonal stress predicting symptoms of anhedonic depression.

Table 14

Hierarchical Regression Analyses Predicting Time 1 Symptom Scores With Socially-Prescribed Perfectionism and Appraised Stress for the Interpersonal Event (N = 123)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T1				
Step 1			.11	
SPP	0.37	0.10		3.91***
Step 2			.02	
SPP	0.34	0.10		3.52**
INT-Stress	1.61	1.07		1.51
Step 3			.06	
SPP	0.41	0.10		4.24***
INT-Stress	0.89	1.07		0.83
SPP X INT-Stress	-0.23	0.08		-2.89**
DV = AA-T1				
Step 1			.11	
SPP	0.22	0.06		3.86***
Step 2			.06	
SPP	0.19	0.06		3.29**
INT-Stress	1.78	0.63		2.81**
Step 3			.01	
SPP	0.17	0.06		2.93**
INT-Stress	1.93	0.65		2.96**
SPP X INT-Stress	0.05	0.05		0.99

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; SPP = Socially-Prescribed Perfectionism; INT-Stress = Appraised stress for the interpersonal event.

* $p < .05$, ** $p < .01$, *** $p < .001$

two lines were significantly different from one another. See Figure 5 for a graphical representation. This interaction mirrors the interaction between maladaptive perfectionism and appraised stress reported above. That is, for individuals high in SPP, level of appraised interpersonal stress did not seem to have an impact on anhedonic depression scores. However, for individuals *low* in SPP, increasing appraised stress did predict increasing levels of anhedonic depression. Again, these findings were unexpected and will be discussed further below.

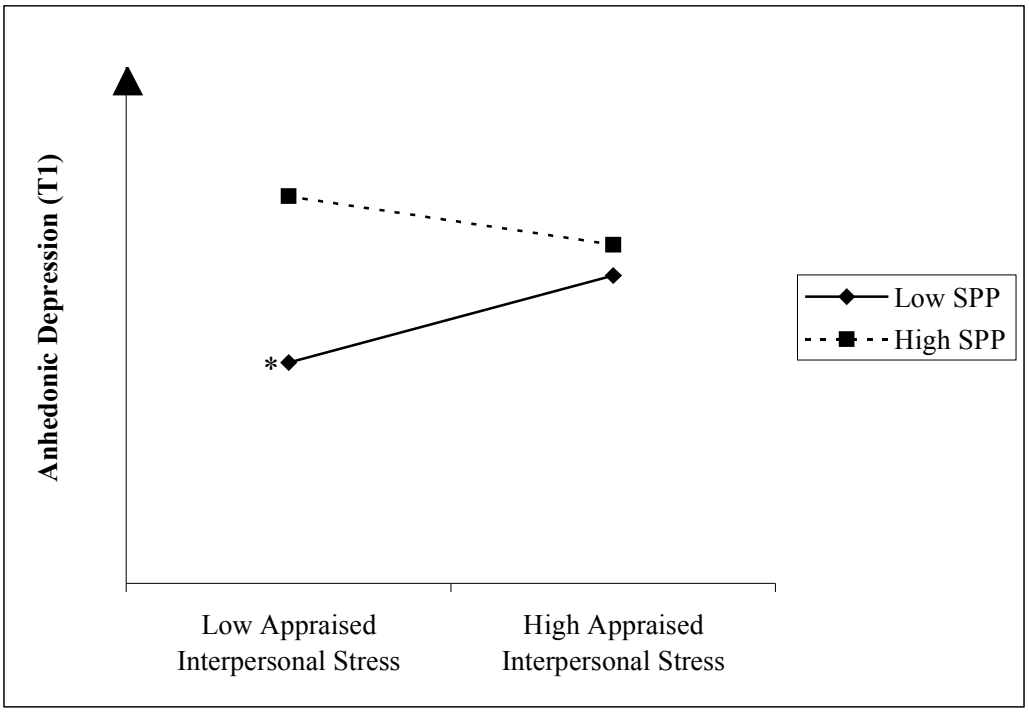

Figure 5. Significant interaction between Socially-Prescribed Perfectionism and appraised interpersonal stress predicting symptoms of anhedonic depression.

* Slope significantly different from zero, $t(120) = 3.06$, $p < .01$

To fully test the specific vulnerability hypothesis, another series of hierarchical regressions were run. These analyses were identical to the above, except SOP was entered as the measure of perfectionism in Block 1. These analyses were run as a control. That is, given that the appraised stress was related to an interpersonal event, the perfectionism dimension of SOP would not be expected to interact with this measure of stress to predict symptoms. Indeed, this interaction term did not significantly predict either of the specific symptom measures (both p values > .10).

Stress Generation Hypotheses

The stress generation hypothesis predicts that perfectionists have a tendency to engage in behaviours, make choices, or pursue unrealistic goals that create stressful events or circumstances. Thus individuals high in perfectionism may be exposed to a greater number of stressful events than individuals low in perfectionism.

Basic Stress Generation Hypothesis

The first goal was to examine whether particular perfectionism dimensions (i.e., adaptive and maladaptive perfectionism) were indeed related to a greater total number of stressful life events experienced over the 4-month period between the Time 1 and 2 evaluations (i.e., LEQ-Total). Bivariate correlations revealed that only maladaptive perfectionism was significantly associated with total number of stressful life events, $r(301) = .20$, $p < .001$.

Next, a regression analysis was conducted with total number of stressful events as the dependent variable. General distress (assessed at Time 1) was entered as a covariate in Block 1, and maladaptive perfectionism was entered as a predictor in Block 2. This

analysis found that only general distress was a significant predictor of number of stressful events, β = .24, $t(298) = 3.87$, $p = .000$. Maladaptive perfectionism was a significant predictor of number of stressful events at only a trend-level, β = .10, $t(298) = 1.67$, $p = .096$. Thus, the original finding of maladaptive perfectionism predicting greater stress generation seems to have been at least partly accounted for by the effects of concurrent general negative affect.

Specific Vulnerability Hypothesis and Stress Generation

The second goal was to test the perfectionism specific vulnerability hypothesis as it related to stress generation. That is, it was predicted that SOP would be preferentially related to a greater number of achievement events, and SPP would be preferentially related to a greater number of interpersonal events. Bivariate correlations revealed that neither SOP, nor SPP, was significantly associated with number of achievement events. Only SPP was significantly correlated with total number of interpersonally-related stressful events, $r(301) = .15$, $p < .01$.

Next, a regression analysis was conducted with number of interpersonal events as the dependent variable. General distress was entered as a covariate in Block 1 and SPP was entered as a predictor in Block 2. This analysis found that only general distress was a significant predictor of number of interpersonal events, β = .20, $t(298) = 3.24$, $p = .001$. Again, the original finding that SPP was associated with a greater number of interpersonal events seems to have been accounted for by the effects of concurrent general negative affect. Thus, contrary to predictions, perfectionism was not directly associated with greater stress generation in this investigation.

Testing Diathesis-Stress Models in the Prediction of Symptoms

The third goal was to test a diathesis-stress model to predict specific symptoms of depression and anxiety. A series of hierarchical multiple regression analyses were conducted. In each analysis, the dependent variable was a specific Time 2 symptom measure. The corresponding Time 1 symptom measure was always entered as a control in the first predictor block. A specific perfectionism dimension was entered in Block 2, the relevant measure of number of stressful events was entered in Block 3[9], and their interaction term was entered in Block 4.

First, a series of regressions were conducted with adaptive perfectionism as the specific perfectionism dimension and total number of stressful life events from the LEQ as the measure of stress. The results of these hierarchical regressions are presented in Table 15. In all the regressions, the Time 1 symptom measure was the strongest predictor for the Time 2 symptom measure. Adaptive perfectionism did not predict either symptom measure as a main effect. Number of stressful life events significantly predicted symptoms of anxious arousal. Finally, although the interaction between adaptive perfectionism and total number of events did not significantly predict AD, this interaction did significantly predict symptoms of AA.

