The Relation between Personality Traits and Coping Endorsement: Relevance to Psychological Well Being.

A Thesis submitted to the Department of Psychology and Faculty of Graduate Studies and Research of Carleton University in partial fulfillment of the requirements for the degree of

Master of Science

Psychology

Specialization in Neuroscience.

© Marc Turcotte

Department of Psychology and Institute of Neuroscience

Carleton University (2005)

Your file Votre référence
ISBN: 0-494-00791-5
Our file Notre référence
ISBN: 0-494-00791-5

Abstract

Coping strategies endorsed by individuals may play a significant role in determining whether stressful events associate with the emergence of depression. As considerable variability exists with respect to the stress-coping-depression relationship, the present investigation sought to examine whether personality variables (Big Five Factor Inventory), moderated the effects of coping methods on depressive symptoms in a non-clinical population. Among university students (N = 200), the interactive effects of personality traits and coping endorsement accounted for a proportion of the individual variability in coping related depressive vulnerability. Overall, emotion focused coping strategies were related to increasing depressive symptoms. Heightened scores on the conscientiousness, extraversion and openness to experience domain interacted with the endorsement of these coping strategies, so that the magnitude of the coping-depression relationship was diminished. Conversely, increased scores on the neuroticism domain interacted with the endorsement of emotion focused coping endorsement such that the magnitude of the coping-depression relationship was augmented. Additionally, interactive effects of personality traits and coping endorsement accounted for a proportion of the variability in individual cortisol reactivity to a laboratory stressor. Specifically, increased scores on the openness to experience and conscientiousness domain both independently interacted with the endorsement of emotion focused coping, such that the magnitude of the emotion coping-cortisol reactivity relationship was augmented at 15 and 30 minutes post-stressor respectively. The findings are discussed in terms of the influence of how individual qualities specific to different personalities can alter coping effectiveness, thereby influencing depressive vulnerability.

Acknowledgements

I would like to express my deepest gratitude towards my thesis advisor Dr. Hymie Anisman. Without his endless support, insightful guidance and especially his patience, this thesis would never have been accomplished.

I must also extend many thanks to Alla Skomorovsky and Drs. Kim Matheson and Owen Peter Kelly for their support and understanding throughout. I would also like to thank Dr. Jerzy Kulczycki for his help running the cortisol assays.

I would also like to thank my parents for the moral and financial support they have afforded me throughout these years. Last, but certainly not least, I must thank my beautiful fiancée who has supported me in all aspects imaginable throughout these challenging times.

This work was supported by funds from the Canadian Institutes of Health Research awarded to Drs. Hymie Anisman and Kim Matheson.

Table of Contents

List of Tables

List of Figures

List of Appendices

Introduction

Associations between an individual's response to stressful events and the development or exacerbation of psychological disturbances are well established (Penley, Tomaka & Wiebe, 2002; Somerfield & McCrae, 2000). Of course, marked individual differences exist with respect to the adverse effects of stressors, possibly stemming from numerous factors related to the nature of the stressor, previous stressor experiences, several individual characteristics (Anisman, Hayley, Kelly, Borowski & Merali, 2001; Matheson & Anisman, 2003; Herman & Cullinan, 1997), and the way in which individuals cope with such insults (Lazarus & Folkman, 1984).

Most investigators agree that coping strategies endorsed may contribute to depressive illness in the face of stressors, and that the coping method endorsed is influenced by situation-specific variables, as well as cognitive appraisals of a stressful encounter (Folkman & Lazarus, 1985; Skinner & Brewer, 2002). Not unexpectedly, the endorsement of particular coping strategies, differ greatly among individuals and across situations, but it is uncertain what factors determine which coping strategies are favoured by different individuals. Some researchers suggest that coping strategies are determined by stable individual characteristics, such as personality traits (Connor-Smith & Compas, 2002; Costa, McCrae & Zonderman, 1987), whereas others suggest that stressor reactivity and coping are determined by previous stressful experiences and early life events (Meaney, 2001). Regardless of the theoretical position, the influence of coping on the development or exacerbation of depression has been the basis of considerable empirical research (Bridge et al., 2003; Shahar, Joiner, Zuroff & Blatt, 2004).

The moderating effects of personality traits upon responses to various stressors have been examined. It has been argued that appropriate coping responses, the effects of which are moderated by personality factors, act as buffers to diminish the impact of stressors such as work and stressful life events (Coyne & Whiffen, 1995; Rascle & Irachabal, 2001). It has likewise been suggested that personality traits and coping endorsement affect individual differences in reactivity to stressful encounters, hence affecting the development of symptoms of depression and anxiety (Bolger & Zuckerman, 1995; Connor-Smith & Compas, 2002).

Several investigators have used the five-factor model (FFM; also referred to as the "Big Five") of personality to describe both normal and pathological personality (Reynolds & Clark, 2001). The FFM represents a taxonomy of broad personality dimensions thought to represent the minimum number of traits necessary for adequately describing personality; the classification includes neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (David & Suls, 1999). The FFM also provides a useful context for assessing individual differences in reactivity to stressful encounters (Ratsep, Kallasmaa, Pulver & Gross-Paju, 2000) and coping endorsement (David & Suls, 1999). This approach has led to demonstrations supporting the view that personality traits, predominately neuroticism, can moderate the effectiveness of coping strategies, thereby influencing subsequent associations with depression (Bolger & Zuckerman, 1995). Regardless of such findings, the influence of personality traits upon the endorsement and effectiveness of coping strategies relating to depression has received little empirical attention within the context of a moderator model. The proposed study will further investigate the influence of each personality trait, defined by the FFM, as

moderators of general coping endorsement thereby influencing the association with depression.

In addition to their mood altering effects, stressors typically promote hypothalamic-pituitary adrenocortical (HPA) axis activation as reflected by the secretion of the end-product cortisol from the adrenal cortex (Jessop, 1999). Cortisol molecules act as important mediators of the physiological and behavioural stress response, regulating both basal and stress induced HPA axis activation via tonic inhibitory influences and negative feedback regulation (Jessop, 1999). Although stressors influence cortisol release, there appears to be considerable variability in this respect, possibly reflecting the influence of a wide range of experiential, organismic (e.g., age, genetics) and individual difference characteristics (Anisman & Matheson, 2004). Thus, in the present investigation it was of interest to examine whether personality traits moderate the relationship between coping and post-stressor neuroendocrine reactivity.

Coping and Coping Strategies

Coping has been conceptualized in many ways. Some researchers have taken a trait approach, defining coping as stable and habitual problem-solving thoughts and actions aimed at reducing stress (Penley, Tomaka & Wiebe, 2002). Others have taken a process approach, emphasizing that coping is a transactional phenomenon, which constantly changes so as to meet evolving demands of stressful situations (e.g., Lazarus & Folkman, 1984). These investigators defined coping as the cognitive and behavioural efforts to manage demands appraised as taxing or exceeding the individual's resources. Inherent within this definition is the concept that coping involves active efforts to alter

the stressful situation (i.e., problem-focused coping) along with efforts to regulate the emotional distress associated with the situation (i.e., emotion-focused coping) (Lazarus & Folkman, 1984). A third category, avoidance coping, is partly considered to belong to the latter variety of coping mechanisms (Amirkhan, 1990; Lazarus & Folkman, 1984). Examples of problem-focused coping include seeking information or social support, planning and taking action (Penley et al., 2002). Conversely, emotion-focused coping may involve focusing on the positive, mental or behavioural disengagement, and seeking emotional support (Penley et al., 2002). According to Folkman and Lazarus (1980), people use both problem-focused and emotion-focused coping in most stressful situations. As such, their individual effects can be difficult to dissociate. For instance, emotion-focused coping may alter problem-focused efforts by attenuating or exacerbating feelings of distress. Likewise, problem-focused coping can render the stressor less threatening, thereby diminishing distressing emotions (Carver & Scheier, 1994).

As alluded to earlier, individual appraisals or preferences for certain coping styles account for a portion of the inter-individual variation in coping skill acquisition (Stowell, Kiecolt-Glaser & Glaser, 2001). Appraisals, defined as the cognitive interpretation one has regarding a potential stressor (Lazarus & Folkman, 1984), develop through cognitive processes and learned experiences about the world and one's self (Lazarus & Folkman, 1984). Likewise, one's preferred coping strategies are influenced by both situational (e.g., changeability, controllability) (Folkman and Lazarus, 1980) and dispositional factors (e.g., personality, attitudes, self-confidence) (Carver, Scheier & Weintraub, 1989). Lastly, as certain coping strategies are likely to co-occur, the apparent effectiveness of dealing with a stressor may actually reflect a combination of coping strategies endorsed

(Matheson & Anisman, 2003). Therefore, knowing how an individual copes with stressors in general, particularly when coping strategies are assessed independently of one another, may reveal very little about how he or she will cope in any specific stressful event.

Appraisals and Coping Responses

Lazarus and Folkman (1984) argued that coping with a stressful situation is primarily determined by appraisals concerning the situation, leading to coping responses and adjustments. Several different aspects of appraisals have been examined, including the perceived stress, control, threat, and challenge associated with a given event or situation (Carver & Scheier, 1994; Jimmieson, Terry & Callan, 2004; Pape & Arias, 1995). Lazarus and Folkman (1984) have also distinguished between primary and secondary appraisals. In general, primary appraisal defines a set of cognitions concerning the personal significance of the stressful encounter (e.g., "Is this situation a threat to my well-being?"), whereas secondary appraisal refers to a set of cognitions regarding the defences or resources available to effectively manage the situation (e.g., "Will the skills I have to cope with this problem be sufficient?"). Consistent with this view, researchers have identified associations between stress-related appraisals and various coping strategies.

Impact of Appraisals on Coping Endorsement

According to Folkman, Lazarus, Dunkel-Schetter, Delongis and Gruen (1986), individual appraisals of stressful events impact the choice of coping strategies that are utilized. Thus, the selection of coping efforts ought to be predictable from cognitive appraisals. For instance, if an individual appraises his or her resources and abilities to manage a stressful situation effectively (i.e., secondary appraisal) relative to the perceived danger of the stressor (i.e., primary appraisal), the situation will be perceived as controllable. Consequently, the individual should resort to problem-focused coping, such as planful problem solving. Conversely, if the resources to cope with a stressful situation were appraised as low relative to the appraised danger of the stressor, the situation would be seen as uncontrollable. In this instance, emotion-focused coping such as distancing/avoidance or emotional expression should predominate (Folkman et al., 1986; Lazarus, 1993). This process has been identified as the goodness of fit model and is thought to be intrinsic to Lazarus and Folkman's (1984) stress model (Vitaliano, DeWolfe, Maiuro, Russo & Katon, 1990).

Many assessments of the goodness of fit hypothesis have found that problem-focused coping is more adaptive than emotion-focused coping in situations appraised as controllable (Zakowski, Hall, Klein, & Baum, 2001; Terry & Hynes, 1998). Conversely, little support exists for the notion that emotion-focused coping may be more adaptive in situations appraised as uncontrollable (e.g., Christensen, Benotsch, Wiebe & Lawton, 1995). For instance, Stone and Neale (1984) found positive associations between stressful events appraised as undesirable (e.g., problems at work) and seeking social support (emotion-focused coping). Additionally, Terry (1994) found that instrumental action (i.e.,

problem-focused coping) was more likely to be used when the situation was appraised as being controllable, whereas minimization and escapism (i.e., emotion-focused coping) were more frequently used when the event created perceptions of threat and vulnerability.

Individual Differences: "Big Five" Personality

Trait models of personality are common in the psychology literature, but the big five-factor model has received particular attention (Lawrence & Fauerbach, 2003). As mentioned earlier, the FFM represents a framework that offers a comprehensive basis for the taxonomy of human personality (David & Suls, 1999). Structurally, the FFM is ordered hierarchically. The five broad personality domains, which constitute the top of the hierarchy, include neuroticism, extraversion, agreeableness and conscientiousness, and openness to experience (David & Suls, 1999). Each of these domains integrates a number of lower-order traits or facets (Vollrath, 2001), which may be used for specific predictions within various situations (Vollrath, 2001). Furthermore, the FFM has been shown to be consistent across different theoretical frameworks, assessment instruments and ratings from different sources (Paunonen, 2003; Trull & Geary, 1997).

Not only have the domains been objectively characterized, associations with psychological well-being have also been demonstrated. For instance, neuroticism is the tendency to experience negative affects such as fear, embarrassment and guilt (Rector, Hood, Richter & Bagby, 2002). According to Costa and McCrae (1985), highly neurotic individuals are prone to irrational cognitions, are less able to manage impulses, blame themselves but also lash out at others and endorse maladaptive coping in stressful situations. Additionally, neuroticism has consistently been associated with depression

(Farmer, et al., 2002), possibly mediated by affective reactions to stressors, differences in hypothalamic-pituitary-adrenal axis regulation, or employment of maladaptive coping strategies (Lawrence & Fauerbach, 2003).

Extraversion is characterized by sociability, cheerfulness, and energy. As such, highly extraverted individuals are assertive, active and talkative (Lawrence & Fauerbach, 2003). Watson and Clark (1997) infer that the high energy and activity level of extraverted individuals accounts for the consistently demonstrated associations with problem-focused coping endorsement during stressful situations. Furthermore, lower levels of extraversion have been associated with higher scores on a self-rated depression inventory (i.e., Beck Depression Inventory (BDI)) (Enns, Larsen & Cox, 2000), implying that extraversion may protect against depression.