[9] The LEQ provided both global (i.e., LEQ-total) and more specific (i.e., LEQ-Achievement and LEQ-Interpersonal) measures of number of stressful life events experienced. Thus, when examining the more global measures of adaptive and maladaptive perfectionism, LEQ-total was used as the measure of stress. When the more specific measures of perfectionism (SOP and SPP) were examined, the more specific life events measures were used.

Table 15

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Adaptive Perfectionism and Total Number of Stressful Events (N = 301)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.30	
AD-T1	0.58	0.05		11.32***
Step 2			.00	
AD-T1	0.57	0.05		11.14***
ADAP-P	0.17	0.24		0.70
Step 3			.01	
AD-T1	0.57	0.05		11.12***
ADAP-P	0.16	0.24		0.68
LEQ-Total	0.32	0.19		1.65
Step 4			.00	
AD-T1	0.57	0.05		11.10***
ADAP-P	0.16	0.24		0.68
LEQ-Total	0.32	0.20		1.62
ADAP-P X LEQ-Total	0.01	0.07		0.10
DV = AA-T2				
Step 1			.30	
AA-T1	0.49	0.04		11.30***
Step 2			.01	
AA-T1	0.47	0.04		10.87***
ADAP-P	0.23	0.14		1.65
Step 3			.01	
AA-T1	0.45	0.04		10.12***
ADAP-P	0.24	0.14		1.72
LEQ-Total	0.29	0.11		2.51*
Step 4			.02	
AA-T1	0.44	0.04		9.88***
ADAP-P	0.26	0.14		1.89
LEQ-Total	0.26	0.11		2.32*
ADAP-P X LEQ-Total	0.10	0.04		2.60**

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; ADAP-P = Adaptive Perfectionism; LEQ-Total = Total number of stressful life events.

* $p < .05$, ** $p < .01$, *** $p < .001$

Simple slopes analysis revealed that the slopes of the simple regression lines for high and low adaptive perfectionism were not significantly different from zero. However, the slopes of the two lines were significantly different from each other. See

Figure 6 for a graphical representation. This interaction indicates that for those low in adaptive perfectionism, the number of stressful life events experienced did not have an impact on the level of anxious arousal symptoms reported. However, for those high in adaptive perfectionism, increasing number of stressful life events was related to greater anxious arousal scores. That is, those high in adaptive perfectionism and high in the number of stressful life events experienced were the most likely to have the highest anxious arousal scores. Thus, contrary to past research suggesting that adaptive perfectionism is associated with healthy outcomes, in this investigation this perfectionism dimension seemed to act as a vulnerability factor.

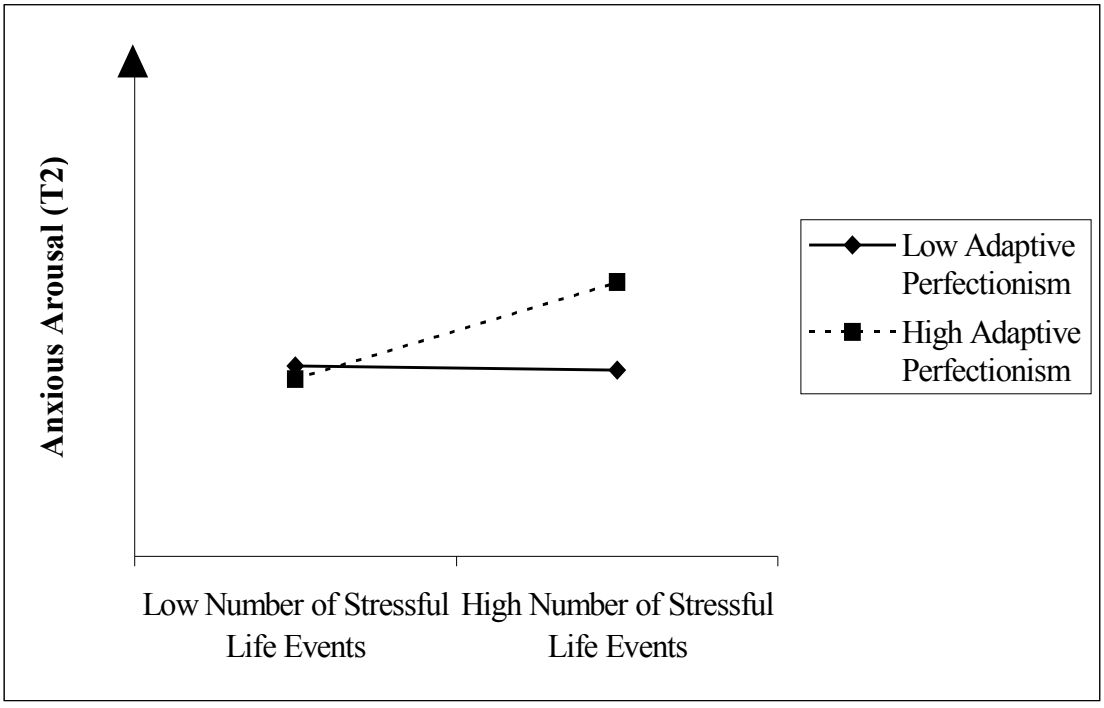

Figure 6. Significant interaction between adaptive perfectionism and total number of stressful life events predicting symptoms of anxious arousal.

Next, another series of hierarchical regressions were conducted, but this time, maladaptive perfectionism was entered as the measure of perfectionism. The results of these hierarchical regressions are presented in Table 16. Again, in all the regressions, the Time 1 symptom measure was the strongest predictor for the Time 2 symptom measure. Maladaptive perfectionism predicted both AD and AA as a main effect predictor. Number of stressful life events did not significantly predict either symptom measure as a main effect predictor. Finally, no evidence was found for a significant interaction between MAL-P and LEQ-Total in predicting either symptoms of AD or AA.

The final goal was to test the perfectionism specific vulnerability hypothesis in predicting symptoms of anxiety and depression. That is, it was predicted that SOP would specifically interact with number of achievement events to predict symptoms, and SPP would specifically interact with number of interpersonal events to predict symptoms. Hierarchical multiple regression analyses were conducted with SOP as the perfectionism dimension of interest and number of achievement events as the stress measure. The results of these hierarchical regressions are presented in Table 17. Again, in both regression models, the Time 1 symptom measure was the strongest predictor for the Time 2 symptom measure. SOP did not significantly predict either symptom measure as a main effect in the full model. Number of achievement events did predict symptoms of AD as a main effect. Finally, although the interaction between SOP and LEQ-ACH did not significantly predict AD, this interaction did significantly predict AA.

Table 16

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Maladaptive Perfectionism and Total Number of Stressful Events (N = 301)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.30	
AD-T1	0.58	0.05		11.32***
Step 2			.04	
AD-T1	0.51	0.05		9.78***
MAL-P	0.89	0.22		4.04***
Step 3			.00	
AD-T1	0.51	0.05		9.80***
MAL-P	0.85	0.22		3.78***
LEQ-Total	0.18	0.19		0.91
Step 4			.00	
AD-T1	0.51	0.05		9.78***
MAL-P	0.84	0.23		3.74**
LEQ-Total	0.17	0.19		0.89
MAL-P X LEQ-Total	0.01	0.05		0.12
DV = AA-T2				
Step 1			.30	
AA-T1	0.49	0.04		11.30***
Step 2			.04	
AA-T1	0.43	0.04		9.98***
MAL-P	0.56	0.13		4.43***
Step 3			.01	
AA-T1	0.42	0.04		9.52***
MAL-P	0.52	0.13		4.12***
LEQ-Total	0.22	0.11		1.91
Step 4			.01	
AA-T1	0.41	0.04		9.28***
MAL-P	0.51	0.13		4.00***
LEQ-Total	0.19	0.11		1.72
MAL-P X LEQ-Total	0.06	0.03		1.80

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; MAL-P = Maladaptive Perfectionism; LEQ-Total = Total number of stressful life events.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 17

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Self-Oriented Perfectionism and Number of Stressful Achievement Events (N = 301)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.30	
AD-T1	0.58	0.05		11.32***
Step 2			.01	
AD-T1	0.57	0.05		11.10***
SOP	0.08	0.05		1.68
Step 3			.02	
AD-T1	0.55	0.05		10.66***
SOP	0.08	0.05		1.84
LEQ-ACH	1.84	0.71		2.60*
Step 4			.00	
AD-T1	0.55	0.05		10.65***
SOP	0.08	0.05		1.86
LEQ-ACH	1.79	0.72		2.49*
SOP X LEQ-ACH	-0.02	0.04		-0.49
DV = AA-T2				
Step 1			.30	
AA-T1	0.49	0.04		11.30***
Step 2			.01	
AA-T1	0.47	0.04		10.80***
SOP	0.05	0.03		1.87
Step 3			.00	
AA-T1	0.46	0.04		10.57***
SOP	0.05	0.03		1.94*
LEQ-ACH	0.47	0.41		1.13
Step 4			.02	
AA-T1	0.45	0.04		10.07***
SOP	0.05	0.03		1.92
LEQ-ACH	0.65	0.42		1.56
SOP X LEQ-ACH	0.07	0.03		2.58**

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; SOP = Self-Oriented Perfectionism; LEQ-ACH = Total number of achievement-related stressful life events.

* $p < .05$, ** $p < .01$, *** $p < .001$

That is, for high SOP, the simple regression line of LEQ-ACH on anxious arousal showed a positive slope that was significantly different from zero. However, for low SOP the slope of the simple regression line was not significantly different from zero. The slopes of the two lines were significantly different from each other. See Figure 7 for a graphical representation. This interaction indicates that SOP seems to act as a vulnerability factor, interacting with the theoretically matched number of stressful achievement events to significantly predict anxious arousal symptoms. That is,

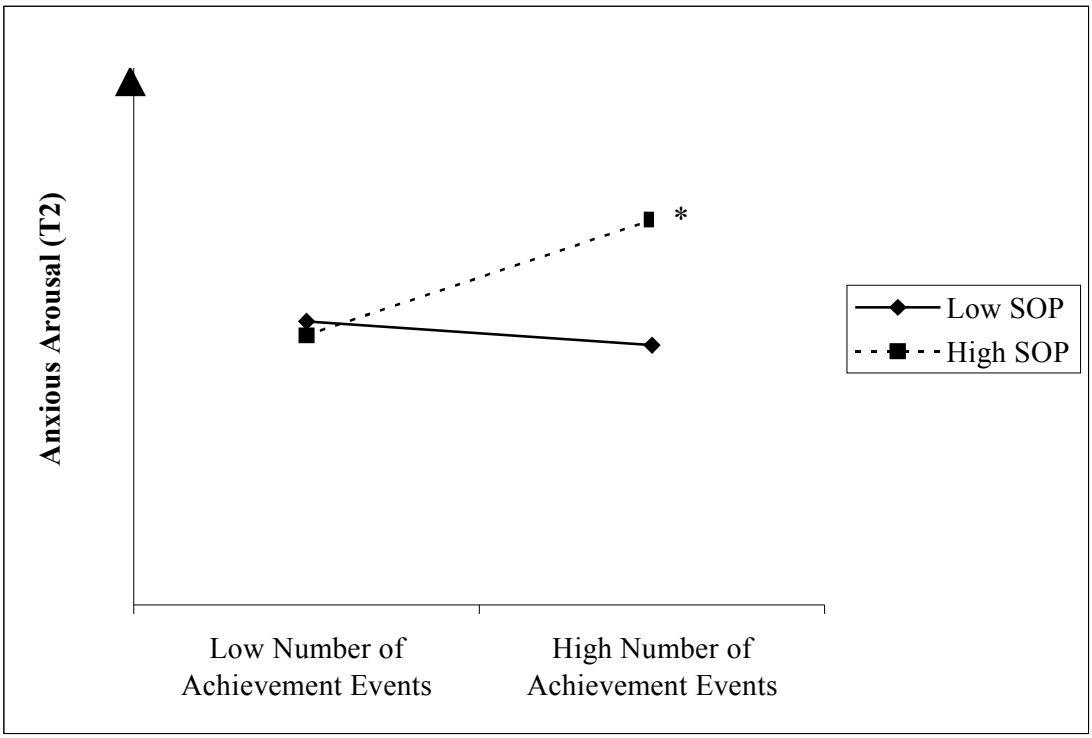

Figure 7. Significant interaction between Self-Oriented Perfectionism and number of stressful achievement events predicting symptoms of anxious arousal.

* Slope significantly different from zero, $t(297) = 2.40$, $p < .01$

increasing number of achievement events predicted increasing anxious arousal symptoms only for those high in SOP. Interestingly, this interaction effect is entirely consistent with the interaction between SOP and *appraised stress* for the achievement event predicting specifically anxious arousal.

In order to fully test the specific vulnerability hypothesis, another series of hierarchical regressions were run. These analyses were identical to the above, except SPP was entered as the measure of perfectionism in Block 2. These analyses were run as a control. That is, according to the specific vulnerability hypothesis, SPP would not be expected to interact with the number of achievement events (incongruent stressor) to predict symptoms. Indeed, this interaction term did not significantly predict either of the specific symptom measures (both p values > .76).

Finally, a series of hierarchical multiple regression analyses were conducted to look at the interaction between SPP and number of interpersonal events in predicting symptoms. The results of these hierarchical regressions are presented in Table 18. Again, in all the regressions, the Time 1 symptom measure was the strongest predictor for the Time 2 symptom measure. SPP significantly predicted both symptom measures as a main effect. Number of interpersonal events did not significantly predict symptoms as a main effect. Finally, no evidence was found for a significant SPP by LEQ-INT interaction for either of the specific symptom measures.

Again, in order to fully test the specific vulnerability hypothesis, another series of hierarchical regressions were run. These analyses were identical to the above, except SOP was entered as the measure of perfectionism in Block 2. These analyses were run as

Table 18

Hierarchical Regression Analyses Predicting Time 2 Symptom Scores With Socially-Prescribed Perfectionism and Number of Stressful Interpersonal Events (N = 301)

Variable	*b*	*SE b*	R^2 change	*t*
DV = AD-T2				
Step 1			.30	
AD-T1	0.58	0.05		11.32***
Step 2			.02	
AD-T1	0.52	0.05		9.70***
SPP	0.18	0.06		3.25**
Step 3			.00	
AD-T1	0.52	0.05		9.70***
SPP	0.18	0.06		3.11**
LEQ-INT	0.13	0.23		0.56
Step 4			.00	
AD-T1	0.52	0.05		9.69***
SPP	0.18	0.06		3.06**
LEQ-INT	0.13	0.23		0.55
SPP X LEQ-INT	0.003	0.02		0.16
DV = AA-T2				
Step 1			.30	
AA-T1	0.49	0.04		11.30***
Step 2			.04	
AA-T1	0.43	0.04		9.82***
SPP	0.13	0.03		4.02***
Step 3			.01	
AA-T1	0.42	0.04		9.45***
SPP	0.12	0.03		3.84***
LEQ-INT	0.25	0.14		1.88
Step 4			.00	
AA-T1	0.41	0.05		9.27***
SPP	0.12	0.03		3.69***
LEQ-INT	0.26	0.14		1.91
SPP X LEQ-INT	0.01	0.01		1.38

Note. AD-T1 = Anhedonic Depression – Time 1; AA-T1 = Anxious Arousal – Time 1; AD-T2 = Anhedonic Depression – Time 2; AA-T2 = Anxious Arousal – Time 2; SPP = Sociall-Prescribed Perfectionism; LEQ-INT = Total number of interpersonally-related stressful life events.