Openness to experience is the domain characterized by intellectual curiosity, a preference for variety, aesthetic sensitivity and a higher level of cognitive flexibility in stressful encounters (Lawrence & Fauerbach, 2003). As such, highly open individuals will actively seek new information, perspectives and solutions to manage stressful situations (Lawrence & Fauerbach, 2003). Regardless of such characteristics, research has demonstrated significant positive associations between this domain and avoidance coping among a sample of university students (Brebner, 2001). Others have demonstrated results associating openness to experience with depression. Carrillo, Rojo, Sanchez-Bernardos, and Avia (2001) have established that separate openness facets differentially predict depression. Specifically, while the openness to action facet of this domain significantly predicted low depression scores, the openness to fantasy facet significantly predicted high scores on the BDI (Carrillo et al., 2001). Parenthetically, it was also found

that among middle school students the agreeableness and openness to experience domain predicted later academic success, adjustment and behavioural conduct, well above what can be predicted from gender, ethnicity and current grade (Hair & Graziano, 2003).

Conscientiousness is characterized by a strict adherence to principles and a desire to achieve goals (Lawrence and Fauerbach 2003). Highly conscientious individuals plan and organize tasks and are persistent in seeking personal growth during stressful situations (Brebner, 2001). Many investigators believe that these characteristics contribute to the determination of happiness and well-being by enabling effective functioning in society and achievement of pursued goals, thereby leading to greater subjective well-being (DeNeve & Cooper, 1998; Hayes & Joseph, 2003).

Finally, agreeableness incorporates trust, altruism and empathy (Lawrence & Fauerbach, 2003), and these individuals are impassive and compliant when dealing with stressful situations (Brebner, 2001). Harkness, Bagby, Joffe and Levitt (2002) indicated that individuals suffering from a combination major depression and chronic minor depression exhibit particularly high trait anxiety and lower agreeableness scores. Such a profile may define a group that is pessimistic, disaffected and frustrated because they personalize their disease as intractable and enduring (Harkness, et al., 2002), thereby conforming to the disease.

Taken together, it seems that personality characteristics impact upon various aspects of the stress response (Lawrence & Fauerbach, 2003), and may thus account for some of the inter-individual variability so often encountered in stress-coping research. As such, individual or dispositional characteristics ought to be considered in order to develop

a more comprehensive understanding of the stress-illness topography (David & Suls, 1999).

Impact of Dispositional Influences on Coping Endorsement

It has been maintained that stable individual dispositions influence coping strategies, irrespective of the situation. In this regard, Holahan and Moos (1987) showed that a significant proportion of variance in coping responses was accounted for by initial measures of coping assessed one year earlier. Temporal stability of coping efforts was also evident across a 7-year longitudinal study, suggesting that enduring characteristics of the individual are (in part) determinants of coping strategy utilization (McCrae, 1989). Personality traits, which are known to be stable over time, may also exert stable influences on coping efforts (Carver et al., 1989). For instance, highly neurotic individuals (i.e., those whom chronically experience distressing emotions) focus on the associated level of distress rather than on engaging in goal-directed behaviour. Consistent with this view, among patients suffering from multiple sclerosis-related distress, neuroticism correlated with emotion-focused coping (Ratsep et al., 2000). In a similar fashion, it was reported that during marital distress, highly neurotic individuals relied more heavily on avoidant coping efforts when compared to individuals assessed as being low on the neuroticism domain (Bouchard, 2003). Significant associations were also found between the openness to experience domain and planful problem solving strategies. In effect, it was suggested that individuals open to experiences are more willing to consider the problem from different perspectives and adopt new, more adaptive coping efforts (Bouchard, 2003).

As already indicated, coping is thought to reflect a dynamic process, and the nature of the coping methods endorsed will be dependent on situational and experiential factors, and may also be affected by personality variables. Such an outcome could emerge owing to dispositional factors directly impacting coping. For instance, in a study investigating the factors related to coping endorsement in the context of marital difficulties, it was demonstrated that neuroticism shared a significant positive association with the utilization of avoidance coping strategies regardless of gender. This was in line with expectations as highly neurotic individuals are likely to experience distressing emotions when faced with conflict. As such, the easiest and most efficient way of reducing such distressing emotions is to escape from the stressful encounter (Bouchard, 2003).

Differential Influences of Personality Traits Upon Coping Endorsement

Personality traits have been shown to influence coping effectiveness (i.e., the extent to which coping reduces the negative outcomes of stressful encounters). Bolger and Zuckerman (1995) demonstrated that two coping methods (i.e., self-controlling vs. escape-avoidance coping) had different effects when endorsed by high vs. low-neurotic participants. Specifically, efforts to exert self-control were effective in preventing depression in low-neurotic individuals, while an opposite effect was demonstrated in the high-neuroticism condition. While escape/avoidance coping was unrelated to depression in the high-neuroticism group, it predicted depressogenesis in the low-neuroticism group (Bolger & Zuckerman, 1995). Such results demonstrate that certain personality traits could predispose individuals to cope in certain ways when confronted with adversity, and

that detrimental effects on psychological well-being could be attributed in part to such dispositional characteristics.

Rather than having a direct impact on coping, dispositions may affect the stressor appraisal processes, which then comes to influence coping methods. For instance, Penley and Tomaka (2002) demonstrated that individuals assessed as neurotic perceived a public speaking task as highly stressful (i.e., primary appraisal). Furthermore, their abilities to cope with the challenges related to the task (i.e., secondary appraisal) were perceived as insufficient. Conversely, the task was appraised as non-stressful, and coping ability perceived as sufficient within subjects identified as extroverted, open to experience or conscientious. With regards to coping endorsement, highly neurotic individuals consistently seek emotional support, and cognitively minimize the severity of the situation (emotion-focused coping).

In contrast to the effects related to neuroticism, individuals identified as highly open to experience or highly conscientious, consistently endorsed active efforts including planning for and engaging in tasks directly geared towards reducing the stressor effects (Penley & Tomaka, 202). Similar results have been reported using self-report questionnaires as opposed to acute laboratory stressors. Among other measures, dispositional and situational coping was assessed in undergraduate students via the 60-item COPE (Carver & Scheier, 1994), and the Ways of Coping Questionnaire (Folkman & Lazarus, 1988c) respectively, while the NEO five-factor inventory (Costa & McCrae, 1985) was used to assess personality characteristics (Bouchard, Guillemette and Landry-Leger, 2004). Highly neurotic individuals relied on emotion-focused over problem-focused coping strategies when faced with daily stressors. Students assessed as highly

conscientious, in contrast, endorsed problem-focused coping strategies when confronted with stressful events. It was suggested that since competence, order and careful planning define highly conscientious individuals, they rarely face situations where the external demands (i.e., primary appraisals) exceed their perceived resources (i.e., secondary appraisals). These findings were consistent with earlier work (Gunthert, Cohen and Armeli, 1999) where it was supposed that highly neurotic individuals tend to cope poorly in general, and base secondary appraisals on past, unsuccessful coping experiences. Additionally, highly neurotic subjects have a negative self-evaluative bias and thus perceive themselves as less able to deal with stressful encounters (Gunthert et al., 1999). Taken together, it seems that individuals characterized by particular personality traits consistently endorse specific coping styles across a variety of stressful encounters. As such, dispositional factors, such as personality traits, can directly influence the response to stressful encounters, either by directly influencing coping endorsement or effectiveness, or indirectly by influencing cognitive appraisals of the situation.

Appraisals, Coping and Well-Being

According to the Goodness of Fit hypothesis, individuals in whom there is a match between their coping and their appraisals would be less likely to become distressed than those who mismatch their coping efforts with their perceptions (Vitaliano, et al., 1990). The goodness of fit model postulates that situations appraised as controllable may be more efficiently dealt with by coping strategies aimed at resolving the problem itself. Such problem-focused coping would be ineffective and possibly harmful in the face of an uncontrollable stressor where little to nothing can be done. Conversely, in situations

appraised as uncontrollable, emotion-focused coping may best reduce distress as ones internal state may be more amendable to change than the situation itself (Zakowski et al., 2001). In line with this position, Zakowski et al. (2001) demonstrated that appraisals significantly predicted type of coping, such that greater perceived control was associated with more problem-focused coping and with less self-blame, wishful thinking and avoidance. Furthermore, individuals that appraised their level of control as being low, and who endorsed more emotion-focused coping, were more likely to exhibit low levels of psychological distress (i.e., depression). Less psychological distress was also associated with individuals who perceived a high level of control accompanied by less emotion-focused coping (Zakowski, et al., 2001). Recently, Park, Armeli and Tennen (2004) demonstrated that problem-focused coping shared a stronger positive association with mood when dealing with controllable vs. uncontrollable stressors. While various coping styles have been associated with clinically relevant psychopathology (e.g., depression and PTSD), it was generally observed that problem-focused coping was associated with attenuation of symptoms, while emotion-focused coping shared positive associations with symptomatology (McCabe, McKern & McDonald, 2004; Ravindran et al., 1999; Vollrath, Alnaes & Torgersen, 1996).

Neuroendocrine Reactivity to Stressful Encounters

Stressful life events generally provoke a cascade of neuroendocrine reactions, including those involved in hypothalamic-pituitary-adrenal (HPA) axis functioning (Sapolsky, Romero & Munck, 2000). As in the case of the mood changes, however, in response to stressors (including those of a psychological, physical or systemic nature)

marked inter-individual differences have been reported (Anisman & Matheson, 2004). Essentially, post-stressor neuroendocrine activity involves the release of corticotropin-releasing hormone (CRH) from the median eminence of the paraventricular nucleus of the hypothalamus (PVN), which then stimulates the anterior pituitary gland to secrete adrenocorticotropic hormone (ACTH) into general circulation, ultimately stimulating cortisol release from the adrenal cortex (Sapolsky et al., 2000). Once released into circulation, cortisol affects several organ systems, thereby influencing among other things immunity, inflammation, metabolism, neural function, reproduction and behaviour (Saplosky et al 2000). The neurophysiological stress response can be adaptive when dealing with acute stressful encounters. However, failure to terminate this response, which among other things, may be due to HPA axis dysfunction or exposure to chronic stressors, can result in inappropriately elevated secretion of glucocorticoids, which may result in immunosuppression and psychiatric disorders (Jessop, 1999) and may contribute to hippocampal cell loss (McEwen, 2002). Given the individual differences in the HPA response to stressors, it was of interest to examine whether personality traits moderate coping endorsement, thereby influencing the relationship between coping and post-stressor cortisol reactivity.

Moderator-Interaction Effect of Personality and Coping upon Depressogenesis

Moderator effects have been shown to influence various associations with depression. Such interactions include gender and neuroticism, cognitive functioning and neuroticism, and fantasy and extroversion (Goodwin & Gotlib, 2004; van den Heuvel, Smits, Deeg & Beekman, 1996; Wolfenstein & Trull, 1997). Others have demonstrated

that significant interactions between dependant personality traits and interpersonal stress accounted for positive associations with psychological distress (i.e., depression). For instance, Priel and Shahar, (2000) demonstrated that highly dependent subjects reported greater depressive symptoms in situations perceived as highly stressful. Such an association was absent when the perceived level of interpersonal stress was low. As mentioned earlier, certain personality characteristics may predispose individual's to cope in particular ways when presented with adversity. For instance, McCrae and Costa (1986) have demonstrated that neuroticism was associated with increased use of hostile reaction, escapist fantasy and self-blame, while extraversion was associated with the use of rational action, positive thinking and restraint. Additionally, it has been demonstrated that such associations hold true across various stressor situations (Bouchard et al., 2004; Gunthert et al., 1999; Penley & Tomaka, 2002).

Goals of the present investigation

While it was shown that certain coping styles predominate in certain pathologies such as depression (Matheson & Anisman, 2003), there is a fundamental lack of research examining the moderating effects of personality domains (defined by the FFI) on coping processes (Bosworth, Feaganes, Vitaliano, Mark & Siegler, 2001). The goal of this was to determine (a) how coping endorsement (i.e., self-reported past stressful life events) correlate with depression in a sample of undergraduate students, (b) the associations between personality domains (assessed with the FFI) and the incidence of depression, and (c) the moderating effects of personality traits upon coping dimensions in both the

context of depressive symptoms, as well as in the context of post-stressor cortisol reactivity.

Expectations and Hypotheses

In line with the goals of the present investigation, it was hypothesized that: a) increased endorsement of emotion-focused coping and decreased endorsement of problem-focused coping strategies would predict increasing depression scores measured on the BDI; b) certain personality traits, conscientiousness, agreeableness, openness to experience and extraversion in particular, would associate with lower BDI scores while neuroticism however, would predict increasing depression measured with the BDI; c) certain personality traits are expected to interact with coping endorsement so as to influence the relationship between stress-coping and depression or post-stressor cortisol reactivity.

Neurotic individuals are characterized by negative self-evaluative biases (i.e., irrational cognitions), blame themselves but also lash out at others, and endorse maladaptive coping in stressful situations (Costa & McCrae, 1985). As maladaptive coping seems to predominate in some pathological states (Matheson & Anisman, 2003), a significant positive association between scores on this personality domain and the incidence of depression is expected. Level of neuroticism is also expected to moderate the positive association between maladaptive coping strategies (e.g., cognitive distraction, emotional expression, other and self-blame, passive resignation, emotional containment and rumination (Matheson & Anisman, 2003)) and depression (BDI score).