* $p < .05$, ** $p < .01$, *** $p < .001$

a control. That is, according to the specific vulnerability hypothesis, SOP would not be expected to interact with the number of interpersonal events (incongruent stressor) to predict symptoms. Indeed, this interaction term did not significantly predict either of the specific symptom measures (both p values > .10).

Chapter 5
Discussion

The current investigation was aimed at examining a number of diathesis-stress processes or mechanisms linking trait perfectionism, stress, and specific psychopathological symptoms. Though past research has clearly demonstrated that perfectionism is associated with a wide variety of psychological, emotional, cognitive, and interpersonal difficulties, research is just beginning to emerge elucidating the processes by which a perfectionistic personality style comes to be associated with such negative outcomes (e.g., Enns & Cox, 2005; Enns et al., 2005). A number of researchers, most notably Hewitt and Flett (2002), have made important theoretical advances by delineating diathesis-stress models describing how stress interacts with perfectionistic personality to produce or maintain various psychological disorders and symptoms. The main goal of this study was to draw from this emerging body of theoretical and empirical work and examine the processes of perfectionistic stress enhancement and stress generation. In addition, these stress processes were examined in the context of a number of specific diathesis-stress models predicting symptoms of depression and anxiety. Two conceptualizations of perfectionism were considered. First, the validity of the adaptive-maladaptive perfectionism typology was examined. The adaptive perfectionism dimension was of particular interest because it remains unclear whether this dimension is consistently related to positive or healthy outcomes. Second, the intrapersonal-interpersonal distinction, reflected in the dimensions of SOP and SPP, was examined and the perfectionism specific vulnerability hypothesis was tested. That is, perfectionists

were expected to be particularly vulnerable to experience distress in response to specific types of events. An SOP personality diathesis was expected to be most likely triggered by achievement-related stressors and an SPP diathesis was expected to be most likely triggered by interpersonally-related stressors.

Perfectionistic Stress Enhancement

The findings of this investigation provide evidence for the process of perfectionistic stress enhancement. Regarding the basic stress enhancement hypothesis, various dimensions of perfectionism were indeed significantly predictive of greater appraised stress for the examined events. Given that there were two specific stressful events examined, they will be considered separately.

Achievement Event

A number of interesting findings were observed when examining the adaptive and maladaptive perfectionism dimensions. First, both of these perfectionism dimensions were significantly and positively correlated with appraised stress for the achievement event. However, when a regression analysis was conducted including both dimensions as predictors and controlling for the impact of general negative distress or affect, only *adaptive* perfectionism was found to prospectively predict appraised achievement stress. Thus, contrary to past research highlighting the healthy and positive aspects of adaptive perfectionism, this study found that this form of perfectionism was associated with stress enhancement for an achievement-related event. Moreover, this effect was observed controlling for the potential overlap between adaptive and maladaptive perfectionism – it

was specifically adaptive perfectionism that was related to increased appraised achievement stress.

The adaptive perfectionism dimension used in this study was comprised of items from the SOP, OOP, PS, and O subscales. Examining the individual items from these subscales, in particular the items from the SOP and PS subscales, provides some insight into why this specific perfectionism dimension was predictive of increased appraised achievement stress. Adaptive perfectionists are internally driven and their perfectionistic motivations are ego-syntonic which may be seen as healthy. However, they also set extremely high standards for themselves *and* fully expect and need to attain these high standards. This is reflected in some of the items from the SOP and PS subscales: "I have extremely high goals", "If I do not set the highest standards for myself, I am likely to end up a second-rate person", "I must work to my full potential at all times", "I expect higher performance in my daily tasks than most people", "I must always be successful at school or work". These items also suggest that an achievement event such as an exam would likely be important and relevant for a first-year university student high in adaptive perfectionism and associated with extremely high expectations regarding performance. Thus, poor performance on the exam would be particularly stressful for this individual, compared to a nonperfectionistic student who had lower, perhaps more realistic, expectations for the exam event. As long as high standards and expectations are being met, an adaptive perfectionist might report more positive affect and adaptive characteristics, such as higher confidence and self-esteem, than a nonperfectionist. This might explain why previous research has found that this perfectionism dimension is

associated with a variety of positive correlates. However, when faced with a perceived failure, an adaptive perfectionist is likely to appraise that stressful event (particularly if it is in the achievement domain) as quite distressing, more distressing than a nonperfectionistic individual who placed less importance on the event to begin with.

The findings of this study also indicate that an adaptive perfectionist would find an achievement-related failure more distressing than even a maladaptive perfectionist. Examining the nature of the maladaptive perfectionism dimension might shed light on why this is the case. The maladaptive perfectionism dimension used in this investigation was comprised of items from the SPP, CM, PE, and PC subscales. Thus, maladaptive perfectionists are very concerned about making mistakes because this is indicative of failure and may result in disapproval and rejection by important others. Items reflecting this concern over making mistakes include the following: "I should be upset if I make a mistake", "If I fail partly, it is as bad as being a complete failure", "The fewer mistakes I make, the more people will like me". Moreover, a key feature of maladaptive perfectionism is having the belief that one's significant others (particularly parents) have extremely high standards and expectations for one's performance and that somehow one falls short of these expectations. Some items reflecting this belief include the following: "Only outstanding performance is good enough in my family", "I never felt like I could meet my parents' expectations", "Anything that I do that is less than excellent will be seen as poor work by those around me".

Thus, essentially, the maladaptive perfectionism orientation is ego-dystonic in that perfectionistic motivations are rooted in others' expectations. Thus, for the

maladaptive perfectionist, the expectations for performance on the exam might have been externally-imposed. Therefore, failure to meet these achievement-related expectations may not have been nearly as ego-involving. For the maladaptive perfectionist, the exam event may have represented a more distal threat, but one that might lead to a more salient personally-relevant threat – that more salient threat being the possible negative evaluation or criticism from important others. However, because the exam event was not as immediately salient, it may not have been as distressing for maladaptive perfectionists. However, for adaptive perfectionists, the expectations for performance on the exam were likely self-imposed. Thus, failure to meet these expectations would be more ego-involving and therefore more likely to lead to feelings of disappointment, self-blame, and self-criticism. For the adaptive perfectionist, the negative exam event may have been an immediate, salient, and personally-relevant threat. Consequently, the event would have been perceived as particularly stressful.

Not surprisingly, in examining the intrapersonal-interpersonal perfectionism distinction in the context of stress enhancement, this study found that only SOP predicted appraised achievement stress. While both SOP and SPP were significantly and positively correlated with appraised achievement stress, when a regression analysis was conducted including both dimensions as predictors and controlling for the impact of general negative affect, only SOP was found to predict appraised achievement stress. This effect essentially mirrors the above finding between adaptive perfectionism and appraised achievement stress. This is not unexpected given that the adaptive perfectionism dimension includes SOP as part of its calculation and the two are so highly

intercorrelated. This finding provides further support for the process of perfectionistic stress enhancement. Moreover, this finding provides support for the perfectionism specific vulnerability hypothesis in that it was specifically SOP that was related to increased stress appraisals for an *achievement* event. Individuals high in SOP are achievement focused and have a tendency to set extremely high achievement goals. Failure to meet these achievement-related goals would be considered a blow to the individual's ego and, therefore, particularly distressing.