Specifically, as level of neuroticism increases, an accompanying increase in the magnitude of the association between maladaptive coping and depression is expected.

Extraverted individuals are characterized by increased sociability, assertiveness and goal-directed activities (Lawrence & Fauerbach, 2003). Extraverts are thus hypothesized to have a larger social support network and be more active when confronted by adversity. During stressful encounters (e.g., negative life events), social support has been shown to buffer against the development of mental disorders (Dalgard, Bjork & Tambs, 1995), thus extraversion is expected to negatively associate with depression. Accordingly, it is expected that this personality domain will interact with problem-focused coping strategies, thereby attenuating associations with depression. Specifically, higher levels of extraversion will predict a greater reliance on adaptive coping strategies including seeking social support, cognitive restructuring, active distraction and humour, thereby increasing the magnitude of the negative association with depression.

Conversely, as individuals identified as open to experiences are characterized by a willingness to consider different perspectives of a challenge (Lawrence & Fauerbach, 2003), a negative association with depression is expected. Additionally, an interaction between openness to experience and coping endorsement is expected, as these individuals are more willing to adopt new, more adaptive coping styles (Lawrence & Fauerbach, 2003). Although contradictory evidence regarding associations between openness to experience and depression exists (Carrillo et al., 2001), it is expected that higher scores on this domain will predict the reliance on a greater variety of coping strategies accounting (in part) for lower depression scores.

Agreeable individuals are characterized by a heightened sense of trust and altruism, compliance and impassiveness (Lawrence & Fauerbach, 2003). In line with previous research, highly agreeable individuals are hypothesized to endorse active coping strategies thereby protecting against depressive illness (Harkness et al., 2002). As indicated earlier, low agreeableness scores are among the defining characteristic of individuals suffering from both major depressive disorder and chronic minor depression (Harkness, et al., 2002). Therefore, it is expected that an interaction between agreeableness and emotion-focused coping may substantially decrease the association between coping endorsement and depression.

Highly conscientious individuals are characterized by competence, order and a desire to achieve goals (Lawrence and Fauerbach 2003). As such, these individuals will spend a great amount of their time and energy sustaining an organized environment and maintaining control, thereby avoiding uncontrollable, stressful situations (Brebner, 2001). During stressful situations, high levels of conscientiousness are expected to correlate with active coping such as problem solving, so as to regain order in stressful encounters. Such characteristics may contribute to the determination of happiness and well-being (DeNeve & Cooper, 1998; Hayes & Joseph, 2002), thus negative associations between this domain and depression are expected. High scores on this domain are expected to interact with the endorsement of active coping, thereby increasing negative associations with depression.

While HPA axis dysfunction may be a precursor as opposed to a consequence of depressive illness (Paykel, 2001), and as cortisol reactivity has been related to how individuals cope with stressful events, the possibility exists that personality traits can moderate coping endorsement, thereby influencing the post-stressor cortisol reactivity.

Based on the defining characteristics of highly neurotic individuals, as described earlier, it is expected that emotion focused coping dimensions will be associated with dysfunctional cortisol reactivity (i.e., either increased or blunted post-stressor cortisol reactivity). Furthermore, it is hypothesized that neuroticism will act as a vulnerability factor for dysfunctional HPA axis activity following a laboratory stressor. Again, for individuals who score high in either the conscientiousness, openness to experience, agreeableness or extraversion domain, it is expected that emotion focused coping dimensions will be less strongly associated with dysfunctional cortisol reactivity. In effect, it is hypothesized that these personality traits may act as a buffer against dysfunctional cortisol reactivity secondary to the endorsement of emotion focused coping dimensions.

Methods

Participants

Participants were contacted through sign-up sheets, telephoned or emailed, and invited to participate in a study concerning personality variables, coping and psychological well-being. Participants comprised 67 males (*M* age = 21.16, *SD* = 6.21) and 133 females (*M* age = 19.58, *SD* = 3.55), and based on the responses of those reporting racial background, this sample was 67.6% (n=177) Caucasian, 7.5% Middle-Eastern (n=13), 9.2% Black (n=16), 8.7% Asian (n = 15), and 6.9% East Asian (n=12).

Procedures

After written informed consent was obtained, participants were asked to relax for 10 minutes to permit habituation to the environment. Following the relaxation period, the participants responded to the Beck Depression Inventory (BDI; Beck & Beck, 1972). Following the BDI, participants were asked to relax for an additional 10 minutes prior to commencing the next stage of the experiment.

Following this second relaxation period, participants were informed that they would be viewing a series of photographs. Using a laptop monitor, they viewed a sequence of five images obtained from the International Affective Picture System, each of which portrayed a potentially traumatic event (e.g., elderly male whose spouse appears to be terminally ill (#2205); a woman who has been severely beaten (#3181); a child who has been seriously injured (#3301); a couple grieving in front of a gravestone (#9220); and finally, a serious motor vehicle accident (#9910)). Each image was viewed for 2 minutes, totalling 10 viewing minutes. To better assess the impact of the images on

neuroendocrine activity, a subset of participants (n = 20) were not presented the images and were asked to relax for an equivalent amount of time. While viewing each picture, participants were asked to appraise and describe their emotional state using a 4-point Likert scale extracted from Matheson and Anisman's (2003) Survey of Coping Profile Endorsement-Abbreviated (i.e., how happy vs. how sad the picture makes them feel). These particular photographs were chosen in hopes that one or more may hold personal meaning to the participant being tested, thereby influencing one's physiological stress response as indicated by post-stressor salivary cortisol levels. Following the presentation of images, each participant was asked to relax for 10 minutes. Once this relaxation period had elapsed, each participant completed the Big Five-Factor Inventory (John, Donahue & Kentle, 1991) and the full SCOPE (Matheson & Anisman 2003). Following these questionnaires, the participants were invited to view a series of 5 positive images in order to attenuate any negative feelings arising from the traumatic images. Finally, participants were provided with both written and verbal debriefing.

Salivary Cortisol

Saliva samples were obtained by having participants chew on a piece of dental cotton for a 2 minute period. The cotton was then removed and placed in a plastic test tube (Salivette™). This was done on five occasions: following the initial relaxation period, just prior to presentation of the images (i.e. following completion of the BDI), immediately following presentation of the images (or equivalent relaxation period), and again 15 and 30 minutes later. All saliva samples were then stored at –80°C until subsequent cortisol determinations. Salivary cortisol levels were determined, in

duplicate, by means of a solid phase radio-immuno assay using ^{125}I kits obtained from ICN Biomedicals Inc., CA. The intra-assay variability was less than 10%, and all cortisol determinations were conducted within a single day to preclude inter-assay variability.

Measures

Beck Depression Inventory (BDI) (21-item version, Beck & Beck, 1972) is a widely used psychometrically sound self-administered questionnaire to assess the intensity of depression in clinical and normal individuals. It has a moderate correlation with both the Hamilton Rating Scale for Depression (HAM-D) and the Montgomery-Asberg Depression Rating Scale (MADRS). On the basis of the total score obtained on the BDI, participants can be classified into the following categories; moderate depressive symptoms (19 and above), mild depressive symptoms (10 to 18) and finally, non-depressed (9 and below) (Beck & Steer, 1987).

Big Five Inventory (BFI) (John, Donahue & Kentle, 1991) is a 44-item 5-point Likert scale questionnaire designed to measure personality based on the big-five classification system. The personality domains assessed include extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Participants rated their agreement with 44 short phrases reflecting archetypal traits related to each of the Big Five dimensions (e.g., "Is talkative") where 1 = disagree strongly, and 5 = agree strongly. Items from each dimension were averaged to form five separate subscales for each participant (e.g., extraversion mean). Psychometric properties of the BFI are well

established and have been discussed extensively (Benet-Martinez & John, 1998; John et al., 1991; John & Srivastava, 1999).

Survey of Coping Profile Endorsement (SCOPE) (Matheson & Anisman, 2003) evaluates 12 coping strategies including problem-solving, cognitive restructuring, active distraction, cognitive distraction, rumination, humour, social support seeking, emotional expression, other-blame, self-blame, emotional containment, and passive resignation. Participants indicate their endorsement of whether they had demonstrated each of the behaviours as a way of dealing with stressors in general using a scale of 0 (Never) to 3 (Frequently). Scores for each of the 12 strategies are obtained by taking the average score of the items that comprised each strategy.

Coping Strategies Endorsed as a Group: Factor Structure of the SCOPE.

Coping strategies were grouped based on common underlying constructs in order to reduced the large number of independent variables through identification of common variance. In accordance with Lazarus and Folkman's (1984) widely accepted transactional model, coping strategies can be classified as either problem or emotion-focused. As such, a principal components analysis including a varimax rotation of the component matrix was conducted to examine which coping strategies identified by the SCOPE formed a group representing either problem or emotion focused coping dimensions. In order to be considered a meaningful factor, a component must have an Eigenvalue over 1.0 and account for at least 10% of the cumulative variance explained. Using these criteria, 3 factors explaining 51.4% of the total variance were extracted. Following a varimax rotation, coping strategies that loaded greater than (or equal to) .45

were identified as a constituent subscale within of the factor. The first factor was identified as the problem-focused coping dimension, comprising problem solving, cognitive restructuring, active distraction and humour. Factor 2 was identified as emotional approach coping dimension comprising rumination, emotional expression, other-blame and self-blame. Lastly, Factor 3 was identified as an emotional avoidance coping dimension comprising low social support seeking (negative loading value), emotional containment and passive resignation. Unit weighting and averaging of the relevant strategies determined scores on each of the three dimensions. This facture structure is consistent with that previously reported using the SCOPE (e.g., Matheson & Cole, 2004).

Results

Descriptives Statistics and Correlations:

Prior to evaluating the possible moderating effects of personality traits and coping endorsement upon depressive symptomatology, descriptive statistics were calculated for the assessed variables (i.e., distress appraisal, depression, coping dimension endorsement and personality trait scores; see Table 1). Also, correlations with depression scores (i.e., BDI scores) and coping dimension endorsement were evaluated in relation to traumatic photograph distress appraisal scores (one for each of the five traumatic photographs) among the participants in this study (see Table 2).

Insert Table 1 here

Table 1.

Descriptive Statistics

	M	S	N
Traumatic Photographs			
Elderly man whose spouse appears to be terminally ill.	2.22	.74	176
A woman who has been severely beaten.	2.36	.74	176
A child who has been seriously injured.	2.76	.52	176
A couple grieving in front of a grave stone.	1.95	.89	176
A serious motor vehicle accident.	2.21	.85	176
Personality Traits			
Openness to Experience (n = 200)	3.50	.66	200
Conscientiousness (n = 200)	3.51	.59	200
Extraversion (n = 200)	3.30	.80	200
Agreeableness (n = 200)	3.74	.58	200
Neuroticism (n = 200)	3.11	.83	200
Coping Dimensions			
Problem-focused	1.78	.51	200
Emotionally-applied	1.51	.51	200
Emotionally-avoidant	.36	.53	200
Depression (BDI scores)	9.18	6.55	200

Table 2.

Standard Regression Analyses: Correlations (r).

	Depression	**Coping Dimensions**		
		Problem Focused	Emotional Approach	Emotional Avoidance
Traumatic Photograph Distress Appraisals.				
Elderly man whose spouse Appears to be terminally ill.	-.047	-.071	.064	-.117
A woman who has been severely beaten.	.049	.012	.015	-.049
A child who has been seriously injured.	.009	.044	.027	-.078
A couple grieving in front of a gravestone.	.062	-.030	.189**	-.111
A serious motor vehicle accident.	-.109	-.098	.007	-.138*

* p<.05; ** p <.01; *** p <.001

Coping Endorsement and Depressive Symptoms:

As previously discussed, certain coping strategies seem to predominate in specific pathological states such as depression. For instance, symptoms of depression have been associated with excessive use of emotion-focused coping combined with diminished endorsement of problem-focused coping. As such, an initial step was to confirm that scores on the BDI correlated with responses on the 12 items comprising the SCOPE. In order to demonstrate this, BDI scores were regressed onto scores for each of the 12 coping strategies comprising the 46-item SCOPE. This analysis indicated that symptoms of depression were related to the 12 coping strategies endorsed on the SCOPE, $R^2 = .324$, $F(12, 199) = 7.50$, $p < .001$. Furthermore, greater endorsement of emotional expression ($B = .20, p < .05$) and self blame ($B = .30, p < .05$), and reduced endorsement of cognitive restructuring ($B = -.19, p<.05$) and active distraction ($B = -.22, p < .05$) were uniquely related to symptoms of depression.

In order to determine whether the endorsement of particular coping strategies varied in relation to symptoms of depression, a mixed measures ANOVA was employed in which the 12 coping strategies derived from the SCOPE were treated as the within-subjects measure and depression group based on BDI scores (non depressed, mildly, and moderately depressed) as the between-subjects variable. While the main effect of coping, $F(11, 2178) = 48.08$ $p<.001$, $\eta^2 = .20$, was significant, these responses were moderated by depression scores, $F(11, 2178) = 9.80$ $p<.001$, $\eta^2 = .047$, as demonstrated in Figure 1[1]. To determine whether individuals reporting heightened symptoms of depression demonstrated greater endorsement of emotion-focused coping strategies and decreased

[1] Between-subjects factor were analyzed as a categorical variable to provide the reader with a visual representation of the significant effects.

endorsement of problem-focused coping strategies, pairwise comparisons (i.e., Tukey test) were conducted for each coping strategy. As expected, coping strategies were found to differ as a function of the depression severity. In particular, non-depressed participants endorsed greater active distraction ($p < .001$) coupled with significantly less rumination ($p < .05$) less self-blame ($p < .001$) and less other blame ($p < .05$) as compared to mildly depressed participants (see Figure 1). Moderately depressed participants significantly endorsed greater rumination ($p < .05$), emotional expression ($p < .05$) and self blame ($p < .001$) as compared to non-depressed participants (see figure 1). No significant differences were found between mildly and moderately depressed participants regarding coping endorsement within this study.