Interpersonal Event

In regards to the basic stress enhancement process for the interpersonally-related event, neither adaptive nor maladaptive perfectionism dimensions were predictive of greater appraised stress. These findings suggest that perfectionists may be more likely to find achievement-related stressors distressing. Given that, in general, perfectionism is regarded as a personality style involving a strong achievement orientation, this finding is not surprising and provides further external validity of the conceptualization of the trait.

When examining the intrapersonal-interpersonal dimensions of perfectionism, only SPP was found to be significantly and positively correlated with appraised stress. This is consistent with the specific vulnerability hypothesis in that SPP was specifically associated with greater appraised *interpersonal* stress. Individuals high in SPP are very much concerned about others' evaluations and strive for perfection because they feel that others expect this. Thus, an interpersonally-related stressor might be particularly distressing. However, a regression analysis showed that after controlling for the effect of concurrent general negative affect, SPP no longer significantly predicted appraised

interpersonal stress. This finding suggests that although SPP is positively associated with greater appraised interpersonal stress, it is not the characteristics of SPP per se that drive this effect. Rather, it may be the general negative affect associated with having an SPP personality style that mediates the relationship between SPP and appraised interpersonal stress.

As aforementioned, individuals high in SPP strive for perfection because they believe that significant others expect perfection. They have a high need for approval from others and fear negative evaluation from others. This orientation and its ego-dystonic nature would likely result in a high level of general negative affect or distress, regardless of whether or not more acute stressful events actually occurred. Essentially, individuals high in SPP may be chronically distressed – constantly feeling like they are under pressure to perform because they may be at risk of losing important others' respect and approval. Unlike individuals high in SOP, who become distressed when personal goals fail to be attained, individuals high in SPP are to an extent always distressed because their perfectionism is not self-directed and they fear others' negative evaluation. When considered in this context, the finding that general negative affect mediated the relationship between SPP and appraised interpersonal stress becomes more understandable. Having a personality orientation characterized by SPP may result in chronic feelings of general negative affect. When faced with acute stressors, this negative affect may contribute to the stress enhancement process by making these stressors seem even more negative and distressing.

Perfectionistic Stress Generation

The findings of this investigation also provide some interesting insights into the hypothesized process of perfectionistic stress generation. Regarding the basic stress generation hypothesis, dimensions of perfectionism were indeed found to be significantly and positively associated with number of reported stressful life events in the interval between the Time 1 and 2 evaluations. More specifically, maladaptive perfectionism, but not adaptive perfectionism, was positively associated with total number of stressful life events. In addition, SPP, but not SOP, was positively associated with only the number of interpersonally-related stressful life events (consistent with the specific vulnerability hypothesis). However, these stress generation effects were no longer observed after controlling for concurrent general negative affect or distress. Therefore, although having a personality style characterized by perfectionistic tendencies may be linked to the experience of more stressful life events over time, this investigation found that the general negative affect that may come along with having a perfectionistic personality style accounted for this stress generation effect. These effects mirror the stress enhancement finding for SPP and appraised interpersonal stress.

Again, both maladaptive perfectionism and SPP are characterized by a more pathological orientation than the dimensions of adaptive perfectionism and SOP. Individuals high in maladaptive perfectionism and SPP are likely chronically distressed and this distress seems to also contribute to increasing the number of stressful life events experienced. For example, an individual endorsing high levels of maladaptive perfectionism might feel pressured by his/her parents to perform perfectly at school. This

pressure might result in feeling worried, tense, and sad because he/she fears losing parental approval and respect, as well as resentful and irritable because these perfectionistic standards are not their own. These symptoms of general negative affect or distress then might lead the individual to experience a host of stressful events. For example, excessive worries and fears might result in performance anxiety and ultimately poor academic functioning, or irritability and sadness might make it difficult to connect with peers resulting in compromised interpersonal interactions.

Perfectionism and Psychopathological Symptoms

The current study also examined the role of perfectionism, stress, and their interaction in predicting psychopathological symptoms.

Perfectionism as a Direct Predictor of Symptoms

Several dimensions of perfectionism significantly predicted symptoms as main effect predictors. More specifically, both maladaptive perfectionism and SPP directly predicted increases in symptoms of anhedonic depression and anxious arousal over a 4-month interval in all the regression models tested. That is, individuals reporting high levels of maladaptive perfectionism or SPP at Time 1 were significantly more likely to report high levels of symptoms at Time 2. Again, this highlights the more pathological nature of maladaptive perfectionism and SPP, as compared to adaptive perfectionism and SOP. These findings are consistent with past research. Numerous studies have consistently shown that maladaptive perfectionism is associated with emotional maladjustment in the form of negative affect, depression, and anxiety (Stoeber & Otto, 2006). In addition, past research has also shown that SPP is a direct predictor of

depression symptoms (e.g., Hewitt & Flett, 1993; Hewitt et al., 1996). Past investigations, however, have for the most part used general, non-specific measures such as the BDI, measures that often cannot distinguish specific symptoms of depression (or anxiety) from general negative affect. The findings of the present study help to confirm that that both maladaptive perfectionism and SPP are predictive of more specific symptoms (in this case, anxious arousal and anhedonic depression) and not just general negative affect or distress.

Perfectionism-Stress Interactions as a Predictor of Symptoms

Perfectionism also interacted with various stress measures to significantly predict symptoms. Stress appraisals for the two examined events, as well as the number of stressful life events experienced in the interval between the Time 1 and 2 evaluations were examined as relevant forms of stress.

In addition to being main effect predictors of symptoms, both maladaptive perfectionism and SPP also interacted with stress to predict symptoms. More specifically, maladaptive perfectionism interacted with appraised achievement stress to predict anxious arousal symptoms. That is, consistent with hypotheses, those high in maladaptive perfectionism were more likely than those low in maladaptive perfectionism to report higher levels of anxious arousal in the face of high achievement stress. Thus, although maladaptive perfectionism predicts emotional maladjustment directly, relevant stress may act to exacerbate this effect. This finding again suggests that achievement-related stressors are particularly relevant in triggering perfectionism diatheses.

Also, both maladaptive perfectionism and SPP interacted with appraised interpersonal stress to predict anhedonic depression symptoms. However, these interaction effects were not as predicted. That is, it was only participants with *low* maladaptive perfectionism or SPP that were vulnerable to symptoms of anhedonic depression when they endorsed high levels of appraised interpersonal stress. Examining the means for anhedonic depression and appraised interpersonal stress for groups high and low in maladaptive perfectionism or SPP[10] revealed that both depression and stress scores were higher for those high, rather than for those low, in these perfectionism dimensions. These findings are then consistent with the notion that these dimensions of perfectionism more directly predict emotional maladjustment – for individuals high in maladaptive perfectionism or SPP the effect of appraised interpersonal stress on this relationship was negligible. However, for individuals low in maladaptive perfectionism or SPP, the pernicious effects of appraised interpersonal stress came through to predict symptoms of depression. These findings are consistent with past research showing that maladaptive perfectionism and SPP have been consistently associated with negative correlates and represents a personality orientation that is unhealthy (Flett & Hewitt, 2006; Stoeber & Otto, 2006).

Thus, findings related to maladaptive perfectionism and SPP observed in this study suggest that these dimensions of perfectionism are much more pathological than adaptive perfectionism and SOP. The negative characteristics of maladaptive perfectionism and SPP (i.e., ego-dystonic perfectionism, fear of negative evaluation, need

[10] Groups were based on 1 standard deviation below and above the mean.

for others' approval) are likely associated with chronic general negative affect or distress. Thus, the pathway from these dimensions of perfectionism to emotional maladjustment can be more direct (i.e., acute stressors are not required to trigger the diathesis). The additional impact of stress may exacerbate the pernicious effects of perfectionism in predicting emotional maladjustment (e.g., maladaptive perfectionism interacting with appraised achievement stress to predict anxiety). However, the effects of stress do not seem to be necessary in triggering either of these perfectionism dimensions to predict increases in psychopathological symptoms.