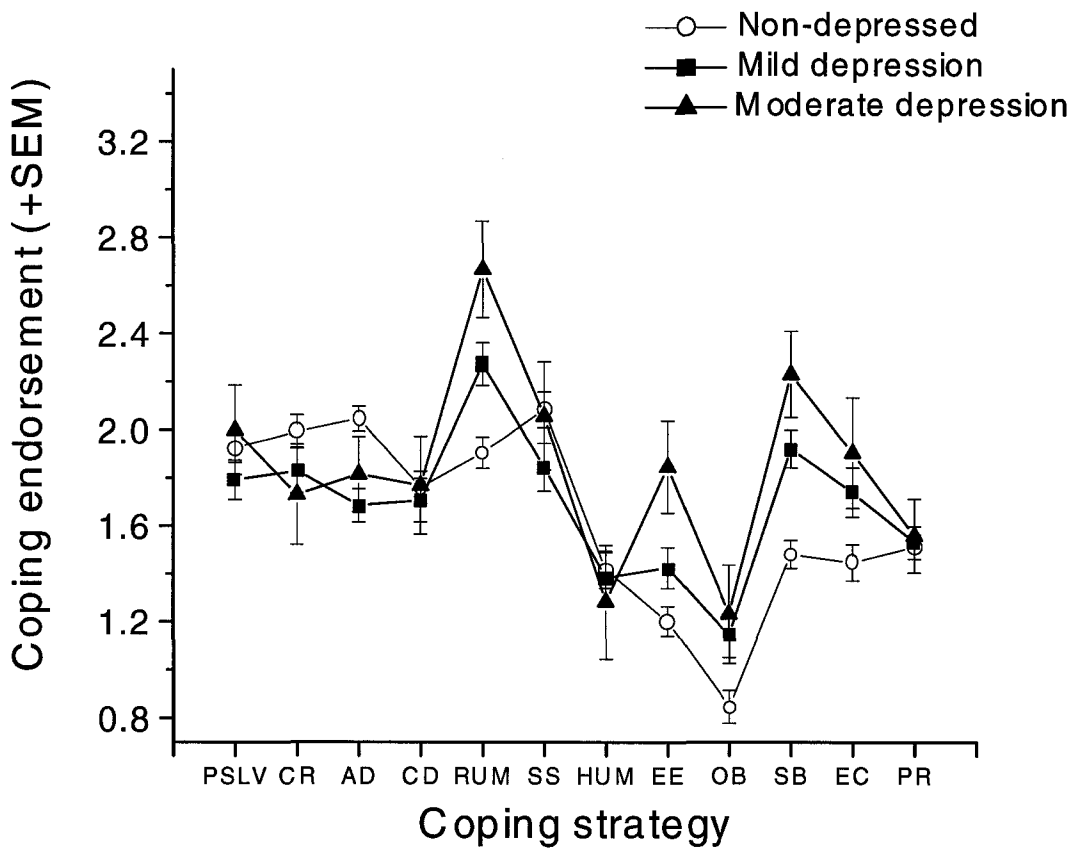

Figure 1: Coping strategies of university students as a function of depressive symptomatology. Note. PSLV = problem solving, CR = cognitive restructuring, ADIS = active distraction, CDIS = cognitive distraction, RUM = rumination, SS = social support seeking, HUM = humour, EE = emotional containment, OB = other blame, SB = self blame, EC = emotional containment, and PR = passive resignation. Moderate depression was defined as a BDI score equal to or above 19, mild depression reflected BDI scores of 10 to 18, while non-depressed participants were defined as those with BDI scores at or below 9.

Distress Appraisals: Relation to Coping Dimension Endorsement.

In line with Lazarus and Folkman's (1984) stress-coping model, individual appraisals of stressful events may influence the choice of coping strategies endorsed. Few studies, however, have actually examined the relationship between primary and secondary appraisals and coping endorsement. Thus, it was of interest to examine whether coping dimension endorsement could be predicted from distress appraisals of the stimulus photographs depicting a potentially traumatic event. In order to establish whether the endorsement of particular coping dimensions were related to distress appraisals, a standard regression analysis was conducted where distress appraisal score was entered as the dependant variable, while the 3 coping dimensions (described earlier) were treated as the independent variables. As each participant viewed five traumatic photographs, the standard regression analysis was conducted five times, once for each distress appraisal score obtained. These analyses indicate that while there were no significant relationships between coping endorsement and distress appraisal scores pertaining to photographs depicting an elderly male whose spouse appears to be terminally ill, a woman who has been severely beaten, a child who has been seriously injured, or a serious motor vehicle accident, the endorsement of the emotional approach coping dimension was related to increasing distress appraisal scores pertaining to a couple grieving in front of a gravestone (see Table 3). However, such a small R^2 value indicates that the regression model does not fit the data well and as such, the meaningfulness of such a significant value is questionable.

Table 3.

Standard Regression Analyses: The Relationship Between Traumatic Photograph Distress Appraisal and Coping Endorsement.

		Distress Appraisals		
	R^2	F	r	β
Elderly male whose spouse appears to be terminally ill				
Coping Dimension Endorsement	.026	1.50		
Problem focused (PFC)			-.071	-.080
Emotional Approach (EAPC)			.064	.077
Emotional Avoidance (EAVC)			-.117	-.128
A woman who has been severely beaten				
Coping Dimension Endorsement	.003	.166		
PFC			.012	.009
EAPC			.015	.019
EAVC			-.049	-.050
A child who has been seriously injured				
Coping Dimension Endorsement	.009	.503		
PFC			.044	.038
EAPC			.027	.032
EAVC			-.078	-.079
A couple grieving in front of a gravestone				
Coping Dimension Endorsement	.054*	3.30*		
PFC			-.030	-.044
EAPC			.189**	.201**
EAVC			-.111	-.131
A serious motor vehicle accident				
Coping Dimension Endorsement	.031	1.83		
PFC			-.098	-.107
EAPC			.007	.023
EAVC			-.138*	-.146

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

Note. Standardized regression coefficients were obtained from the step at which all main effects were included.

Moderating Effects of Personality Traits upon Coping Endorsement: Relation to Depressive Symptomatology.

While coping with stressful encounters has frequently been related to symptoms of depression, certain personality traits (defined by the five-factor model) may act to strengthen, weaken or even change the direction of this relationship (Bolger & Zuckerman, 1995). Accordingly, the moderating influence of personality characteristics upon coping dimension endorsement was assessed in relation to depressive symptoms. In line with Baron and Kenny's (1986) procedures for the analysis of moderator effects, hierarchical regression analyses were conducted in which depressive symptomatology was regressed onto coping dimension endorsement in the first step, and personality trait scores were entered in the second step of the analysis. Finally, to assess the possibility that personality traits may be more important in buffering against depression among participants endorsing particular coping dimensions, while others may be more important in augmenting this relationship, the interactions between the standardized coping dimension scores and personality traits were entered on the third step. This analysis was conducted separately for each of the five personality traits of interest.

Coping endorsements were found to be a significant predictor of depressive symptomatology, $F = (3, 196) = 21.60$, $p < .001$, as shown in Tables 4-8 inclusively. As noted earlier, all three coping dimensions were significantly correlated with depression scores. Specifically, increased endorsement of both emotional approach and emotional avoidance coping dimensions, and decreased endorsement of problem-focused coping dimensions were associated with greater depressive symptomatology. Furthermore, certain personality traits including lower levels of agreeableness (F_{change} (1, 195) = 8.44,

$p < .01$), conscientiousness (F_{change} (1, 195) = 5.52, $p < .05$), and extraversion (F_{change} (1, 195) = 9.42, $p <. 01$) and higher levels of neuroticism (F_{change} (1, 195) = 28.87, p < .01), were identified as significant predictors of depressive symptomatology, over and above what could be attributed to coping dimension endorsement, whereas openness to experience was not (F = 1.66, *ns*).

Table 4.

Regression Analyses Assessing Moderating Effects of Agreeableness upon Coping Endorsement: Relation to Depressive Symptomatology.

	Depressive symptoms		
	r	β	R^2*change*
Coping Dimension			.248***
PFC	-.143*	-.143*	
EAPC	.457***	.399***	
EAVC	.162*	.098	
Personality Traits			
Agreeableness (A)	-.348***	-.175*	.031**
Interactions Between Agreeableness and			.017
PFC	-.040	-.016	
EAPC	-.150*	-.110	
EAVC	.018	-.057	

* *p*<.05; ** *p* <.01; *** *p* <.001

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Table 5.

Regression Analyses Assessing Moderating Effects of Conscientiousness upon Coping Endorsement: Relation to Depressive Symptomatology.

	Depressive symptoms			
	r	β	R^2*change*	simple slope β
Coping Dimension			.248***	
PFC	-.143*	-.164**		
EAPC	.457***		.412***	
EAVC	.162*	.075		
Personality Traits				
Conscientiousness (C)	-.269***	-.153*	.021*	
Interactions Between Conscientiousness and			.025	
PFC	-.077	-.006		
EAPC	-.180**	-.145*		
EAVC	.038	-.046		

* p<.05; ** p <.01; *** p <.001

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Table 6.

Regression Analyses Assessing Moderating Effects of Extraversion upon Coping Endorsement: Relation to Depressive Symptomatology.

	Depressive symptoms			
	r	β	R^2*change*	simple slope β
Coping dimension			.248***	
PFC	-.143*	-.143*		
EAPC	.457***		.436***	
EAVC	.162*	.047		
Personality Traits				
Extraversion (E)	-.270***	-.184***	.035**	
Interactions Between Extraversion and			.020	
PFC	-.067	.072		
EAPC	-.183**	-.121*		
EAVC	.043	.027		

* p<.05; ** p <.01; *** p <.001

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Table 7.

Regression Analyses Assessing Moderating Effects of Openness upon Coping Endorsement: Relation to Depressive Symptomatology.

	Depressive symptoms			
	r	β	R^2*change*	simple slope β
Coping Dimension			.248***	
PFC	-.143*	-.176**		
EAPC	.457***	.450***		
EAVC	.162*	.123*		
Personality Traits				
Openness to Experience (O)	-.173**	-.052	.006	
Interactions Between Openness to Experience and			.060***	
PFC	-.039	.006		
EAPC	-.228	-.235***		
Interactions Follow Up Analysis				
1 standard deviation below the openness mean x EAPC				.253**
1 standard deviation above the openness mean x EAPC				.627***
EAVC	-.005	-.095		

* p<.05; ** p <.01; *** p <.001

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Table 8.

Regression Analyses Assessing Moderating Effects of Neuroticism upon Coping Endorsement: Relation to Depressive Symptomatology.

	Depressive symptoms			
	r	β	R^2*change*	simple slope β
Coping Dimension			.248***	
PFC	-.143*	-.087		
EAPC	.457***		.250***	
EAVC	.162*	.142*		
Personality Traits				
Neuroticism (N)	.512***		.400***	.097***
Interactions Between Neuroticism and			.030*	
PFC	-.052	-.004		
EAPC	.105	.158**		
Interactions Follow Up Analysis				
1 standard deviation below the neuroticism mean x EAPC				.419***
1 standard deviation above the neuroticism mean x EAPC				.092
EAVC	.064	.061		

* *p*<.05; ** *p* <.01; *** *p* <.001

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Only the personality dimensions of openness to experience (R^2 = .060) and neuroticism (R^2 = .030) appeared to be significant moderators of the relations between coping and depressive symptoms. In these instances, the moderating effect was only evident with respect to the relations between emotional approach coping and depressive symptomatology (see Tables 7 and 8 respectively).

Follow Up Analyses: Moderating Effects of Personality Traits upon Emotional Approach Coping Endorsement in Relation to Depressive Symptomatology.

Simple slope analyses were conducted to follow up any significant moderator effects in order to determine the nature of such interactions. Simple slope analyses examining the relations between emotional approach coping and depressive symptoms were conducted at one standard deviation below and above the mean of each of the personality dimensions that appeared to moderate this relation. Adding or subtracting one standard deviation to/from the standardized personality means creates variables representing lower vs. higher scores respectively on those particular personality traits. As seen in Tables 7 and 8, respectively, the relation between depressive symptoms and emotional approach coping were strongest when lower scores on the openness to experience, and higher scores of neuroticism were entered in the analysis.

Moderating Effects of Personality Traits upon Coping Endorsement: Relation to Post-Stressor Cortisol Reactivity.