By contrast, the pathway from the dimensions of adaptive perfectionism and SOP to emotional maladjustment is different. This study found that adaptive perfectionism and SOP did not predict symptoms directly in any of the regression models tested. Instead, these dimensions significantly predicted increases in symptoms via interactions with stress. More specifically, both adaptive perfectionism and SOP interacted with *appraised achievement stress* to predict increases in anxious arousal. That is, individuals high in adaptive perfectionism or SOP, who also experienced high levels of appraised achievement stress, were likely to report higher levels of anxious arousal. Moreover, adaptive perfectionism interacted with *total number of stressful life events* and SOP interacted with *number of achievement events* to significantly predict increases in symptoms of anxious arousal. That is, individuals high in adaptive perfectionism or SOP, who also experienced a high number of stressful life events, were particularly vulnerable to experience anxious arousal symptoms. These findings are compelling for a number of reasons. Contrary to past research suggesting that adaptive perfectionism is positive and

healthy, these findings suggest that when contextual factors are considered, adaptive perfectionism may represent a potential risk for emotional maladjustment in the face of relevant stress. This finding is entirely consistent with Flett and Hewitt's (2006) contention that individuals with a so-called positive form or type of perfectionism are susceptible to psychological and emotional distress when they experience failures or setbacks related to personal goals and standards. These findings also provide further support for the perfectionism specific vulnerability hypothesis – SOP may be a specific vulnerability factor for emotional maladjustment, particularly when triggered by achievement-related stressors. These results indicate that both the number of achievement events experienced and the way in which those events are appraised are important in triggering the SOP diathesis.

Thus, findings related to the dimensions of adaptive perfectionism and SOP suggest that, although not as pathological as the dimensions of maladaptive perfectionism and SPP, these dimensions can lead to increases in emotional maladjustment, particularly anxiety, when paired with relevant stressors. Perhaps adaptive perfectionism and SOP confer some advantages when an individual is meeting his/her achievement-related goals. Given that perfectionistic goals are self-directed and personally-relevant, attaining these goals might lead to feelings of autonomy and control, confidence, and positive affect[11]. However, the fact that adaptive perfectionists *need* and *fully expect* to meet their extremely high goals, and that these standards are held rigidly, may be quite maladaptive,

[11] Though, there is debate about whether perfectionistic individuals, even adaptive perfectionists or those high in SOP, actually feel true satisfaction and pleasure from their accomplishments (see Hewitt & Flett, 2006).

particularly when goals are *not* met. In these failure situations, those high in adaptive perfectionism and SOP are likely to experience significant emotional maladjustment (i.e., anxious arousal).

Conceptualizations of Perfectionism

This investigation aimed to examine two different, but related, frameworks for understanding perfectionistic personality. The first was the adaptive-maladaptive perfectionism typology that has in recent years received increased research attention. The second was the intrapersonal-interpersonal conceptualization, reflected in the dimensions of SOP and SPP. The findings of this investigation highlight the fact that these two perfectionism conceptualizations are essentially tapping the same constructs. Although theory and research findings related to these two frameworks are often examined and reported separately, in many ways these two conceptualizations are one in the same. To date, the most widely studied adaptive and maladaptive perfectionism dimensions are those created based on the two MPS measures used in this investigation (Frost et al., 1993). Thus, the adaptive perfectionism dimension includes SOP and the maladaptive perfectionism dimension includes SPP. The findings of this investigation showed that adaptive perfectionism and SOP acted similarly in interacting with stress – both dimensions predicted greater stress enhancement for the achievement event, and both constructs interacted with number of stressful life events to predict anxious arousal. Perhaps SOP captures the essence of the higher order construct of adaptive perfectionism. Findings related to maladaptive perfectionism also paralleled findings related to SPP. Both constructs predicted stress generation via symptoms of general negative affect and

both directly predicted symptoms of depression and anxiety. Thus, SPP might represent the essence of the higher order construct of maladaptive perfectionism.

Given that these two perfectionism conceptualizations are essentially tapping the same constructs, a question arises regarding which conceptualization is more useful in understanding perfectionism. Clearly, the results of this investigation do not support the notion that adaptive perfectionism is entirely positive and healthy. All of the dimensions of perfectionism that were examined (i.e., SOP, SPP, adaptive, and maladaptive) were in some way associated with stress and psychopathology. Thus, the results of the present investigation are more consistent with Hewitt and Flett's intrapersonal-interpersonal model of perfectionism than with the adaptive-maladaptive perfectionism typology. The creators of this framework have explicitly argued that SOP and SPP are both essentially maladaptive in nature (see Flett & Hewitt, 2006). However, they have suggested that while SPP is more directly linked to forms of emotional maladjustment, SOP may be linked via the experience of relevant and specific types of stress, namely achievement-related stressors as outlined in the specific vulnerability hypothesis. The findings of this study are entirely consistent with these hypotheses.

Moreover, findings of this investigation did indeed support the hypothesis that specifically achievement-related stressors should trigger an SOP diathesis, providing partial support for the perfectionism specific vulnerability hypothesis. First, only SOP was significantly associated with higher stress appraisals for the examined achievement event (i.e., stress enhancement). In addition, SOP interacted with this appraised achievement stress to predict changes in anxious arousal symptoms over time. Finally,

SOP interacted with only the number of achievement events to predict anxious arousal symptoms over time. By contrast, the hypothesis that specifically interpersonally-related stressors should trigger an SPP diathesis was not supported. Although the SPP X appraised interpersonal stress interaction was found to significantly predict anhedonic depression symptoms, the pattern of this interaction was not in the expected direction. However, this investigation's partial support of the perfectionism specific vulnerability hypothesis is consistent with several previous investigations (e.g., Hewitt & Flett, 1993; Hewitt et al., 1996; Enns & Cox, 2005). These studies also found that SOP consistently interacted with achievement stressors to predict psychopathological symptoms (i.e., depression), while SPP consistently predicted symptoms as a main effect and did not interact with interpersonal stressors to significantly predict symptoms.

The intrapersonal-interpersonal perfectionism distinction is also useful because it may provide some insights relevant for treatment. The different pathways to emotional maladjustment observed for SOP versus SPP highlights potentially different treatment considerations. For example, an individual high in SOP might benefit from a therapeutic intervention focused specifically on minimizing achievement-related stressors. This might involve work related to making achievement goals less rigid and more realistic, as well as modifying thoughts and beliefs related to achievement goals. For example, an individual high in SOP might equate failing an exam with being a complete failure as a person. Cognitive-behavioural strategies might be used to target such maladaptive thoughts and beliefs. On the other hand, an individual high in SPP might benefit from a therapeutic intervention aimed at reducing and managing symptoms of general negative

affect. Given that this study found that general negative affect concurrent to SPP mediated the SPP-stress enhancement and SPP-stress generation effects, working to minimize general negative affect might act to buffer these stress effects. In addition, it might be beneficial to focus on the ego-dystonic nature of the individual's perfectionistic motivations, with the aim of lessening the impact of external pressures.

Why Specifically Anxious Arousal?

This investigation found that several specific perfectionism-diathesis stress interactions predicted symptoms of anxious arousal but not symptoms of anhedonic depression. This finding is very interesting in light of past research examining perfectionism diathesis-stress models. In contrast to the current study, the majority of previous studies have focused on and reported the prediction of symptoms of depression (e.g., Cox & Enns, 2005; Flett et al., 1995; Hewitt et al., 1996). Most studies adopted the BDI as their measure of depression symptomatology. Though the BDI is widely used and its reliability and validity have been well documented (Beck, Steer, & Garbin, 1988), there is some question as to its specificity in targeting symptoms of depression, and distinguishing between these specific symptoms and symptoms anxiety and more general negative affect. One of the major aims of the current study was to utilize more specific symptom measures to elucidate whether perfectionism was associated with any specific set of symptoms, hence the use of the MASQ.

The finding that particular perfectionism-stress interactions predicted specifically anxious arousal, and not anhedonic depression, is intriguing. One possible explanation may involve the nature of the sample used in this investigation. The participants in this

study were a group of first-year undergraduate university students – that is, a nonclinical sample. The majority reported no past or current problems with depression or anxiety at the Time 1 evaluation, thus it is reasonable to assume that the sample was relatively free of serious psychopathology at that time. The fact that several specific perfectionism-stress interactions consistently predicted increases in anxious arousal may suggest an early pathway for how perfectionistic individuals relatively free from psychopathology come to first experience emotional maladjustment in the face of specific kinds of stress. It may be that when an individual with a perfectionistic personality (i.e., adaptive perfectionism or SOP) is faced with stress (i.e., high number of achievement-related stressful events or high levels of appraised achievement stress), the initial emotional reaction involves anxiety and not depression. The research literature on the comorbidity of depression and anxiety may provide some insight.

Alloy, Kelly, Mineka, and Clements (1990) provide an extensive examination of the nature of, and issues related to, the comorbidity of depression and anxiety. They point out a number of general features pertaining to the complex relationship between depression and anxiety that may be relevant to the findings of this study. In particular, they note that *anxiety is more likely to precede depression than the reverse*. This is true both across multiple episodes and within one episode of illness. A number of longitudinal epidemiological studies support the observation that individuals initially presenting with a pure anxiety disorder are more likely to later experience depression than vice versa (Alloy et al., 1990). For example, in one prospective study, 49% of cases with pure anxiety disorders went on to develop major or minor depression, whereas only

33% of those with pure depression went on to develop an anxiety disorder (Angst, Vollrath, Merikangas, and Ernst, 1990 as cited in Alloy et al., 1990).

Particularly relevant to the results of the current investigation, this sequential relationship also exists at the level of symptoms within a single episode. Observational studies of human and non-human primates' responses to separation from an attachment figure, suggests that there is a biphasic response that includes both anxious and depressive type symptoms (Alloy et al., 1990). For example monkeys separated from their mothers, usually exhibit an immediate *protest* response that is characterized by intense agitation/hyperactivity, excessive vocalizations, and a sharp rise in cortisol levels (Mineka, 1985). Then, often, within 1 to 3 days, the infant displays depression-like symptoms such as a sharp decrease in the level of social engagement and play and an increase in self-clasping. This second phase is described as the *despair* phase. It may be that the protest phase is a prototype of human anxiety and the despair phase a prototype for human depression (Alloy et al., 1990). There are also similar findings in the literature on human adults' response to uncontrollable aversive events. For example, it has been argued that when an individual loses control, he/she initially becomes aroused and attempts to regain control (Wortman & Brehm, 1975). This reactance phase is characterized by feelings of tension and is comparable to a state of anxiety. In the face of repeated exposure to uncontrollable outcomes, the reactance phase gives way to a state of helplessness and giving up. This is analogous to depression.

Thus, given that the current investigation examined a sample of university students over a 4-month period (i.e., the first semester of year 1 for most of the students

in this sample) it is possible that what is being captured in the results of this study is perfectionists' *initial* emotional response to stress and failure – this initial response being in the form of anxiety. This initial anxiety response might reflect an individual's dissatisfaction regarding their current situation (e.g., failing an important exam), however the individual might still be motivated to work at changing this situation (e.g., seeking academic assistance, studying more). However, perhaps if this same group of students were followed for a longer period of time, the perfectionism-stress interaction might predict symptoms of anhedonic depression at a later point in time. That is, with continued experience of achievement-related stressors, a perfectionistic individual might begin to lose motivation and confidence that they could change their situation and begin to feel hopeless and depressed.

Limitations of this Research

The results of this study should be considered in light of a number of limitations. First, this investigation utilized a large group of undergraduate university students, and thus the reported results may not necessarily generalize to other groups such as a community population or a clinical population. It is important to note, however, that perfectionism is a personality construct that is highly relevant to university students, and it has been argued that examining constructs related to emotional and psychological adjustment in a university student population is important in its own right (e.g., Halgin & Leahy, 1989). Another potential issue is that the sample of students examined was comprised mostly of White female adults. Different results may be seen for men and for different ethnic groups.

Also, preliminary analyses revealed that there was a significant difference in anhedonic depression scores assessed at the first evaluation between completers and noncompleters, with completers having lower scores than noncompleters. Thus, those individuals with higher reported levels of anhedonic depression at Time 1 were less likely to return to complete the Time 2 session. This finding is understandable – an individual reporting high levels of anhedonic depression at Time 1 may be less likely to return for the Time 2 session because of features related to their depression such as low motivation, fatigue, hopelessness. However, this finding is problematic because it is possible that if these individuals had returned to complete the Time 2 session, significant findings for the prediction of anhedonic depression may have been observed. Again, it is likely that the findings of this investigation capture the early or initial process that occurs when a perfectionistic individual (free from psychopathology) first faces failures or setbacks.

Although the overall design of this investigation was longitudinal, one set of analyses was based on cross-sectional data. In examining the stress enhancement process with the interpersonal event, the number of students endorsing a relationship termination in the 4-month interval between the Time 1 and 2 evaluations was insufficient to appropriately test hypothesized models (i.e., not enough power to detect expected effects). Thus, interpersonal event data collected at the Time 1 evaluation was used (i.e., relationship terminations in the 4-months prior to the Time 1 session). Given that measures of perfectionism, stress, and symptoms were concurrently assessed, causal statements about changes in symptoms over time cannot be made for this set of findings.

Finally, it should be noted that the R^2 change values for the significant interaction effects observed in this investigation were relatively small (.01 - .06). However, previous research examining perfectionism diathesis-stress models in the prediction of symptoms have reported similar sized effects. For example, Hewitt et al. (1996) reported an interaction between SOP and achievement-related stressful life events predicting Time 2 BDI scores that resulted in a R^2 change of .03. Moreover, detecting significant interaction effects in these types of analyses is difficult and such interactions typically account for 1-3% variance (see McClelland & Judd, 1993).

Future Directions of Research

Although the findings of this investigation provide some insight into two hypothesized stress processes linking perfectionism to emotional maladjustment, numerous questions and issues remain. First, though this investigation was longitudinal, it did not address the vulnerability to emotional maladjustment posed by perfectionism over a long period of time. The use of multiple assessments over a longer time period would further elucidate the process by which perfectionists come to experience different forms of emotional maladjustment. As stated above, perhaps over time, perfectionists experience different types of psychopathological symptoms in response to varying types and amounts of stress (e.g., anxiety → mixed anxiety/depression → depression as number or intensity of relevant stressful events increases over time). Moreover, the examination of potential gender and ethnic differences in how perfectionism leads to emotional maladjustment over time is another direction for future research.

Also, this investigation focused on two specific hypothesized stress processes – stress enhancement and stress generation. Hewitt and Flett (2002) describe other stress processes, such as stress anticipation and stress perpetuation, which are in need of further examination and would provide a more comprehensive picture of how perfectionists come to be exposed to and react to stress. In addition, examination of the types of coping styles and strategies associated with perfectionism would shed light on another layer of the perfectionism-stress relationship. To date, several studies have looked at how coping processes influence the relationship between perfectionism and emotional maladjustment (e.g., Hewitt, Flett, & Endler, 1995; O'Connor & O'Connor, 2003). However, there is a need to look more specifically at the kinds of coping strategies perfectionists employ in response to specific kinds of stressors (e.g., achievement vs. interpersonal, appraisals vs. frequency) and whether these coping strategies moderate the effects of stress (e.g., maladaptive coping strategies may exacerbate the effects of stressors, while adaptive coping strategies may buffer the effects of stressors).