Given the considerable variability regarding individual neuroendocrine responses to stressors, it was of interest to determine whether personality traits moderated the effects of coping endorsement on post-stressor cortisol reactivity. Prior to examining the possible moderating effects of personality traits upon coping endorsement, a repeated measures analysis was conducted as an initial step to confirm that cortisol reactivity scores varied over time in relation to depression category. To examine this, cortisol reactivity at the five different time points were entered as the within subjects variable while depression category (i.e., non-depressed, mildly depressed and moderately depressed) was entered as the between groups factor. Results demonstrate that while the main effect of cortisol reactivity were significant, $F(4, 692) = 56.25$ $p<.001$, $\eta^2 = .24$, contrary to expectations, the effect was not moderated by depression scores $F(4, 692) =$ *ns*.

As outcome variables, cortisol reactivity was operationalized as ratio-to-baseline reactivity scores. Baseline cortisol levels were determined from the second saliva sample provided, as this time would have corresponded with one that permitted habituation to the experimental environment (i.e., experiment room) and to the experimental procedures (i.e., study questionnaires). As the second cortisol reactivity score reflected baseline levels and given that the neurophysiological cascade of events culminating in the secretion of cortisol into circulation by the adrenal cortex requires time, the following two ratio-to-baseline cortisol reactivity scores were computed: (a) cortisol levels 15 minutes following presentation of the final photograph relative to baseline and (b)

cortisol levels at 30 minutes following presentation of the final photograph relative to baseline.

Once again, in line with Baron and Kenny's (1986) procedures for the analysis of moderator effects, hierarchical regression analyses were conducted in which post-stressor cortisol reactivity was regressed onto coping dimension endorsement in the first step, while personality trait scores were entered in the second step of the analysis. Finally, to assess the possibility that particular personality traits maybe more important in buffering against neuroendocrine reactivity to a laboratory stressor among participants endorsing certain coping dimensions, the interactions between the standardized coping dimension scores and personality traits were entered on the third step

Post-Stressor Cortisol Reactivity: Moderating Effects of Personality Traits over Emotional Approach Coping Endorsement.

While general coping endorsement was not a significant predictor of 15-minute (F_{change} = (3, 176) = 1.23, *ns*), or 30-minute post-stressor cortisol reactivity (F = (3, 174) = 2.35, *ns*), endorsement of emotional approach coping was uniquely associated with lower 15 and 30-minute post stressor cortisol reactivity, shown in Tables 9 and 10, respectively. Additionally, while personality trait scores were not found to account for a significant proportion of variance with respect to the 15-minute (F = (1, 175) = 2.15, *ns*) or among 30-minute post-stressor cortisol reactivity scores ($F_{change} < 1$), openness to experience was found to uniquely predict lower 30-minute post-stressor cortisol levels (see Table 10). Finally, only one of the five personality traits, namely, openness to experience, moderated the effects of coping on 15-minute post-stressor cortisol reactivity

(see Table 9). However, openness to experience was not found to significantly moderate the effects of coping on 30-minute post stressor cortisol reactivity (R^2 = .080, $F(7, 170)$ = 2.10, *ns*). Furthermore, with respect to 30-minute post-stressor cortisol reactivity, only one of the personality traits served a significant moderating effect, but in this instance, conscientiousness was the critical characteristic (see Table 10). Additionally, it is of interest to note that although conscientiousness was not identified as a significant moderator of coping on 15-minute post-stressor cortisol reactivity, a similar pattern of interaction effects of conscientiousness on coping (albeit, non-significant) was observed as in the condition where 30-minute cortisol levels were the outcome variable (R^2 = .043, $F(7, 179) = 1.10$, p = .093).

Table 9.

Regression Analyses Assessing the Moderating Effects of Openness to Experience upon Coping Endorsement: Relation to 15-minute Post-Stressor Cortisol Reactivity.

	Cortisol Reactivity Score			
	r	β	R^2*change*	simple slope β
Coping Dimension			.021	
PFC	.060	.109		
EAPC	-.117	-.147*		
EAVC	-.066	-.053		
Personality Traits			.012	
Openness to Experience (O)	-.070	-.112		
Conscientiousness (C)	-.022	-.075		
Extraversion (E)	-.026	-.075		
Agreeableness (A)	-.052	-.120		
Neuroticism (N)	-.033	.040		
Interactions Between Openness to Experience and			.034	
PFC	-.062	-.123		
EAPC	-.157*	-.153*		
Interactions Follow Up Analysis				
1 standard deviation below the openness mean x EAPC				-.287**
1 standard deviation above the openness mean x EAPC				.015
EAVC	-.011	-.025		

* p<.05; ** p <.01; *** p <.001

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Table 10.

Regression Analyses Assessing the Moderating Effects of Conscientiousness upon Coping Endorsement: Relation to 30-minute Post-Stressor Cortisol Reactivity.

	Cortisol Reactivity Score			
	r	β	R^2*change*	simple slope β
Coping Dimension			.039	
PFC	.032	.028		
EAPC	-.141*	-.152*		
EAVC	-.146*	-.135		
Personality Traits			.001	
Openness to Experience (O)	-.113	-.184*		
Conscientiousness (C)	.046	-.027		
Extraversion (E)	-.017	-.083		
Agreeableness (A)	-.001	-.078		
Neuroticism (N)	-.042	.029		
Interactions Between Conscientiousness and			.023	
PFC	.003	-.012		
EAPC	-.144*	-.149*		
Interactions Follow Up Analyses				
1 standard deviation below the conscientiousness mean x EAPC				-.310**
1 standard deviation above the conscientiousness mean x EAPC				.004
EAVC	.019	-.005		

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

Note. Standardized regression coefficients obtained from the step at which all main effects were included. PFC = problem-focused coping dimension, EAPC = emotional approach coping dimension, EAVC = emotional avoidance coping dimension.

Follow up Analyses: Moderating Effects of Openness to Experience upon Emotional Approach Coping Endorsement in Relation to Cortisol Reactivity

Simple slope analyses (as described earlier) examining the relations between emotional approach coping and post-stressor cortisol reactivity were conducted at one standard deviation below and above the mean of the personality domains which appeared to moderate this relation. As seen in Table 9, the relation between the 15-minute post-stressor cortisol reactivity ratio and the emotional approach coping dimension were strongest when higher scores on the openness to experience domain were reported. Furthermore, as seen in Table 10, the relation between the 30-minute post-stressor cortisol reactivity ratio and the emotional approach coping dimension were strongest when higher scores on the conscientiousness domain were reported.

Discussion

The present investigation was conducted primarily to examine the relationship between coping endorsement and depressive symptomatology among undergraduate students. Earlier research examining the influence of coping processes upon depressive symptomatology prompted the suggestion that dispositional characteristics (personality traits in particular) might serve to moderate coping endorsement, thereby influencing depression by either augmenting or protecting against individual vulnerability (e.g., Bolger & Zuckerman, 1995; Priel & Shahar, 2000). As such, the present investigation examined moderating effects of personality traits (defined by the five-factor model) upon coping endorsement with respect to depressive symptomatology.

Coping Endorsement and Depression:

Previous research had demonstrated that depressed individuals have a propensity towards greater endorsement of emotion-focused coping strategies (Penley et al., 2002) coupled with decreased endorsement of problem-focused coping efforts (Matheson & Anisman, 2003; McCabe et al., 2004; Ravindran et al., 1999). In support of such findings it was observed that non-depressed participants exhibited greater endorsement of active distraction (i.e., a problem-focused coping strategy) relative to rumination, self blame and other blame (i.e., emotion-focused coping strategies). In contrast, the endorsement of the emotionally focused coping strategies, often considered to be maladaptive (i.e., rumination and emotional expression), was greater among moderately depressed participants relative to those with low levels of symptoms. In contrast, there were no significant differences between the mildly depressed and the moderately depressed

groups of participants regarding the endorsement of any of the 12 coping strategies comprising the SCOPE. It is significant that the endorsement of the emotionally focused strategies among subsyndromal depressive individuals (i.e., the moderately depressed condition) was as pronounced as that previously reported among major depressive and dysthymic patients (cf. Ravindran et al., 1999, 2002). Although speculative, it may be that the excessive or preferential use of such coping strategies among subsyndromal individuals may be a harbinger of more profound depression provided that the individuals encounter severe or unpredictable stressors.

It is unclear whether emotion-focused coping serves as a precipitating factor for depression, or whether depressive mood provoked the use of such ineffective strategies. Indeed, given the negative cognitive bias associated with depression (Chamberlain & Sahakian, 2004; Leucht, Wada & Kurz, 1997), emotion focused coping may simply reflect part of the depressive symptom profile. Alternatively, the adoption of this coping strategy may be a learned response. That is, depressed individuals may gain attention and sympathy, at least early on, by using emotional expression coupled with social support seeking. Likewise, it has been suggested that there may be little or no immediate reinforcement in using problem-focused coping strategies, whereas emotion-focused strategies decrease distress associated with the stressful encounter, thereby providing immediate reinforcement (Bouchard, 2003). Of course, the seemingly beneficial short-term effects of emotion-focused coping may be detrimental in the long run. For instance, the tendency to blame others or to express one's emotions may diminish feelings of responsibility and distress, while interfering with more long-term adaptive strategies including social support seeking and active problem solving (Tennen & Afleck, 2000).

Given the mood reactivity of depressed individuals, it may be that for them emotion-focused strategies are more rewarding, and hence more likely to be adopted.

Moderating Effects of Personality Traits upon Coping Endorsement: Relevance to Depressive Symptomatology

While considerable variability exists regarding the development or exacerbation of depressive illness following stressful encounters, coping endorsement and personality traits have been shown to uniquely account for much of this variability. As mentioned earlier, as a group, problem focused coping strategies were negatively related to depression scores, while emotion-focused coping strategies were associated with increased depressive symptoms. Additionally, as reported elsewhere (Hayes & Joseph, 2002; Harkness et al., 2002; Lawrence and Fauerbach, 2003; McWilliams, Cox & Enns, 2003), low levels of depressive symptoms were predicted from higher scores on the conscientiousness, openness to experience, extraversion, and agreeableness domain. In line with expectations and the results of Bolger and Zuckerman (1995), the present study indicated that certain personality traits moderated the influence of coping factors on depressive illness.

As suggested by Costa and McCrae (1985) and as demonstrated by others (e.g., Farmer et al. 2002; Lawrence & Fauerbach, 2003), among highly neurotic participants the endorsement of emotion-focused coping strategies during stressful events partly accounted for the subjective psychological distress frequently reported by them. Consistent with such findings, neuroticism and emotion focused coping endorsement scores interacted to predict depression. Furthermore, higher neuroticism scores were

associated with augmentation of the association between emotional approach coping dimension endorsement and depressive symptoms, whereas lower scores on the neuroticism domain were associated with this coping-depression relationship being non-significant. As highly neurotic individuals are characterized by heightened negative self-evaluative biases and blame (i.e., both self and other-blame) (Costa and McCrae, 1985), the endorsement of a coping profile comprising increased rumination, emotional expression, self blame and other blame may exaggerate these negative attributes, thus accounting for the increased vulnerability to depressive illness.

In assessing the contribution of coping to depression, it is essential to consider how appraisal and coping strategies may interact to affect outcomes. Lazarus et al (e.g., Lazarus & Alfert 1964; Lazarus, Opton, Nomikos, & Rankin, 1965) provided evidence towards a cognitive appraisal theory of emotion and stress, which essentially argues that cognitive evaluations of noxious stimuli (e.g., electric shock or films of traumatic events) determine the nature of one's emotional and physiological responses. Advocates of this view asserted that emotions are undifferentiated physiological states, which require some level of cognitive processing to provide an interpretation and subsequent conscious experience of that particular emotion (Ortony, Clore & Collins, 1988). These theorists described two basic types of emotions: low-cognitive emotions (e.g., fear, surprise and anger) and high-cognitive emotions (e.g., shame, guilt and embarrassment), with the latter being most greatly affected through cognitive appraisal (Ortony et al., 1988).

In accordance with this latter perspective, highly neurotic individuals frequently experience emotions affected by cognitive appraisals such as shame, guilt and embarrassment (Costa & McCrae, 1985; Ortony et al., 1998), and are also characterized

by dysfunctional cognitive processes including irrational thoughts and intrusive cognitions (Costa & McCrae, 1985). As such, research might benefit from examining the interactive effects of cognitive appraisals and coping endorsement among neurotic participants, which might possibly account for a proportion of the inter-individual variability noted in the relationship between coping and depression. Indeed, the effectiveness of cognitive behaviour therapy might stem, in part, by having the individual appraise situations appropriately and then to endorse coping strategies that are effective in both the short- and long-term (Segal, Whitney & Lam, 2001).

While it was hypothesized that extraversion, openness to experience and conscientiousness would interact with problem-focused coping to strengthen the negative association with depression, this outcome was not observed. Rather, these personality traits significantly interacted with emotional approach coping endorsement, buffering against the depressive vulnerability associated with this coping dimension. Conversely, lower scores on any of these three personality traits demonstrated increased vulnerability towards depressive illness ordinarily associated with the endorsement of the emotional approach coping dimension.

Although previous research demonstrated that extraverted individuals endorse problem-focused coping strategies, partly accounting for their subjective well-being following stressful encounters (David & Suls, 1999), there were no interaction effects between extraversion scores and problem focused coping endorsement with respect to depression scores within this study. Rather, as mentioned earlier, extraversion scores interacted with the endorsement of a group of emotion focused coping strategies protecting against depressive symptomatology. Once again, drawing upon the cognitive

appraisal theory of emotions and stress, and in accordance with previous research examining personality, cognitions and depression (Geerts & Bouhuys, 1998), the possibility exists that the defining characteristics of highly extraverted individuals, including optimistic cognitions about health behaviour outcome expectancies (Diener, Oishi & Lucas, 2003; Williams, Obrien & Colder, 2004), sociability and energy (Lawrence & Fauerbach, 2003), may help explain the present findings. For instance, optimistic health expectancies may act to buffer against the negative influence of a seemingly maladaptive group of emotion-focused coping strategies. Again, although speculative, highly extraverted individuals (who are characterized by increased sociability (Costa & McCrae, 1985; Lawrence & Fauerbach, 2003)) may use increased emotional expression as a means of obtaining adaptive resources, such as social support. Again, a more comprehensive examination of stressor related appraisals coupled with more detailed analysis of personality factors, particularly when conducted in a prospective type of study, would be beneficial in outlining the stressor-coping-depression topography among highly extraverted individuals.

Individuals assessed as highly open to experiences commonly take into consideration multiple perspectives when appraising stressful encounters, and are more willing to adopt new, more adaptive coping styles to diminish subsequent adverse effects (Carver & Scheier, 1994; Lawrence & Fauerbach, 2003). In the present investigation, an interaction between scores on this personality domain and the endorsement of seemingly adaptive coping strategies was not observed. Rather, scores on this domain significantly interacted with the endorsement of a group of emotion focused coping strategies to predict depression scores. Once again, the cognitive appraisal theory of emotion and

stress may help explain how the relationship between emotion focused coping endorsement and depression, was influenced by varying levels of openness to experience. The possibility exists that individual characteristics, including intellectual curiosity and cognitive flexibility, common among highly open individuals (Lawrence & Fauerbach, 2003) may act to buffer against the negative influence of a seemingly maladaptive group of emotion-focused coping strategies. For instance, highly open individuals may ruminate, blame, or express their emotions as a means of obtaining more adaptive resources including active problem solving or cognitive restructuring.

Conscientiousness, like several of the other personality factors, influenced the relationship between coping and depression. Specifically, this characteristic interacted with emotion-focused coping to protect against the intensity of depression. Lower scores on the conscientiousness domain coupled with the endorsement of emotional approach coping strategies during stressful events predicted increased depressive symptoms. There exists a possibility that a propensity towards order, competence and a desire to achieve goals, dispositional qualities common among highly conscientious individuals (Lawrence & Fauerbach, 2003), might interact with the way in which individuals use maladaptive coping strategies such as rumination, blame and emotional expression. It would be beneficial to understanding the complex nature concerning individual coping endorsement and psychological well being, to examine how different people use the coping strategies they endorse during stressful encounters. Although speculative, within this study, the possibility exists that highly conscientious individuals may ruminate differently or express their emotions for different reasons, relative to individuals who scored low on this particular disposition. Again, further analyses examining the

moderating effects of dispositional characteristics upon coping endorsement, with a particular emphasis on individual cognitive appraisals of stressful events, are required to elucidate the complex interactions underlying inter-individual variability in stress-coping related mood disorders.

Coping Endorsement and Post-Stressor Cortisol Reactivity.

As mentioned earlier, dysfunctional HPA axis activation, including cortisol hyper-secretion, are associated with immunosuppression and psychiatric disorders (Jessop, 1999). While HPA activation is a typical response to stressors, there appears to be considerable inter-individual variability in this respect. Such variability, it will be recalled, may stem from the influence of a wide range of experiential (early life events, previous stressor experiences), organismic (e.g., age, genetics) and individual difference characteristics (Anisman & Matheson, 2004). As such, this study set out to examine the interactive effects of individual differences and coping endorsement upon cortisol reactivity to stressful events.

Results of this study partly support previous findings with respect to stressor effects on neuroendocrine reactivity. For instance, as reported by Schommer, Kudielka, Hellhammer and Kirschbaum (1999), cortisol responses to an acute psychosocial stressor (e.g., presentation of traumatic photographs) did not vary between the various personality types measured. Although many investigators have examined the associations between certain dispositional traits (e.g., Type A and B personalities) and stressor related cortisol reactivity (e.g., Grossi, Ahs & Lundberg, 1998; Walsh, Wilding, Eysenck & Valentine, 1997), few studies have examined the associations between cortisol reactivity and

personality characteristics defined by the five factor model. A notable exception (Vickers, Hervig, Poth & Hackney, 1995) not only demonstrated increased cortisol levels in soldiers undergoing military basic training, but also that cortisol reactivity was dependant upon personality traits defined by the five factor model of personality. For instance, agreeableness scores were associated with higher circulating cortisol levels in the middle of training, while conscientiousness scores were associated with lower circulating cortisol at the end of the training session.

In accordance with results of Spangler, Pekrun, Kramer and Hoffman (2002), among participants in the present study, the endorsement of a group of emotion focused coping strategies predicted neuroendocrine responses following the presentation of the laboratory stressor. Furthermore, Spangler et al. (2002) demonstrated that emotion focused coping strategies were related to low cortisol responses following an exam among a sample of university students. Spangler et al. (2002) suggested that post-stressor neuroendocrine responses are not only dependent upon situational factors, but may also be co-regulated by stable psychological, dispositional as well as coping abilities. The results of the present investigation were consistent with this formulation in that the endorsement of the emotional approach coping dimension uniquely predicted a decrease in both the 15 and 30-minute post-cortisol reactivity scores.

Moderating Effects of Personality Traits upon Coping Endorsement: Relevance to Post-Stressor Cortisol Reactivity.

As expected, the relationship between the endorsement of a group of emotion focused coping strategies (including rumination, emotional expression, self and other blame) and post-stressor cortisol reactivity varied with conscientiousness and openness to experience. Specifically, both higher conscientiousness and higher openness to experience scores interacted with the endorsement of the emotional approach coping dimension augmenting the magnitude of the relationship between emotion focused coping and post-stressor cortisol reactivity. Contrary to expectations, however, agreeableness, extraversion and neuroticism did not significantly interact with coping strategies to influence cortisol reactivity scores.

Interestingly, it was demonstrated that the magnitude of the negative relationship between emotional approach coping endorsement and 15-minute post-stressor cortisol reactivity was strengthened when higher scores on the openness to experience domain were entered in the analysis. Furthermore, when lower scores for the openness to experience domain were entered in the analysis, the magnitude of the relationship between this coping dimension and 15-minute post-stressor cortisol reactivity was weakened so that it did not reach statistical significance. As discussed earlier, the possibility exists that the defining characteristics of highly open individuals, namely heightened intellectual curiosity, a preference for variety, and a high level of cognitive flexibility in stressful situations (Lawrence & Fauerbach, 2003), not only protects against depressive symptomatology, but may also protect against prolonged neuroendocrine reactivity to stressors. Although speculative, the possibility exists that the heightened

self-assertiveness, intellectual curiosity and high level of cognitive flexibility noted in highly open individuals may influence the efficacy of a seemingly maladaptive group of coping strategies endorsed during stressful situations.

It is of interest that while higher scores on the conscientiousness domain moderated the endorsement of a group of emotion focused coping strategies so as to weaken the subsequent association with depression, these same conscientiousness scores predicted lower salivary cortisol levels measured 30 minutes post-stressor. Additionally, lower scores on the conscientiousness domain were associated with the post stressor cortisol reactivity and coping relationship, in that the magnitude of this relationship declined to a non-significant level. It is interesting to note, as discussed earlier, that it is conceivable that the individual qualities which define highly conscientious individuals, including a propensity towards order, competence and a desire to achieve goals (Lawrence & Fauerbach, 2003), may protect against prolonged neuroendocrine reactivity to stressful encounters. Although conscientiousness scores did not correlate with post-stressor cortisol reactivity within this study, others (e.g., Vickers et al, 1995) have demonstrated that higher conscientiousness scores were related to lower circulating cortisol levels measured at the end of a stressful period. It is tempting to suggest that highly conscientious individuals efficiently employ a group of seemingly maladaptive coping strategies thereby reducing physiological alterations and ensuing emotional distress. For instance, a highly conscientious individual who strives for order, competence and who is highly goal oriented may use rumination as a means to increase focus, and concentrate on the problem at hand, to come up with accurate appraisals of, and an adaptive behavioural response to the stressor. By doing so, distress stemming

from exaggerated appraisals, ambiguity of the situation, or by the endorsement of an otherwise maladaptive group of coping strategies may be diminished relative to those who are less organized, competent or goal oriented. In order to draw such conclusions, however, further analyses are needed incorporating measures of cognitive appraisals of various stressors among different types of individuals. As well, a more precise measure of rumination (i.e., to differentiate between intellectual self-assertiveness versus neurotically motivated self-focus for instance) may be beneficial to understand the complex nature of the stress-coping-pathology relationship.

Summary

The results of the present investigation are consistent with the view that depression is associated with the endorsement of a group of coping strategies geared towards regulating one's emotions as opposed to dealing with the problem at hand. Furthermore, this study demonstrated that certain personality traits account for some of the unexplained variability in depression levels often noted between different individuals endorsing identical coping strategies during stressful encounters. Specifically, higher scores on the conscientiousness, extraversion, or openness to experience domain were shown to interact with the endorsement of an emotional approach coping style, such that the magnitude of the coping-depression relationship diminished with endorsement of these emotion focused strategies. Yet, higher scores on the neuroticism domain interacted with the same emotional approach coping style, such that the magnitude of the coping-depression relationship increased with endorsement of this group of coping strategies. Although speculative, clinical implications of this study may exist. For instance, cognitive behavioural therapy may be helpful for highly neurotic individuals as their distorted cognitions may affect coping effectiveness. However, further research into the specific qualities defining individual personalities (e.g., cognitive processes, appraisals and attitudes) is required to clarify why certain coping strategies buffer against depressive vulnerability in some, while augmenting the risk in other personalities.

Consistent with previous findings, this study not only demonstrated that the endorsement of a group of emotion focused coping strategies predict low cortisol reactivity following stressful encounters, but that such post-stressor neuroendocrine responses are co-regulated by dispositional factors (i.e., personality traits) and coping

endorsement. It was demonstrated that higher scores on either the conscientiousness or openness to experience domain interacted with the endorsement of the emotion focused coping strategies augmenting the magnitude of the relationship between an emotional approach coping style and post-stressor cortisol reactivity. Again, as HPA axis dysfunction is associated with a wide range of pathologies including depression, possible clinical implications exist. Although it is uncertain whether post-stressor cortisol levels demonstrated in this study represent clinical significant variations (i.e., hypo or hypercortisolemia), measures of personality traits might be beneficial when establishing individual treatment programs for depression.

Appendix A

BECK DEPRESSION INVENTORY (21-item version; Beck & Beck, 1972)

On this questionnaire are groups of statements. Please read the entire group of statements of each category. Then pick out ONE statement in that group which best describes the way you feel. Check off the number beside the statement you have chosen.

---

1. ___ 0 = I do not feel sad
   ___ 1 = I feel sad or blue
   ___ 2a = I am blue or sad all of the time and I can't snap out of it
   ___ 2b = I am so sad or unhappy that it is very painful
   ___ 3 = I am so sad or unhappy that I can't stand it

2. ___ 0 = I am not particularly pessimistic or discouraged about the future
   ___ 1 = I feel discouraged about the future
   ___ 2a = I feel I have nothing to look forward to
   ___ 2b = I feel I won't every get over my troubles
   ___ 3 = I feel that the future is hopeless and things cannot improve

3. ___ 0 = I do not feel like a failure
   ___ 1 = I feel I have failed more than the average person
   ___ 2a = I feel I have accomplished very little that is worthwhile or that means anything
   ___ 2b = As I look back on my life, all I can see is a lot of failures
   ___ 3 = I feel I am a complete failure as a person

4. ___ 0 = I am not particularly dissatisfied
   ___ 1a = I feel bored most of the time
   ___ 1b = I don't enjoy things the way I used to
   ___ 2 = I don't get satisfaction out of anything anymore
   ___ 3 = I am dissatisfied with everything

5. ___ 0 = I don't feel particularly guilty
   ___ 1 = I feel bad or unworthy a good part of the time
   ___ 2a = I feel quite guilty
   ___ 2b = I feel bad or unworthy practically of the time now
   ___ 3 = I feel as though I am very bad or worthless

6. ___ 0 = I don't feel I am being punished
   ___ 1 = I have a feeling that something bad may happen to me
   ___ 2 = I feel I am being punished or will be punished
   ___ 3a = I feel I deserve to be punished
   ___ 3b = I want to be punished

7. ___ 0 = I don't feel disappointed in myself
___ 1a = I am disappointed in myself
___ 1b = I don't like myself
___ 2 = I am disgusted with myself
___ 3 = I hate myself

8. ___ 0 = I do not feel I am any worse than anybody else
___ 1 = I am very critical of myself for my weaknesses or mistakes
___ 2a = I blame myself for everything that goes wrong
___ 2b = I feel I have many bad faults

9. ___ 0 = I don't have thoughts of harming myself
___ 1 = I have thoughts of harming myself but I would not carry them out
___ 2a = I feel I would be better off dead
___ 2b = I have definite plans about committing suicide
___ 2c = I feel my family would be better off if I were dead
___ 3 = I would kill myself if I could

10. ___ 0 = I don't cry anymore than usual
___ 1 = I cry more now than I used to
___ 2 = I cry all the time now. I can't stop it
___ 3 = I used to be able to cry but now I can't cry at all even though I want to

11. ___ 0 = I am no more irritated now than I ever am
___ 1 = I get annoyed or irritated more easily than I used to
___ 2 = I get irritated all the time
___ 3 = I don't get irritated at all the things that used to irritate me.