Moreover, thus far, research studies that have examined stress processes in perfectionism have relied on self-report measures of stress. Although the current investigation attempted to incorporate elements of the interview-based approach into the use of questionnaires, the most optimal approach to assessing and measuring stress would be to adopt an entirely interview-based approach (e.g., the LEDS approach). This approach would allow for the inclusion of a broader range of contextual information and provide a more rigorous way of minimizing the influence of diathetic biases. Another direction for future research and a method for assessing stress without relying on self-

report is to explore physiological indicators of stress, such as the assessment of cortisol levels pre- and post- stressful events over time.

Finally, an important direction for future research involves the further clarification of how perfectionism is most appropriately conceptualized and measured. To date, much of the research literature has focused on exploring the correlates of different perfectionism dimensions. For example, researchers have reported that maladaptive perfectionism is associated with a variety of negative characteristics (e.g., negative affect, low self-esteem, poor coping) while adaptive perfectionism is associated with positive characteristics (e.g., positive affect, confidence, adaptive coping) (for a review see Stoeber & Otto, 2006). Though the findings of this investigation do not support the notion that the dimension of adaptive perfectionism examined is healthy or positive, it is possible that a truly adaptive form of perfectionism does exist. However, research has not adequately explored what features of perfectionism might confer adaptive versus maladaptive functioning and in what contexts adaptive versus maladaptive functioning may be observed. For example, maladaptive perfectionism may be negative because, at the core, perfectionistic motivations are externally-imposed and upheld because of fears related to others' disapproval and negative evaluation. Thus, these characteristics of maladaptive perfectionism may underlie the unhealthy correlates and outcomes that have been found to be associated with this dimension. Adaptive perfectionism, on the other hand, may be more adaptive because of its ego-syntonic nature but may still have features that may be maladaptive in particular contexts. For example, this study showed that when faced with achievement failures, adaptive

perfectionists did experience greater levels of anxiety. It would be an important advancement in our understanding of perfectionism to elucidate the specific characteristics of perfectionism that contributed to this process. It might be that adaptive perfectionist's tendency to hold to their high standards rigidly and believe that their own self-worth is determined by whether they attain their high standards is important to this process. However, research that is explicitly aimed at elucidating the core characteristics of perfectionism that may underlie positive versus negative outcomes is necessary.

Conclusion

The present study makes a number of contributions to the literature. To my knowledge, this was the first study to explicitly examine the process of perfectionistic stress enhancement using a methodology that distinguished objective and subjective components of stress and focused on specific, relevant stressful events. This investigation provided evidence for the basic stress enhancement process and also showed that stress appraisals were a relevant form of stress that interacted with perfectionism to significantly predict increases in emotional maladjustment (i.e., anxious arousal symptoms).

This investigation also provided some important insights into the process of perfectionistic stress generation. Although perfectionism was associated with greater number of stressful life events experienced over a 4-month interval, this relationship was mediated by general negative affect concurrent to perfectionism. This finding highlights the importance of assessing for and ruling out potential diathetic biases in examining diathesis-stress processes. The present study also showed that the number of stressful life

events interacted with perfectionism to predict emotional maladjustment (i.e., anxious arousal).

In addition, this investigation showed that the dimensions of maladaptive perfectionism and SPP were essentially tapping the same construct, a construct that represented a form of perfectionism that was quite pathological and directly predictive of emotional maladjustment. Adaptive perfectionism and SOP were also found to have a high degree of overlap. These dimensions represented a form of perfectionism that was less pathological, but nonetheless predictive of increases in emotional maladjustment when triggered or activated by relevant stressors. This investigation provides evidence to support the idea that perfectionism is, at its core, maladaptive and associated with negative outcomes. Even so-called "adaptive" perfectionism, when examined from a more contextual perspective, was associated with increased psychopathology.

The findings of this study also have important clinical implications. University is a time of great change and excitement. Students start this new chapter of their lives, eager to learn and develop, both intellectually and socially. However, ironically, some of the most promising, goal-oriented, high-achieving students are also the most vulnerable to the pressures and stressors of university life. The present study found that highly perfectionistic students are at a heightened risk for experiencing significant emotional maladjustment. Perfectionism was found to predict, either directly or indirectly, stress enhancement and stress generation, and in turn these processes predicted specific anxiety symptoms. Without appropriate identification and intervention, these highly perfectionistic students could go on to develop even more serious forms of

psychopathology. Clearly, continued empirical examination of perfectionism in university student populations is important and relevant. Further research elucidating the processes by which perfectionism comes to be associated with psychopathology, as well as the development and evaluation of early identification and treatment protocols targeting perfectionism are necessary.

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Appendix A

Coding Achievement-Related Events: Sample Scenarios

Subject expected to get 85% on the psychology midterm examination. In terms of importance, subject rated this event as a 2 (1=extremely important, 5=not important at all). Subject is planning to do an Honour's Major in Psychology and thus the course is required. Subject's actual mark was 80%. Overall, the course average was 66%.

Short-term threat = 4; Long-term threat = 4.

Subject expected to get 70% on the psychology midterm examination. In terms of importance, subject rated this event as a 1 (1=extremely important, 5=not important at all). The course is an elective. Subject's actual mark was 60%. Overall, the course average was 66%.

Short-term threat = 3; Long-term threat = 4.

Subject expected to get 70% on the psychology midterm examination. In terms of importance, subject rated this event as a 1 (1=extremely important, 5=not important at all). Subject is planning to do an Honour's Major in Psychology and thus the course is required. Subject's actual mark was 35%. Overall, the course average was 66%.

Short-term threat = 2; Long-term threat = 3.

Subject expected to get 75% on the psychology midterm examination. In terms of importance, subject rated this event as a 1 (1=extremely important, 5=not important at all). Subject is planning to do a Major in Psychology and thus the course is required. Subject's actual mark was 51%. Overall, the course average was 66%. Subject currently holds a scholarship which requires an overall average of 80%.

Short-term threat = 2; Long-term threat = 2.

Appendix B

Coding Interpersonally-Related Events: Sample Scenarios

Subject recently experienced the breakup of a romantic relationship. The length of the relationship was 2 months. The subject's partner ended the relationship but the subject expected that the relationship would end. This was not the subject's first romantic relationship. The relationship was sexual. The couple never lived together and had no children. Subject reported that the relationship was a 3 in terms of importance (1= extremely important, 5=not important at all).

Short-term threat = 3; Long-term threat = 4.

Subject recently experienced the breakup of a romantic relationship. The length of the relationship was 40 months. The subject ended the relationship and the termination was expected. This was not the subject's first romantic relationship. The relationship was sexual. The couple lived together (36 months) and had no children. Subject reported that the relationship was a 2 in terms of importance (1= extremely important, 5=not important at all).

Short-term threat = 2; Long-term threat = 3.

Subject recently experienced the breakup of a romantic relationship. The length of the relationship was 36 months. The subject ended the relationship and the termination was expected. This was not the subject's first romantic relationship. The relationship was sexual. The couple lived together (8 months) and had no children. The partner's infidelity/unfaithfulness was involved in the breakup of the relationship. Subject reported that the relationship was a 1 in terms of importance (1= extremely important, 5=not important at all). The subject lost friends as a result of the breakup. The subject also reported a significant reduction in school and/or work responsibilities (e.g., dropped courses; reduced hours worked).

Short-term threat = 1; Long-term threat = 2.