12. ___ 0 = I have not lost interest in other people
___ 1 = I am less interested in other people than I used to be
___ 2 = I have lost most of my interest in other people and I have little feeling for them
___ 3 = I have lost all my interest in other people and don't care about them at all

13. ___ 0 = I make decisions about as well as ever
___ 1 = I am less sure of myself now and try to put off making decisions
___ 2 = I can't make decisions anymore without help
___ 3 = I can't make decisions at all anymore

14. ___ 0 = I don't feel I look any worse than I used to
___ 1 = I am worried that I am looking old or unattractive
___ 2 = I feel that there permanent changes in my appearance and they make me look unattractive
___ 3 = I feel that I am ugly or repulsive looking

15. ___ 0 = I can work about as well as before
___ 1a = It takes extra effort to get started at doing something
___ 1b = I don't work as well as I used to
___ 2 = I have to push myself very hard to do anything
___ 3 = I can't do any work at all

16. ___ 0 = I can sleep as well as usual
___ 1 = I wake up more tired in the morning than I used to
___ 2 = I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
___ 3 = I wake up early every day and can't get more than 5 hours sleep

17. ___ 0 = I don't get anymore tired than usual

___ 1 = I get tired more easily than I used to

___ 2 = I get tired from doing anything
___ 3 = I get too tired to do anything

18. ___ 0 = My appetite is no worse than usual
___ 1 = My appetite is not as good as it used to be
___ 2 = My appetite is much worse now
___ 3 = I have no appetite at all any more

19. ___ 0 = I haven't lost much weight, if any, lately
___ 1 = I have lost more than 5 pounds
___ 2 = I have lost more than 10 pounds
___ 3 = I have lost more than 15 pounds

20. ___ 0 = I am no more concerned about my health than usual
___ 1 = I am concerned about aches and pains or upset stomach or constipation or other unpleasant feelings in my body
___ 2 = I am so concerned with how I feel or what I feel that it's hard to think of much else
___ 3 = I am completely absorbed in what I feel

21. ___ 0 = I have not noticed any recent change in my interest in sex
___ 1 = I am less interested in sex than I used to be
___ 2 = I am much less interested in sex now
___ 3 = I have lost interest in sex completely

Appendix B

DISTRESS APPRAISAL SCALE (extracted from the SCOPE; Matheson & Anisman, 2003).

Presentation of the following 5 photographs in viewing order:

a) an elderly male whose spouse appears to be terminally ill (#2205 from the International Affective Picture System);
b) a woman who has been severely beaten (#3181 from the International Affective Picture System);
c) a child who has been seriously injured (#3301 from the International Affective Picture System);
d) a couple grieving in front of a gravestone (#9220 from the International Affective Picture System);
e) a serious motor vehicle accident (#9910 from the International Affective Picture System).

1. How does this picture make you feel?

Distressed or Sad				Happy			
Not at all	A little	A fair bit	Very Much	Not at all	A little	A fair bit	Very Much
0	**1**	**2**	**3**	**0**	**1**	**2**	**3**

Appendix C

FIVE FACTOR INVENTORY (John, Donahue, & Kental, 1991).

I see myself as someone who . . .

Instructions: For each of the 44 characteristics listed below, rate how descriptive each characteristic is of you using the scale from 1 to 5 as shown below:

1	2	3	4	5
Disagree strongly	**Disagree a little**	**Neither Agree or disagree**	**Agree a little**	Agree strongly

---

I see myself as someone who . . .

1. Is talkative

   _____

2. Tends to find fault with others

   _____

3. Does a thorough job

   _____

4. Is depressed, blue

   _____

5. Is original, comes up with new ideas

   _____

6. Is reserved

   _____

7. Is helpful and unselfish with others

   _____

8. Can be somewhat careless

   _____

9. Is relaxed, handles stress well

   _____

10. Is curious about many different things

    _____

11. Is full of energy

    _____

12. Starts quarrels with others

    _____

13. Is a reliable worker

    _____

14. Can be tense

    _____

15. Is ingenious, a deep thinker

    _____

16. Generates a lot of enthusiasm

    _____

17. Has a forgiving nature

    _____

18. Tends to be disorganized

    _____

19. Worries a lot

    _____

20. Has an active imagination

    _____

21. Tends to be quiet

_____

22. Is generally trusting

_____

23. Tends to be lazy

_____

24. Is emotionally stable, not easily upset

_____

25. Is inventive

_____

26. Has an assertive personality

_____

27. Can be cold and aloof

_____

28. Perseveres until the task is finished

_____

29. Can be moody

_____

30. Values artistic, aesthetic experiences

_____

31. Is sometimes shy, inhibited

_____

32. Is considerate and kind to almost everyone _____

33. Does things efficiently

_____

34. Remains calm in tense situations

_____

35. Prefers work that is routine

_____

36. Is outgoing, sociable

_____

37. Is sometimes rude to others

_____

38. Makes plans and follows through with them _____

39. Gets nervous easily

_____

40. Likes to reflect, play with ideas

_____

41. Has few artistic interests

_____

42. Likes to cooperate with others

_____

43. Is easily distracted

_____

44. Is sophisticated in art, music, or literature

____

Appendix D

SURVEY OF COPING PROFILE ENDORSEMENT (Matheson & Anisman, 2003).

To what extent have you used each of these ways of dealing with problems or stresses in recent months?

	Not at all	A little	Somewhat	A lot
1. accept that there is nothing you can do to change your situation?	0	1	2	3
2. try to just take whatever comes your way?	0	1	2	3
3. talk with friends or relatives about the problem	0	1	2	3
4. try to do things which you typically enjoy?	0	1	2	3
5. seek out information that will help you deal with the problem?	0	1	2	3
6. blame others for creating your stress or making it worse?	0	1	2	3
7. seek the advice of others to resolve your stress?	0	1	2	3
8. blame yourself for your stress?	0	1	2	3
9. exercise?	0	1	2	3
10. try to live a better life according to your religious beliefs?	0	1	2	3
11. say what you feel no matter what others think?	0	1	2	3
12. go over your problems in your mind over and over again?	0	1	2	3
13. ask others for help?	0	1	2	3
14. think about your problems a lot?	0	1	2	3
15. become involved in recreation or pleasure activities?	0	1	2	3
16. worry about the problem a lot?	0	1	2	3
17. try to keep your mind off things that are upsetting you?	0	1	2	3
18. try to distract yourself from thinking about it?	0	1	2	3
19. avoid thinking about the problem?	0	1	2	3
20. make plans to overcome the stress?	0	1	2	3
21. tell jokes about your situation?	0	1	2	3
22. think a lot about who is responsible for your problems (besides yourself)?	0	1	2	3
23. read humorous articles, stories etc. to cheer yourself up?	0	1	2	3
24. tell yourself that other people have dealt with problems such as yours?	0	1	2	3
25. think a lot about how you have brought				

your problems on yourself?	0	1	2	3
26. decide to wait and see how things turn out?	0	1	2	3
27. decide that your current problems are a result of your own past actions?	0	1	2	3
28. go shopping?	0	1	2	3
29. assert yourself and take positive action on problems that are getting you down?	0	1	2	3
30. seek reassurance and moral support from others?	0	1	2	3
31. resign yourself to your problems?	0	1	2	3
32. think about how your problems have been caused by other people?	0	1	2	3
33. be very emotional in how you react, even to little things?	0	1	2	3
34. decide that you can grow and learn through your problems?	0	1	2	3
35. tell yourself that other people have problems like your own?	0	1	2	3
36. look for how you can learn something out of your bad situation?	0	1	2	3
37. ask for God's guidance?	0	1	2	3
38. keep your feelings bottled up inside?	0	1	2	3
39. find yourself crying more than usual?	0	1	2	3
40. try to act as if you were not upset?	0	1	2	3
41. pray for help?	0	1	2	3
42. go out?	0	1	2	3
43. hold in your feelings?	0	1	2	3
44. try to act as if you weren't feeling bad?	0	1	2	3
45. take steps to overcome your problems?	0	1	2	3
46. make humorous comments or wise cracks?	0	1	2	3

References

Amirkhan, J.H. (1990). A factor analytically derived measure of coping: The coping strategy indicator. *Journal of Personality and Social Psychology, 59:* 1066-1074.

Anisman, H., Hayley, S., Kelly, O., Borowski, T., Merali, Z. 2001. Psychogenic, Neurogenic, and Systemic Stressor Effects on Plasma Corticosterone and Behaviour: Mouse Strain-Dependant Outcomes. *Behavioural Neurosciences, 115:* 443-454.

Anisman, H. & Matheson, K. (2004) Anhedonia and Depression: Caveats Concerning Animal Models. *Neurosciences & Biobehavioral Reviews.* (in press).

Baron, R.M., Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research. Conceptual, Strategic and Statistical Considerations. *Journal of Personality and Social Psychology, 51:* 1173-1182.

Beck, A. T., & Beck, R. W. (1972). Screening depressed patients in family practice: A rapid technique. *Postgraduate Medicine, 52,* 81-85.

Benet-Martínez, V. & John, O.P. (1998). 'Los Cinco Grandes' Across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology, 75,* 729-750.

Bishop, G.D., Tong, E.M.W., Diong, S.M., Enkelmann, H.C., Why, Y.P., Khader, M., A., J.C.H. (2001). The relationship between coping and personality among police officers in Singapore. *Journal of Research in Personality, 35:* 353-374.

Bolger, N., & Zuckerman, A. (1995). A Framework for Studying Personality in the Stress Process. *Journal of Personality and Social Psychology, 69:* 890-902.

Bosworth, H.B., Feaganes, J.R., Vitaliano, P.P., Mark, D.B., & Siegler, I.C. (2001). Personality and coping with a common stressor: Cardiac catheterization. *Journal of Behavioural Medicine, 24:* 17-31.

Bouchard, G. (2003). Cognitive Appraisals, Neuroticism, and Openness as Correlates of Coping Strategies: An Integrative Model of Adaptation to Marital Difficulties. *Canadian Journal of Behavioural Science, 35:* 1-12.

Bouchard, G., Guillemette, A., Landry-Léger, N. (2004). Situational and dispositional coping: an examination of their relation to personality, cognitive appraisals, and psychological distress. *European Journal of Personality, 18:* 221-238.

Brebner, J. (2001). Personality and Stress Coping. *Personality and Individual Differences, 31: 317*-327.

Bridge, J.A., Day, N.L., Day, R., Richardson, G.A., Birmaher, B., & Brent, D.A. (2003). Major depressive disorder in adolescents exposed to a friend's suicide. *Journal of the American Academy of Child and Adolescent Psychiatry, 42 :* 1294-1301.

Brissette, I., Scheier, M.F., Carver, C.S. (2002). The role of optimism in social network development, coping, and psychological adjustment during a life transition. *Journal of Personality and Social Psychology, 82:* 102-11.

Carrillo, J.M., Rojo, N., Sanchez-Bernardos, M.L., & Avia, M.D. (2001). *European Journal of Psychological Assessment, 17:* 130-136.

Carver, C.S., & Scheier, M.F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology, 66:* 184-195.

Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56 :* 267-283.

Christensen, A.J., Benotsch, E.G., Wiebe, J.S., & Lawton, W.J. (1995). Coping with Treatment Related Stress: Adherence to Hemodialysis, *Journal of Consulting and Clinical Psychology, 63:* 454-459.

Connor-Smith, J. K., & Compas, B.E. (2002). Vulnerability to Social Stress: Coping as a Mediator or Moderator of Sociotropy and Symptoms of Anxiety and Depression. *Cognitive Therapy and Research, 26:* 39-55.

Costa P.T., Jr., and McCrae R.R. *The NEO Personality Inventory manual.* Odessa, FL: Psychological Assessment Resources, Inc; 1985.

Costa, P.T. Jr., McCrae, R.R., & Zonderman, A.B. (1987). Environmental and dispositional influences on well-being: longitudinal follow-up of an American national sample. *British Journal of Psychology, 78:* 299-306.

Coyne, J.C., & Whiffen, V.E. (1995). Issues in Personality as Diathesis for Depression: The Case of Sociotropy-Dependency and Autonomy-Self-Criticism. *Psychological Bulletin, 118:* 258-378.

Creed, P.A., Patton, W., Bartum, D. (2002). Multidimensional properties of the LOT-R: Effects of optimism and pessimism on career and well-being related variables in adolescents. *Journal of Career Assessment, 10:* 42-61.

Dalgard, O.S., Bjork, S., & Tambs., K. (1995). Social support, negative life events and mental health. *British Journal of Psychiatry, 166:* 29-34.

David, J.P., Suls, J. (1999). Coping efforts in daily life: role of big five traits and problem appraisals. *Journal of Personality, 67:* 265-294.

DeNeve, K.M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124:* 197-229.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being. *Annual Review of Psychology, 54*, 403-425.

Enns, M.W., Larsen, D.K., & Cox, B.J. (2000). Discrepancies between self and observer ratings of depression: the relationship to demographic, clinical and personality variables. *Journal of Affective Disorders, 60:* 33-41.

Farmer, A., Redman, K., Harris, T., Mahmood, A., Sadler, S., Pickering, A., & McGuffin, P. (2002). Neuroticism, extraversion, life events and depression. The Cardiff Depression Study. *British Journal of Psychiatry, 181:*118-122.

Folkman, S., & Lazarus, R.S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21:* 219-239.

Folkman, S., & Lazarus, R.S. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48:* 150-70.

Folkman, S., & Lazarus, R.S. (1988c). Waysof Coping Questionnaire: Research edition. Pala Alto, CA: Consulting Psychological Press.

Folkman, S., Lazarus, R.S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R.J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping and encounter outcomes. *Journal of Personality and Social Psychology, 50:* 992-1003.

Geerts, E., Bouhuys, N. (1998). Multi-level prediction of short-term outcome of depression: Non-verbal interpersonal processes, cognitions and personality traits. *Psychiatry Research, 79:* 59-72.

Goodwin, R.D., Gotlib, I.H. (2004). Gender differences in depression: the role of personality factors. *Psychiatry Research, 126:* 135-42.

Grossi, A., Ahs, A., Lundberg, U. (1998) Psychological correlates of salivary cortisol excretion among unemployed men and women, *Integrative Physiological and Behavioral Science 33*: 249-263.

Gunthert, K.C., Cohen, L.H., & Armeli, S. (1999). The role of neuroticism in daily stress and coping. *Journal of Personality and Social Psychology, 77:* 1087-1100.

Hair, E.C., Graziano, W.G. (2003). Self-Esteem, Personality and Achievement in High School: A Prospective Longitudinal Study in Texas. *Journal of Personality, 71 (6):* 971-994.

Harkness, K.L., Bagby, R.M., Joffe, R.T., & Levitt, A. (2002). Major depression, chronic minor depression, and the Five-Factor Model of Personality. *European Journal of Personality, 16:* 271-281.

Hayes, N., & Joseph, S. (2003). Big 5 correlates of three measures of subjective well-being. *Personality and Individual Differences, 34:* 723-727.

Herman, J.P., & Cullinan, W.E. (1997). Neurocircuitry of stress: Central control of hypothalamic-pituitary-adrenocortical axis. *Trends in Neuroscience, 20*, 78-84.

Holahan, C.J., & Moos, R.H. (1987). Personal and contextual determinants of coping strategies. *Journal of Personality and Social Psychology, 52:* 946-955.

Hu, C., Cui, Z., Dai, X., Chen, X., Gao, B., Hou, Y., Guan, Y. (2002). Coping style, mental health status, and personality of policemen. *Chinese Mental Health Journal, 16:* 642-643.

Jessop, D.S. (1999). Stimulatory and Inhibitory Regulators of the Hypothalamopituitary-adrenocortical Axis. *Bailliere's Clinical Endocrinology and Metabolism, 13: 491-501.*

Jimmieson, N.L., Terry, D.J., Callan, V.J. (2004). A longitudinal study of employee adaptation to organizational change: the role of change-related information and change-related self-efficacy. *Journal of Occupational Health Psychology, 9:* 11-28.

John, O. P., Donahue, E. M., & Kentle, R. (1991). The Big Five Inventory: Versions 4a and 54. Technical report, Institute of Personality and Social Research, University of California, Berkeley.

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), Handbook of personality: Theory and research (2nd ed., pp. 102-138). New York: Guilford.

Lawrence, J.W., Fauerbach, J.A. (2003). Personality, coping, chronic stress, social support and PTSD symptoms among adult burn survivors: a path analysis. *Journal of Burn Care and Rehabilitation, 24*: 63-72.

Lazarus, R.S. (1993). Coping theory and research: Past present, and future. *Psychosomatic Medicine, 55:* 234-247.

Lazarus, R.S., & Alfert, E. (1964). Short-circuiting of threat by experimentally altering cognitive appraisal. *Journal of Abnormal and Social Psychology, 69:* 195-205.

Lazarus, R.S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer.

Lazarus, R. S., Opton, E. M., Nomikos, M. S. & Rankin, N. O. (1965). The principle of short-circuiting of threat: further evidence. *Journal of Personality, 33:* 622-635.

Leucht, S., Wada, M., & Kurz, A. (1997). Are negative cognitions symptoms of depression or do they also reflect personality dimensions? *Nervenarzt, 68:* 563-568.

Matheson, K., & Anisman, H. (2003). Systems of Coping Associated with Dysphoria, Anxiety and Depressive Illness: A Multivariate Profile Prospective. *Stress – The International Journal on the Biology of Stress, 6:* 223-234.

Matheson, K. & Cole, B. (2004). Coping with a threatened group identity: Psychological and neuroendocrine responses. *Journal of Experimental Social Psychology, 40:* 777-786.

McCabe, M.P., McKern, S., McDonald, E. (2004). Coping and psychological adjustment among people with multiple sclerosis. *Journal of Psychosomatic Research, 56:* 355-361.

McCrae, R.R. (1989). Age differences and changes in the use of coping mechanisms, *Journal of Gerontology, 44:* 161-169.

McCrae, R.R., & Costa, P.T. (1986). Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality, 54(2):* 385-405.

McEwen, B.S. (2001). Plasticity of the hippocampus: adaptation to chronic stress and allostatic load. *Annals of the New York Academy of Sciences, 93(3):* 265-277.

McWilliams, L.A., Cox, B.J., & Enns, M.W. (2003). Mood and anxiety disorders associated with chronic pain: an examination in a nationally representative sample. *Pain, 106,* 127-133.

Meaney, M.J. (2001). Maternal care, gene expression, and the transmission of individual differences in stress reactivity across generations. *Annual Review of Neuroscience, 24:*1161-1192.

Ortony, Clore, & Collins (1988). *The Cognitive Structure of Emotions.* Cambridge, England: Cambridge University Press.

Pape, K.T., & Arias, I. (1995). Control, coping, and victimization in dating relationships. *Violence and Victims, 10:* 43-55.

Park, C.L., Armeli, S., Tennen, H. (2004). The daily stress and coping process and alcohol use among college students. *J Stud Alcohol, 65:* 126-135.

Paunonen, S.V. (2003). Big Five Factors of Personality and Replicated Prediction of Behaviour. *Journal of Personality and Social Psychology, 84:* 411-424.

Paykel, E.S. (2001). Continuation and maintenance therapy in depression. *British Medical Bulletin, 57:* 145-159.

Penley, J.A., Tomaka, J., & Wiebe, J.S. (2002). The Association of Coping To Physical and Psychological Health Outcomes: A Meta-Analytic Review. *Journal of Behavioral Medicine, 25 (6):* 551-603.

Priel, B., & Shahar, G. (2000). Dependency, Self-Criticism, Social Context and Distress: Comparing Moderating and Mediating Models. *Personality and Individual Differences, 28:* 515-525.

Raikkonen, K., Matthews, K.A., Flory, J.D., Owens, J.F., Gump, B.B. (1999). Effects of optimism, pessimism, and trait anxiety on ambulatory blood pressure and mood during everyday life. *Journal of Personality and Social Psychology, 76(1):*104-13.

Rascle, N., & Irachabal, S. (2001). Mediators and moderators: theoretical and methodological implications in stress and health psychology research. *Travail Humain, 64(2): 97*-118.

Ratsep, T., Kallasmaa, T., Pulver, A., Gross-Paju, K. (2000). Personality as a predictor of coping efforts in patients with multiple sclerosis. *Multiple Sclerosis, 6(6):* 397-402.

Ravindran, A.V., Anisman, H., Merali, Z., Charbonneau, Y., Telner, J., Bialik, R.J., Wiens, A., Ellis, J., Griffiths, J. (1999). Treatment of primary dysthymia with group

cognitive therapy and pharmacotherapy: clinical symptoms and functional impairments. *The American Journal of Psychiatry, 156 (10):* 1608-1617.

Ravindran, A.V., Matheson, K., Griffiths, J., Merali, Z., & Anisman, H. (2002). Stress, coping, uplifts, and quality of life in subtypes of depression: a conceptual frame and emerging data. *Journal of Affective Disorders, 71(1-3):* 121-130.

Rector, N.A., Hood, K., Richter, M.A., & Bagby, M.,R. (2002). Obsessive-compulsive disorder and the five-factor model of personality: distinction and overlap with major depressive disorder. *Behaviour Research and Therapy, 40 (10):* 1205-1219.

Reynolds, S.K., & Clark, L.A. (2001). Predicting Dimensions of Personality Disorder from Domains and Facets of the Five-Factor Model. Journal of Personality, 69 (2): 199-222.

Robinson-Whelen, S., Kim, C., MacCallum, R.C., Kiecolt-Glaser, J.K. (1997). Distinguishing optimism from pessimism in older adults: is it more important to be optimistic or not to be pessimistic? *Journal of Personality and Social Psychology, 73(6):* 1345-53.

Sapolsky, R.M., Romero, M., & Munck, A.U. (2000). How do Glucocorticoids Influence Stress Response? Intergrating Permissive, Suppressive, Stimulatory and Preparative Actions. *Endocrine Reviews, 21 (1): 55- 89.*

Scheier, M.F., Carver, C.S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4(3):* 219-247.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67, 1063-1078.

Schommer, N.C., Kudielka, B.M., Hellhammer, D.H. & Kirschbaum, C. (1999). No evidence for a close relationship between personality traits and circadian cortisol rhythm or a single cortisol stress response. *Psychological Reports, 84:* 840-842.

Segal, Z.V., Whitney, D.K., & Lam, R.W. (2001). Clinical guidelines for the treatment of depressive disorders. III. Psychotherapy. Canadian Journal of Psychiatry, 46(suppl. 1): 298-378.

Shahar, G., Joiner, T.E. Jr., Zuzoff, D.C., & Blatt, S.J. (2004). Personality, interpersonal behavior, and depression: co-existence of stress-specific moderating and mediating effects. *Personality and Individual Differences, 36*: 1583-1596.

Skinner, N., Brewer, N. (2002). The dynamics of threat and challenge appraisals prior to stressful achievement events. *Journal of Personality and Social Psychology, 83(3)*: 678-92.

Spangler, G., Pekrun, R., Kramer, K., & Hofmann, H. (2002). Students' Emotions, Physiological Reactions, and Coping in Academic Exams. *Anxiety, Stress and Coping, 15*, 413-432.

Stone, A.A., Neale, J.M. (1984). Effects of severe daily events on mood. *Journal of Personality and Social Psychology, 46(1):* 137-144.

Stowell, J.R., Kiecolt-Glaser, J.K., & Glaser, R. (2001). Perceived Stress and Cellular Immunity: When Coping Counts. *Journal of Behavioral Medicine, 24 (4):* 323-339.

Terry, D.J. (1994). Determinates of Coping: The Role of Stable and Situational Factors. *Journal of Personality and Social Psychology, 66 (5):* 895-910.

Tennen, H., & Affleck, G. (1998). Three compulsions of stress and coping research: A systems framework cure? *Psychological Inquiry, 9:* 164-168.

Terry, D., J. & Hynes, G., J. (1998). Adjustment to a low-control situation: Re-examining the role of coping responses. *Journal of Personality and Social Psychology, 74 (4):* 1078-1092.

Trull, T. J., & Geary, D. C. (1997). Comparison of the Big-Five Factor Structure Across Samples of Chinese and American Adults. *Journal of Personality Assessment, 6:* 324-341.

van den Heuvel, N., Smits, C.H., Deeg, D.J., Beekman, A.T. (1996). Personality: a moderator of the relation between cognitive functioning and depression in adults aged 55-85? *Journal of Affective Disorders, 41(3):* 229-240.

Vickers, R.R.Jr., Hervig, L.K., Poth, M., & Hackney, A.C. (1995). Cortisol secretion under stress: Test of a stress reactivity model in young adult males. *US Naval Health Research Center Report, 95-17 :* 1-34.

Vitaliano, P.P., DeWolfe, D.J., Maiuro, R.D., Russo, J.R., & Katon, W. (1990). Appraised Changeability of a Stressor as a Modifier of the Relation Between Coping and Depression: A Test of the Hypothesis of Fit. *Journal of Personality and Social Psychology, 59 (3):* 582-592.

Vollrath, M. (2001). Personality and Stress. *Scandinavian Journal of Psychology, 42(4)*: 335-47.

Vollrath, M., Alnaes, R., Torgersen, S. (1996). Differential effects of coping in mental disorders: a prospective study in psychiatric outpatients. *Journal of Clinical Psychology, 52(2):* 125-135.

Walsh, J.J., Wilding, J.M., Eysenck, M.W. and Valentine, J.D. (1997). Neuroticism, locus of control, Type A behaviour pattern and occupational stress. *Work and Stress, 11,* 148-159.

Watson, D., & Clark, L. A. (1997). Extraversion and its positive emotional core. In R. Hogan, J. Johnson, & S. Briggs, (Eds.), *Handbook of personality psychology* (pp. 767-793). NY: Academic Press.

Williams, P. G., O'Brien, C. D., & Colder, C. R. (2004). The effects of neuroticism and extraversion on self-assessed health and health-relevant cognition. *Personality and Individual Differences*, 37, 83-94.

Wolfenstein, M., & Trull, T.J. (1997). Depression and Openness to Experience. *Journal of Personality Assessment, 69 (3):* 614-632.

Zakowski, S.G., Hall, M.H., Cousino-Klein, L., & Baum, A. (2001). Appraised control, coping, and stress in a community sample: A test of the goodness-of-fit hypothesis. *Annals of Behavioural Medicine, 23(3):* 158-165.